IASP Special Interest Group (SIG) on the Prevention of Intentional Pesticide Poisoning

Bibliography: Topic - Epidemiology

Objective: To examine the causes and mortality of poisoning in Tehran.

Methods: The 7000 poisoning cases referred to Loghman-Hakim Hospital in Tehran over six months in 1994 were evaluated retrospectively. Results: The overall female to male ratio was 1.8:1. Most poisonings occurred in the age range 2-6 y for children and 21-40 y for adults. Oral ingestion was the most common route of intoxication. In children, boys had a higher frequency of poisonings than girls. Most cases of children were referred to the hospital between 8 am and 8 pm. In adults referred to the hospital, there was little diurnal variation in poisoning presentations. In adults, drugs were the most common cause of intoxication (60.2%). Of these, benzodiazepines (24.5%) were the most frequent, followed by antidepressants (20.5%) analgesics (18%). Pesticide and opiate poisonings were also commonly observed. In children, after drugs (32.1%), hydrocarbons were the most frequent cause of poisoning (19.2%). Pesticide poisonings were most often fatal (19.2%), followed by barbiturates (18.6%) and opiates (16.2%). Organophosphate insecticides were responsible for 57% of total pesticide poisoning cases. Of the deaths, 87.5% were attributed to suicide. Conclusion: The majority of poisoning cases in adults occur intentionally and in children accidentally.


Objective: To determine the causes and mortality of poisoning due to pesticides and to assess the effects of variables such as age, season, sex and agent on poisoning frequency in Tehran. Methods: A total of 700 pesticide poisonings cases including those admitted to Loghman-Hakim Hospital (n=635) or called to the Drug and Poison Information Center (n=65) in Tehran over an 18-month period from April 1, 1995 to September 21, 1997 were reviewed. Results: The overwhelming majority of subjects (644 of 700, 92%) were adults. Thirty-six percent were 20-30 years old and 95% of the events were intentional poisoning with the remainder being accidental, occupational, or criminal cases. The most common route of pesticide exposure was by ingestion followed by dermal exposure and inhalation. There were seasonal variations of poisoning events with a higher frequency in the Spring (39%) and in Summer (35%). Severity was considered mild in 60%, moderate in 27% and severe in 13% of cases. The overall mortality was 7%. Sweating, slow pulse, nausea, vomiting, abdominal pain and respiratory difficulties were the most common clinical signs and symptoms. The majority of cases (55%) were hospitalized for one day. In all ingestions, gastric lavage was usually performed as the first procedure in hospital management, while ipecac syrup was never employed. Conclusion: Organophosphates are the main cause of pesticide poisoning and pesticide-related deaths in Iran.

A prospective autopsy study addressing fatal poisoning with agricultural and horticultural pesticides was undertaken in Jordan over a 4 year period. A total number of 140 deaths occurred during 1999-2002. The mean fatality rate was 0.68 case per 100,000 population and the age range was 2-55 years; mean 28.3 years with male to female ratio 1.03. The largest number of cases occurred in those 20-29 years (n=69, 49.3%) followed by the age group 30-39 years (n=34, 24.3%) and 40-49 years (n=17, 12.1%). Less than 3.0% of the total fatal poisoning was noticed in both children younger than 9 years of age and those in the age group 50-59 years, with no fatal poisoning in adults at the age 60 years and above. At least 64.3% of all pesticide fatalities were due to suicide with male: female ratio (1.37:1). Accidental and homicide poisoning resulted in 24.3% and 7.9% of the total fatalities, respectively; however, only five cases 3.6% of fatal poisoning were due to unknown pesticides. The main pesticide used was carbamates with 110 cases 78.6% followed by organophosphorus 23 cases 16.4%. The study showed that the present legislation on pesticides availability in Jordan failed to reduce the number of fatal pesticides poisoning since the number of fatal pesticides poisoning was increased from 25.3 to 35 cases per year over a 20 years period. Enforcement of a new legislation addressing the availability of agricultural and horticultural pesticides for self-harm, especially carbamates and organophosphorus, is the most important strategy in the long term to prevent fatal pesticides poisoning in Jordan.


BACKGROUND: Knowledge concerning the epidemiology of suicide in Sri Lanka is limited despite its suicide rates being amongst the highest in the world. AIM: To examine the characteristics of a large sample of Sri Lankan suicides to inform approaches to prevention. METHOD: Psychological autopsy study of suicides occurring in three rural districts of Sri Lanka during August-October 1997. RESULTS: Interviews were conducted with contacts of 372 (74%) of the 499 suicides that occurred over the study period. Males accounted for 79% of the deaths. Twenty-one percent of male and 57% of female suicides were aged <25 years of age. Pesticide self-poisoning accounted for 259 (70%) of the deaths. Almost two-thirds (62%) of the deaths occurred in hospital and 95 (26%) had made previous suicidal gestures. 138 (37%) were moderately or severely depressed and 144 (49%) of male suicides, but only 2 (2.5%) of the females, were alcohol dependent. Illegally brewed alcohol (kasippu) was the main product used by two thirds (62%) of problem drinkers. There was a family history of suicide in 20% of cases. CONCLUSION: Pesticide self-poisoning accounts for over two thirds of suicides in rural Sri Lanka. Suicide prevention efforts in Sri Lanka should focus on restricting access to pesticides, improving the medical management of pesticide poisoning, reducing alcohol misuse-particularly targeting the supply of illegal alcohol-and improving the identification and aftercare of people who self-harm.

OBJECTIVES: Poisoning by means of hazardous chemicals through ignorance, mishap or intentionally is becoming a serious health problem worldwide. Epidemiological data on this important health issue are, however, scarce in Ethiopia. The purpose of this study is to assess the pattern of acute poisonings and determine the approaches employed for the management of poisoning. PATIENTS AND METHODS: The medical records of patients with acute poisonings presented to the Gondar University hospital between July 2001 and June 2004 were reviewed retrospectively. RESULTS: One hundred and two patients presenting to the emergency department of the hospital were due to acute poisoning; accounting for about 0.45% of emergency room admissions. Organophosphates, rat poison and alcohol were the commonly encountered poisoning agents (in about 70% of cases) mainly in adults possibly with suicidal or para-suicidal intention. The approaches employed in the management of poisoning mainly involved gastrointestinal decontamination procedures. Specific antidotes were used in a substantial number of patients. The fatality rate was 2.4%. CONCLUSION: Poisoning with suicidal intention is becoming a serious health problem particularly in adults. Pesticides are commonly used toxicants. The approaches in the management of poisoning are justifiable in some cases. However, much is to be done to improve the recording of patient-related information and record-keeping processes. Further large scale studies are required to investigate national trends of poisoning and factors associated with poisoning.


Objective: Epidemiologic data on acute chemical poisonings in Azerbaijan Republic is very limited. 1. The purpose of this pilot study was to evaluate and analyze the rate and characteristics of acute chemical poisoning cases in Azerbaijan. Methods: This investigation was performed on the data of poisoned patients admitted to the Republican Toxicology Center of the Ministry of Health of Azerbaijan in Baku city from 1st January to 31st December, 2007. Results: There were 1182 hospitalizations in the Republican Toxicology Center's (RTC) intensive care unit. 65.3% of patients were admitted to RTC within 2 hours of exposure. The mean length of hospitalization was 3.2 days. The youngest patient was ten days old and the oldest 82 years old. Acute intoxications were more frequent among males (51.4 %) and in 20-40 age group. The majority of patients (84.4%) were urban inhabitants. Pharmaceuticals were the most common cause of poisonings (31.9%). Among the pharmaceutical drug poisonings psychotropic medicines (45.6%) were the most frequent. The other cases of poisonings were inhalation of gases (14.6%); corrosives (14.9%); pesticides (3.3%); hydrocarbons (1.5%); alcohol (4.2%); opiates (4.2%); snake and spider bites (5.7%); mushrooms (0.4%) and others (19.3%). The most frequent cause was accidental poisoning (56.9%), followed by intentional and occupational poisonings. The mortality rate was 3.1%. Corrosive liquid (especially - concentrated acetic acid) poisonings were the most frequent cause of fatalities (40.5% of total mortality). Conclusion: These data provide
preliminary epidemiological information about acute chemical poisoning cases in the Azerbaijan Republic. Further research is required.


BACKGROUND: The recently published WHO guidelines on applications of ICD-10 to deaths during pregnancy, childbirth, and the puerperium (ICD-MM) aimed at enabling a comprehensive framework for international comparison of maternal deaths, which includes maternal suicides as a direct cause of maternal deaths. At present, most developing countries do not include suicide as a maternal death. METHODS: We extracted and analysed data from the maternal death surveillance system in North Central Province of Sri Lanka for the period of 2005 to 2011, in order to identify the implications of this new classification on maternal mortality estimates. All reported deaths of pregnant women and women within 12 months of termination of pregnancy were included in this study. Causes of deaths were extracted and coded using ICD-10 reclassified according to new ICD-MM for maternal deaths. RESULTS: Of the 118 deaths analysed, the maternal death investigation system had classified 53 (44.9%) deaths as maternal deaths. These 53 maternal deaths included one death due to suicide, out of 21 (17.8%) suicide deaths among 118 reported deaths. Application of the new ICD-MM showed 83 maternal deaths which resulted in a 56.6% increase of number of maternal deaths in the province. Detailed analysis of all individual causes by ICD 10 codes showed that intentional self-poisoning by an exposure to pesticide (ICD code X63) as the leading cause of maternal deaths in NCP (n = 11, 13.3% of all maternal deaths) during this period. The estimated MMR in the study area based on the new classification in years 2009, 2010 and 2011 was 115, 103 and 88 per 100,000 live births respectively. CONCLUSIONS: The new classification system may have an immediate effect in raising maternal mortality thresholds, making the MDG Goal 5A more elusive for many countries. However, this new approach may ultimately lead to a more accurate understanding of maternal mortality, as well as the real number of maternal deaths attributed to suicide. This more accurate accounting has implications for policymakers and practitioners globally as they strive to meet women's needs during pregnancy, including attention to detection and treatment for maternal depression, given its close correlation with maternal suicide.


To study acute organophosphorus (OP) poisoning cases, 190 OP-intoxicated cases admitted to Civil Hospital, Ahmedabad, were investigated in depth. The group consisted of subjects ranging from 11 to 60 years of age, with the maximum number of cases in the age group 21-30 years and a male-to-female ratio of 2.1:1. Most of the subjects (71.61%) were partially educated, 24.2% of the cases were illiterate, and only 4.2% of the cases were highly educated. Socioeconomically, 21.1% of the subjects were of low economic status, 52.6% were lower middle class, 16.8% were upper middle
class, and only 9.5% were upper class. With regard to marital status of the subjects, 98 cases were married and 92 were unmarried. About 67.4% of the cases had the intention of committing suicide, 16.8% of the cases were the result of occupational exposure, and 15.8% of the cases were from accidental poisoning. Social and domestic problems (37.5%), marital friction (15.8%), financial stress (15.6%), love affairs (14.1%), job problems (10.9%), chronic illness (4.7%), and failure in examination (1.6%) were observed as the precipitating factors. Muscarinic manifestations such as vomiting (96.8%), nausea (82.1%), miosis (64.2%), excessive salivation (61.1%), and blurred vision (54.7%) and CNS manifestations such as giddiness (93.7%), headache (84.2%), disturbances of consciousness (44.2%), and typical pungent odor from mouth and clothes (77.9%) were the main presenting symptoms. Cardiac manifestations such as sinus tachycardia (25.3%), sinus bradycardia (6.3%), and depression of ST segments with T-wave inversion (6.3%) were observed electrocardiographically, with hypertension (10.5%) and muscular twitching in some (2.1%) cases. Biochemical changes such as albuminuria (12.6%) and azotemia (18.9%) with inhibition of acetylcholinesterase enzyme activity in blood were recorded in 78.9% of the cases. About 89.5% of the cases recovered completely, 4.2% of the cases absconded after partial recovery, and 6.3% of the cases died. The mortality rate (6.3%) depended on various factors such as the organophosphorus compound consumed, the amount ingested, the time interval for hospitalization, and the general health of the patient. Chances of recovery were higher when the patient was hospitalized at the earliest indication.


OBJECTIVE: This study examined the prevalence and the characteristics of deliberate self-poisoning patients seen at the main general hospital in the Fiji Islands. METHOD: Thirty-one consecutive patients with deliberate drug-overdose and 27 others with nonoverdosed self-poisoning were compared on sociodemographic and clinical variables. RESULTS: Deliberate self-poisoning cases represented 0.3% of the hospital admissions, and had a rate of 25.9 per 100,000 population. The overdose group was significantly older (P<.05), whereas the poison-ingestion group had significantly greater proportion of males (P<.03). The rate of psychiatric morbidity was significantly higher in the overdose group (P=.04), whereas the history of alcohol abuse was significantly higher in the other group (P=.04). Paracetamol (35.5%) and paraquat (29.7%) were the most commonly used agents. CONCLUSIONS: Age, gender, rate of psychiatric morbidity, or history of alcohol abuse could be predictive of whether drug overdose or poison ingestion would be used for deliberate self-poisoning. This information could be relevant in the formulation of suicide preventive strategies.

Ahmadi, A., N. Pakravan, et al. (2010). "Pattern of acute food, drug, and chemical poisoning in Sari City, Northern Iran." Hum Exp Toxicol 29(9): 731-738. This descriptive and retrospective study was conducted at the poisoning ward of Imam teaching hospital, Sari, Iran, with the aim of evaluating the
pattern of poisoning. Hence, the medical profiles of 2057 patients, who were admitted, were carefully reviewed during the period from April 2006 to March 2008 for 2 years. During this period, 2057 cases, 53.9% female and 46.1% male, were admitted with the indication of acute poisoning. The greatest proportion of poisoning occurred between the ages of 18 and 29 years, with suicidal intentions. Most cases of poisoning were intentional (85%). The most common agents involved in acute poisoning were drugs (77.7%), especially sedatives/hypnotics such as benzodiazepines, followed by opioid analgesics. Organophosphate and carbamate insecticides were the third major agent that induced poisoning. Twenty-seven patients (1.3%) who were mostly females and young adults died. Death mostly occurred due to organophosphate and carbamate insecticides (19 cases) poisoning, followed by sedatives/hypnotics like benzodiazepines (3 cases). High prevalence of intentional overdose and mortality among young adults requires considerable attention and further studies to find out the underlying causes. In addition, strict rules must be followed regarding the sale of central nervous system drugs and pesticides, particularly organophosphate and carbamate insecticides. Establishing poison information centers in different parts of the country, preparing national treatment guidelines, training healthcare providers, and ensuring easy availability of the antidotes are also recommended.


The objective of this study is to define the etiological and demographical characteristics of the patients applying to the emergency department in Faculty of Medicine, Cukurova University because of poisoning. This retrospective study was carried out by examining the records of 491 people who applied to the main emergency department in Faculty of Medicine, Cukurova University, with the complaint of poisoning between January 1, 2004 and December 31, 2004. It was determined that the reason why 491 of 20 817 persons (2.4%) applied during this term was because of poisoning; 159 (32.4%) of such patients were male and 332 of them (67.6%) were female. It was found that the average age of men was 27.1 +/- 10.5 years and that of women was 24.4 +/- 9.5 years (P = 0.005); 427 of poisoning cases (87.0%) happened intentionally as suicide attempts and 64 of them (13.0%) were accidental. The rate of suicide-purposed poisoning was higher in women and the rate of unintentional poisoning was higher in men (P +/- 0.001). The drugs were accountable for 71.1% of all poisoning cases and the pesticides were accountable for 18.8% of such cases. Poisonings increase during summers. The mortality rate in poisonings was found as 0.8%. The drugs and pesticides in Ckurova region constitute 90.0% of all poisoning cases. The mortality rate in poisoning will be decreased by training the physicians employed in the emergency department about poisoning by drugs and pesticides.


CONTEXT: Poisoning is a common cause for attending emergency department of hospitals. AIMS: To explore the epidemiological characteristics and clinical profile of patients presenting with poisoning in emergency department. SETTINGS AND DESIGN: Prospective, cross-sectional, hospital-based study. MATERIALS AND METHODS: Relevant epidemiological and clinical data from patients, presenting with history/clinical features of poisoning in emergency department of a tertiary care district hospital in India, were collected and analyzed. STATISTICAL ANALYSIS: DATA ANALYSIS WAS DONE BY USING DESCRIPTIVE AND INFERENTIAL STATISTICAL METHODS: Frequency, percentage, mean, and standard deviation (SD). A two-tailed P < 0.05 was considered to be statistically significant. RESULTS: A total of 4,432 patients with history and clinical features of poisoning were included in the study. The females clearly outnumbered male patients. Poisoning with suicidal intent was more frequent (81.08%) than accidental (18.92%) (P < 0.0001). Majority of the patients were housewives followed by farmers, businessmen, laborers, and students. The mean time interval between poison consumption and admission to hospital was 6.4 hours (Mean +/- SD: 6.4 +/- 2.29). Snakebite (31.90%) was the most common cause of poisoning followed by organophosphorus compounds (21.84%), rodenticide (16.49%), alcohol (13.80%), chemicals (9.04%), and drugs (2.3%). The mean GCS (Glasgow Coma Scale) score of the poisoned patients at presentation was 8.85 +/- 1.62. Of all the patients included in the study, 3,712 patients (83.76%) survived and 720 patients (16.24%) expired. CONCLUSIONS: The current piece of work suggests that most of the poisoning cases involved young age group particularly females. Snakebite and organophosphorus compounds contributed most of the poisoning cases which calls for urgent government initiatives for improvement in proper lighting of the district to prevent snakebite and controlled use of pesticides.


OBJECTIVE: To examine the clinical epidemiology, including case fatality and determinants of self-harm in six island blocks of the Sundarban region of West Bengal, India. METHODS: We examined the clinical records of 1277 patients admitted for deliberate self-harm (DSH) to the six island hospitals from 1999 to 2001. RESULTS: 77.7% of the patients survived their attempt, 11.9% died and for 10.4% the outcome was not recorded. Women accounted for 65.2% of the DSH admissions and 67.1% of the deaths. Pesticides were the most commonly used means (88.7%). The case fatality of self-harm reported in these hospitals ranged from 6.0% to 50.0% (mean 13.3%; CI, 11.3-15.3). The age group 55-64 years was at highest risk of death, the age group 15-24 years at lowest risk. Higher lethality of pesticide ingestion compared to other methods was suggestive but not significant. Case fatality within the region varied but was high compared to industrialized nations. Case records and management of DSH were poor. CONCLUSION:
Effective DSH prevention in the Sundarban region would require better surveillance at clinical facilities and an intersectoral approach, linking the agricultural interests of pesticide safety and mental health interests for preventing DSH.


The toxicological impact and intentional ingestion of pesticides are major public health concerns globally. This study aimed to estimate the extent of deliberate self-harm (DSH) and suicides (suicidal behaviour) and document pesticide practices in Namkhana block of the Sundaraban region, India. A cross-sectional study was conducted in 1680 households (21 villages) following a mixed random and cluster design sampling. The survey questionnaire (Household Information on Pesticide Use and DSH) was developed by the research team to elicit qualitative and quantitative information. The Kappa statistic and McNemar's test were used to assess the level of agreement and association between respondents' and investigators' opinions about safe storage of pesticides. Over five years, 1680 households reported 181 incidents of suicidal behaviour. Conflict with family members was the most frequently reported reason for suicidal behaviour (53.6%). The Kappa statistic indicated poor agreement between respondents and investigators about safe storage of pesticides. The pesticide-related annual DSH rate was 158.1 (95% CI 126.2-195.5), and for suicide it was 73.4 (95% CI 52.2-100.3) per 100,000. Unsafe pesticide practice and psychosocial stressors are related to the high rates of suicidal behaviour. An intersectoral approach involving the local governments, agricultural department and the health sector would help to reduce the magnitude of this public health problem. 2013 Sohini Banerjee et al.


The ingestion of organophosphates in attempted suicide causes a very severe intoxication due to the slowness of the elimination of the substances ingested, which always gives rise to respiratory complications due to bronchial hypersecretion, bronchospasm and respiratory paralyses. The 2 cases reported here illustrate the necessity of prolonged monitoring because of the major risk of retarded acute respiratory insufficiency; of course, this monitoring should be clinical, but the electromyographic controls constitute a new aid of prime importance for the indication and stopping of assisted respiration.


Intentional self-poisoning is one of the most common methods of suicide worldwide. A three year retrospective hospital record-based research conducted in a tertiary care hospital attached to a medical institution in Karnataka to record the incidence, age, gender, religion, type of poisoning, outcome and circumstance of poisoning. Of the total 1, 49, 454 patients
admitted in the hospital for treatment during this three year research period, 592 patients were for to acute poisoning, among which 377 are of intentional self poisoning. Of these 57.5% were males and 42.5% females. The majority (36.6%) cases were from age group of 21-30 years. Majority (96.8%) of the intentional self poisoning victims were Hindus. The commonest poisons ingested were Organophosphorous insecticides. The mortality outcome was 60 out of 377 cases. Psychiatric illness was seen in 182 (48.3%) intentional self poisoning victims.


The authors analysed 69 cases of acute poisoning with pesticides (occupational, accidental and suicidal) treated at the Toxicology Centre in Poznan (Poland) in the years 1966-1975. Certain epidemiological data and clinical findings in various groups of pesticides in relation to their chemical structure are discussed. It was found that most treated poisonings (57%) were intentional, their course was very severe and death was frequent. Occupational poisonings (29%) were usually mild and a lethal outcome was infrequent. Favourable result of treatment was obtained in 90% of the cases. Most cases occurred in rural areas (84%). It was noticed that the preparation Gramoxone (Paraquat) had a high toxicity, which is usually inadequately stressed in the Polish literature. After exposure to derivatives of chlorophenoxy carbonylic acid damage to central nervous system was observed although these agents are regarded as relatively safe and included in 3rd toxicity class. Diagnostic difficulties in the initial period of intoxication with halogen derivatives are stressed. They are due to a lack of rapid laboratory methods and similarity of symptoms and signs of this poisoning to other diseases, particularly those of the nervous system. Conclusions regarding prevention of pesticide poisoning are proposed. (19 references)


We calculated mortality rates and years of life lost because of unintentional injuries and suicides using community based information obtained prospectively over a 7-year period, from 1998 to 2004, among a rural and peri-urban population of 108,000 in South India. Per 100,000 population the total mortality rate for unintentional injuries and suicides combined was 137.1, with 54.9 for unintentional injuries and 82.2 for suicides respectively. Hanging and self-poisoning with pesticides were the preferred means of suicide. Unintentional injuries and suicides resulted in 26.9% of total life years lost over the study period while 18.9% of all deaths in the population were attributable to unintentional injuries and suicides in the same period. The high burden is particularly notable in the 15-29 age group, where up to 70% of years of life lost are due to injury. The burden of injuries reported in this study is significantly higher than the figures reflected in available reports for India and is likely due to the under reporting in routine mortality statistics, particularly of suicides. 2006 Blackwell Publishing Ltd.

INTRODUCTION: Pesticides are the second major cause of poisoning in Brazil, but information about the chemicals involved and the clinical management of patients is scarce. METHODS: This study is a retrospective review of 709 pesticide cases reported to a toxicological information center from 2004 to 2007. RESULTS: Over 90% of the cases occurred after accidental or self-poisoning; more than 60% of the accidents involved children up to 4 years old, mainly with domestic pyrethroid insecticides. One hundred ninety-four cases involved chambinho, an illegal rodenticide known to contain acetylcholinesterase inhibitor insecticides, mainly aldicarb. In about half the cases, the individuals were admitted to hospitals. Those poisoned with acetylcholinesterase inhibitors stayed longer and most of them displayed pronounced clinical signs of poisoning (Poisoning Severity Score grades 2-4); 14 of the 18 deaths reported occurred with these products. Atropine was given to about 30% of the individuals, including to some with no cholinergic symptoms or exposed to non-acetylcholinesterase inhibitors. All 81 poisonings with coumarin were asymptomatic, but in half of the cases the individuals received vitamin K. CONCLUSIONS: The lack of laboratory support to confirm the chemical involved in the poisonings certainly contributed to the unnecessary antidote administration. In spite of continuing government efforts, poisoning with chambinho is still a major problem in the country.


OBJECTIVE: The aim of this prospective study was to analyze the rate and characteristics of acute poisoning cases admitted to adult intensive care unit (ICU). METHODS: All cases of acute poisoning admitted to ICU of the Harran University Hospital, Turkey, between July 2002 and May 2005, were included in this study. Clinical, laboratory, and demographic characteristics, type of poison and patient's outcomes were recorded. RESULTS: There were 86 poisoning cases among 844 patients admitted to the ICU. The mean age was 26 +/- 9 years and the majority of the patients (56.9%) were 15-24 years of ages. Eighty percent of acute poisonings were self-inflicted and 65.2% of these patients were singles. Medical drugs overdose were the major cause (51.2%) of intoxication followed by agricultural chemicals (37.2%). The most frequently involved medicinal drugs were benzodiazepines, antidepressants and analgesics. Eleven patients in pesticides-rodenticides and 9 patients in other medical drugs poisoning have required mechanical ventilation between 1-12 days. The duration of the intensive care stay was 6.4 +/- 4.3 days. Five cases (5.8%) with acute poisonings were fatal. CONCLUSION: There was a high rate of suicides attempt in young singles, predominantly female population. These data were the highest agricultural activity of the country that provide important information about the characteristics of poisoning at the city.

64 patients admitted to Kandy General Hospital, Sri Lanka, following 'self-poisoning' were interviewed. The sample resembled those from Western countries in that a major cause was inter-personal disputes, but differed from the West in that the disputes were mainly between patient and kin. Other differences were that social isolation was not a cause, agricultural pesticides were the commonest poisons used, relatively few patients were referred for psychiatric advice, and recidivism was very infrequent. An attempt is made to explain the differences on a socio-cultural basis.

OBJECTIVE: Pesticide self-poisoning accounts for one-third of suicides worldwide, but few studies have investigated the national epidemiology of pesticide suicide in countries where it is a commonly used method. We investigated trends in pesticide suicide, and factors associated with such trends, in Taiwan, a rapidly developing East Asian country. METHODS: We conducted an ecological study using graphical approaches and Spearman's correlation coefficients to examine trends in pesticide suicide (1987-2010) in Taiwan in relation to pesticide sales, bans on selected pesticides, the proportion of the workforce involved in agriculture and unemployment. We compared pesticide products banned by the Taiwanese government with products that remained on the market and pesticides that accounted for the most poisoning deaths in Taiwan. RESULTS: Age-standardised rates of pesticide suicide showed a 67% reduction from 7.7 per 100,000 (42% of all suicides) in 1987 to 2.5 per 100,000 (12% of all suicides) in 2010, in contrast to a 69% increase in suicide rates by other methods. Pesticide poisoning was the most commonly used method of suicide in 1987 but had become the third most common method by 2010. The reduction was paralleled by a 66% fall in the workforce involved in agriculture but there was no strong evidence for its association with trends in pesticide sales, bans on selected pesticide products or unemployment. The bans mostly post-dated the decline in pesticide suicides; furthermore, they did not include products (e.g. paraquat) that accounted for most deaths and were mainly restricted to selected high-strength formulated products whilst their equivalent low-strength products were not banned. CONCLUSIONS: Access to pesticides, indicated by the size of agricultural workforce, appears to influence trends in pesticide suicide in Taiwan. Targeted bans on pesticides should focus on those products that account for most deaths.

BACKGROUND: Pesticide self-poisoning is the most commonly used suicide method worldwide, but few studies have investigated the national epidemiology of pesticide suicide in countries where it is a major public health problem. This study aims to investigate geographic variations in pesticide suicide and their impact on the spatial distribution of suicide in Taiwan. METHODS: Smoothed standardized mortality ratios for pesticide suicide (2002-2009) were mapped across Taiwan's 358 districts (median
population aged 15 or above = 27 000), and their associations with the size of agricultural workforce were investigated using Bayesian hierarchical models. RESULTS: In 2002-2009 pesticide poisoning was the third most common suicide method in Taiwan, accounting for 13.6% (4913/36 110) of all suicides. Rates were higher in agricultural East and Central Taiwan and lower in major cities. Almost half (47%) of all pesticide suicides occurred in areas where only 13% of Taiwan's population lived. The geographic distribution of overall suicides was more similar to that of pesticide suicides than non-pesticide suicides. Rural-urban differences in suicide were mostly due to pesticide suicide. Areas where a higher proportion of people worked in agriculture showed higher pesticide suicide rates (adjusted rate ratio [ARR] per standard deviation increase in the proportion of agricultural workers = 1.58, 95% Credible Interval [Crl] 1.44-1.74) and overall suicide rates (ARR = 1.06, 95% Crl 1.03-1.10) but lower non-pesticide suicide rates (ARR = 0.91, 95% Crl 0.87-0.95). CONCLUSION: Easy access to pesticides appears to influence the geographic distribution of suicide in Taiwan, highlighting the potential benefits of targeted prevention strategies such as restricting access to highly toxic pesticides.


BACKGROUND: Pesticide poisoning is very common in Nepal. Hospital based studies from various parts of Nepal have shown that poisoning with organophosphorus compounds is the most common type of poisoning. Current study is undertaken to see the pattern of organophosphorus poisoning and to identify the common risk factors among the cases. If the risk factors are modifiable, attempts in addressing the risk factors and decreasing the likelihood of poisoning will certainly be fruitful in reducing the morbidity and mortality associated with organophosphorus poisoning.

OBJECTIVES: To assess the risk factors of organophosphorus poisoning which is major public health problem in Nepal. METHODS: A community based retrospective study of 75 cases of organophosphate poisoning who were brought to the emergency department of Dhalikhel hospital over the period of 3 years. Basic information was collected from hospital records and home visits were made to study the risk factors. Data were collected through interviews of the study population and their family members using a pre-designed questionnaire. RESULTS: In this study 75 cases and their families were interviewed of which there were 59% males and 42% females (M/F ratio of 1:1.4). The majority (40%) of the poisoning cases were in the age group 25-34 years. Lower literacy level showed positive association with the incidence of poisoning. Occupation wise vast majority (80%) of the cases were engaged in agricultural work. Suicidal attempts by ingesting organophosphate compounds were high in farmers and females.

CONCLUSION: In this study, majority of the poisoning were attempts of intentional self harm. Agriculture workers and females are high risk groups and may be associated with the fact that they have easy access to the poison. Interventions directed towards health education, counseling, and enforcement of laws restricting the availability and use of harmful pesticides may help in reducing such events in future.

OBJECTIVE: To seek the characteristics of pesticide poisoning in emergency departments. METHODS: Twenty-five hospitals were selected. Among them, they were 14 province or city level and 11 county level. The object of study was the patients with pesticide poisoning who were first visit to a doctor (including transfer to the above emergency departments of hospitals) from July 1, 2001 to June 30, 2002. RESULTS: There were 2 261 cases of pesticide poisoning that ranked third place of total acute poisoning cases at the same period. Gender ratio was 1 male to 1.47 female. Among 1 618 patients who first visited to emergency departments (excluding transfer), 43.9% were by emergency ambulance. 68.3% of total cases were caused by intentional exposure to pesticides, of which female accounted for 75.8%. Young people aged 15 to approximately 34 years accounted for 47.5% of all cases. Children (0 to approximately 14 years) also had relatively high pesticide poisoning rates, particularly an accident pesticide poisoning for 1- to approximately 4-year-old children accounted for 65.9% of total acute poisoning in the age group. 98.2% of all cases needed urgent medical treatment, and 52.4% were hospitalized. The leading occupation of patients was farmers followed by housekeepers, students and preschoolers. Insecticides poisoning accounted for 60.1% of all pesticides. The fatality rate in emergency department was 3.9%. 60.8% case was collected from county hospital. Pesticide poisoning rank first place of total acute poisoning cases in county hospital. CONCLUSION: A safety education of Knowledge Attitude Practice (KAP) is an effective measure for preventing pesticide poisoning.


OBJECTIVE: To investigate the case fatality proportion and associated factors in those carrying out suicide acts in Nantou, Taiwan. METHOD: Data from 1,171 suicide acts (including 973 with deliberate self harm and 198 completed suicides), identified between July 2000 and February 2003, were collected from a population suicide register in Nantou County, Taiwan. Case fatality proportion and the independent effects of demographic factors and suicide method on case fatality were investigated. RESULTS: The overall case fatality proportion was 16.9%, with higher proportions in men (26.3%) and in those aged 65 and over (37.9%). Hanging was the most lethal method (fatality proportion = 81.5%); pesticide was both commonly used and associated with a high case fatality (fatality proportion = 26.3%). Only age (increased with age) and suicide method were found to be independently associated with the risk of fatality. CONCLUSIONS: Suicide method and older age are independent predictors of the fatality of suicide acts. Suicide prevention strategy and clinical assessment ought to take into account of these two factors. Diminution of pesticide toxicity and control of access to pesticides are important considerations for suicide prevention in rural Taiwan.

**Background/Purpose:** Few studies have compared methods of suicide used by women in different countries. This study compared methods used by women in South Korea, Taiwan, Sweden and the United States. **Methods:** Age- and method-specific suicide rates for women in the four countries in 2002 were calculated and compared. Hanging, firearms and jumping from a height were classified as violent suicide methods. Poisoning suicides were further classified according to use of drugs, gases, pesticides and other agents. **Results:** Half of Taiwanese and American women used violent methods, while only one third of women in South Korea and Sweden used such methods. Poisoning was the most often used suicide method by women in all four countries. About 90% of American and Swedish women used drugs. In contrast, almost half of women from Korea and Taiwan used pesticides. **Conclusion:** Different countries contrast greatly in the agents used in suicide by poisoning but not in patterns of violent methods used. 2009 Elsevier & Formosan Medical Association.


**BACKGROUND:** Deliberate self-harm is a challenging public health issue but there is a paucity of data on non-fatal deliberate self-harm in the literature. We aimed to understand the behaviour of deliberate self-harm, both fatal and non-fatal, in a primary care setting. **METHODS:** A year-long prospective study of all admitted patients of deliberate self-harm at 13 block primary health centres of the Sundarban region was done to examine the sociodemographic profile and clinical outcome of suicidal behaviour. Data were collected by using an especially devised deliberate self-harm register. Each subject was administered a 20-item case history sheet by trained medical officers and nursing staff. **RESULTS:** A total of 1614 deliberate self-harm subjects (619 men, 995 women) were admitted during the year, of whom 143 (62 men, 81 women) died. Although women, especially in the younger age groups, constituted the majority of subjects (61.6%), the fatality trend was higher among men than among women (10% v. 8.1%). Poisoning was the commonest (98.4%) method of self-harm, particularly using pesticides. Easy availability of pesticides was a risk factor. Psychosocial stressors, such as conflict with spouse, guardian or in-laws, failed love affairs and economic distress, were the common underlying reasons. The majority of acts of deliberate self-harm (92.6%) were committed inside the home, especially by women. Only a small proportion of subjects had a past or family history of attempt at deliberate self-harm. The overall incidence of fatal and non-fatal deliberate self-harm was 5.98 and 61.51 per 100 000 population, respectively. **CONCLUSION:** Both fatal and non-fatal pesticide-related deliberate self-harm is a major public health issue in the Sundarban region. An intersectoral approach involving primary health, administration and agriculture may help in developing an effective preventive programme to reduce the morbidity and mortality from deliberate self-harm.

BACKGROUND: Deliberate self-poisoning by ingesting pesticides is a serious health problem among farmers, especially in low- and middle-income countries. Preventing these suicides is a priority for a public mental health agenda. OBJECTIVE: To examine the role of pesticide poisoning in suicide and nonfatal deliberate self-harm, and clarify awareness of risks, safe practices concerning storage and use of pesticides, and associated self-injury, both unintentional and intentional, within farmer households of the Sundarban region, India. METHODS: Retrospective record review of adult cases of deliberate self-poisoning at the Block Primary Health Centres of 13 Sundarban Blocks was performed to analyze the relative roles of various methods of self-harm and their lethality. Focus group discussions, questionnaires, and in-depth interviews were undertaken in a community study of farmer households to examine pesticide-related views and practices, with particular attention to storage, use, and health impact. RESULTS: Pesticide poisoning was the most common method of deliberate self-harm in both men and women. Pesticide storage in most households was unsafe and knowledge was inadequate concerning adverse effects of pesticides on health, crops, and the environment. CONCLUSIONS: An intersectoral approach linking the interests of public health, mental health, and agriculture is well suited to serve the collective interests of all three agendas better than each in isolation. Such an approach is needed to reduce morbidity and mortality from unintentional and intentional self-harm in low-income agricultural communities like those of the Sundarban region.


Objective: Deliberate self-poisoning with pesticides is a health problem in many middle and low-income agricultural countries. The Sundarban region of West Bengal, India is an agrarian area where pesticides are widely used in agriculture. During a previous cultural epidemiological mental health research in the region, the local community expressed concerns about suicidal behaviour, i.e., both non-fatal (referred to as deliberate self-harm or DSH) and fatal (suicide), particularly with pesticides. A programme of community mental health services was developed to combine research, clinical services, and interventions to study and prevent suicidal behaviour in the region. The present study reports on findings from the pilot survey of a coastal village of the Namkhana block of the Sundarban region. Materials and Methods: A household survey (n=214) was conducted in the Laxmipur Abad village of Namkhana block. A survey schedule (Household Information on Insecticide Use and DSH) was designed to elicit any event of suicidal behaviour in the households during the last five years. Results: A total of 15 DSH (46.7% male and 53.3% female) and 3 suicides were reported. The mean age of male DSH patients was higher (27.25 + 9.22 years) than their female (21.71 + 5.55 years) counterparts. Pesticides were the most common agent used in self-harm by both, male DSH (42.9%) and suicide (66.7%) patients. Hanging was more frequently reported among women DSH patients (50%). Family
quarrel was implicated as the reason in most of the DSH attempts (71.4% male, 50% females) and suicides (66.7%). The rates for DSH and suicide for the year 2001 were 728.9/100,000 and 355.9/100,000 respectively for the Laxminpur Abad village. Conclusion: Suicidal behaviour is a serious public health problem in the Sundarban region. Pesticides were the most common agent used for self-harm. A joint activity involving health service and local agriculture sector should address a DSH prevention programme. Community psychosocial intervention and farmers' education on safe pesticide practices is most suitable approach for reducing morbidity and mortality of self-harm particularly with pesticides in the region. 2005 Japan International Cultural Exchange Foundation.


Objective: Reducing suicide rates by preventing deliberate self-harm is a major concern for community-based mental health policy and programmes. Deliberate self-harm (DSH) by ingestion of pesticides is a frequent phenomenon in agricultural communities. This study examined patterns of morbidity and mortality over a five-year period (1995-1999) associated with DSH and their geographical distribution in Sagar Island of the Sundarban region of West Bengal, India. This study seeks to examine the relationship between DSH and availability of pesticide. Materials and Methods: Retrospective and prospective DSH data collection from the indoor admissions of a rural hospital of Sagar Island. Results: During this period there were a total of 488 cases (180 male and 308 female) of deliberate self-harm by ingestion of toxic substances ascertained from hospital admissions to the Sagar Rural Hospital, Rudranagar, where all such admissions on the island are treated. Among these, 16 males and 48 females died, indicating a higher fatality rate for women (15.6% compared with 8.9%). Demographic features and characteristic familial and other social stressors were also studied. DSH was found to be more frequent in areas where betel leaf vine is the predominant cash crop. Young females were the most frequent demographic group by age and sex to present for treatment of DSH in the government health clinics. Typical stressors included family quarrels, marital discord, dowry-related conflict, and broken love affairs. Conclusion: DSH by agrochemical poisoning is a serious public health issue in the Sundarban islands. Proper attention is called for to how recognition of ecological factors and typical social stressors may indicate ways of reducing morbidity and mortality from DSH in the context of a community mental health programme.

The newly established Poison information centre (PIC) at Department of Clinical Pharmacy, JSS College of Pharmacy, located at JSS Medical college hospital, Mysore, Karnataka, India provides poison information services to healthcare professionals and general public. The PIC is effectively functioning since September 2010. The prospective study was conducted
over a period of one year to assess the patterns of poison information queries received by PIC. A total of 348 poison information queries were received and answered during the study period. Of the total queries received, majority of queries were from doctors (75.5%) followed by health care professionals and public. Majority of the queries (82.2%) were received from healthcare facilities. A total of 34.5% queries were related to know the management of poisoning. Most of the queries were for better patient care (74.1%) and the information was provided verbally for majority of the queries (72.4%). For most of the poisoning queries (62.9%) the information was provided immediately. Significantly (p<0.001) majority of queries asked were related to intentional (suicidal) poisoning (66.5%) followed by accidental (23.2%) and environmental poisoning (5.8%). Majority of queries were related to poisoning from pesticides (44%) followed by medicines (26.1%), household products (15.8%) and bites and stings (10.1%). Intentional poisoning was most common in adolescents and adults (n=241; 69.2%) whereas accidental poisoning was the common in paediatric (0-12 years) population (n=56; 16.0%) which attained statistical significance (p < 0.001).


Background. Acts of suicide differ widely in the amount of planning preceding the act. Correlates of completed suicide in China identified in a previous investigation were re-examined to identify those that may be especially relevant to low-planned (impulsive) and high-planned suicidal behavior. The association of planning and method in completed suicide was also assessed.

Method. A psychological autopsy study of 505 suicide decedents aged > 18 years sampled to be representative of suicides in China was conducted. Multinomial regression analyses compared three levels of suicide planning (low, intermediate, high). Results. Women and younger individuals were more likely to carry out low-planned and inter-mediate-planned than high-planned acts of suicide. Greater acute stress distinguished low-planned from high-planned suicides. Ingestion of pesticides stored in the home was a more commonly employed method in low-planned than high-planned suicides. Conclusions. Low-planned suicides are more common in women, in younger individuals, and among those who are experiencing acute stress. Prevention strategies targeted at restricting access to pesticides may preferentially lower the rate of low-planned suicides. 2005 Cambridge University Press.


OBJECTIVES: To estimate the cumulative incidence rate of acute pesticide poisoning in the year 2000 among Nicaraguan subjects over 15 years of age.

METHODS: Data on pesticide exposure and health effects were assessed in a nationally representative survey. Based on self-reported cases, we estimated the 1-year incidence rate and the number of expected cases of acute pesticide poisonings in Nicaragua. RESULTS: Among the 3169 survey respondents, we identified 72 persons who self-reported one episode of acute pesticide poisoning in 2000. Of these, 65 cases (90%) were related to occupational exposure, five (7%) to domestic exposure and two (3%) to
intentional exposure. The cumulative incidence rate/100 individuals of pesticide poisonings in Nicaragua in 2000 was 2.3 (95% CI 1.7 to 2.8). This corresponds to 66 113 cases (95% CI 51 017 to 81 210). The highest rate was found among males in rural areas, particularly among farmers and agricultural workers. CONCLUSION: This study demonstrates an extremely high risk of acute pesticide poisoning in Nicaragua. Considering this, comprehensive measures should be implemented to reduce adverse health effects.


Objectives: The study aims to determine the incidence of suicide attempt, describe the methods used, and assess use of health care services including mental health care after suicide attempt in a rural area of Vietnam. Methods: All suicide attempters (104) during 2003-2007 were listed, diagnosed and re-evaluated by trained physicians according to the research criteria of the WHO Multicentre Study of Attempted Suicide. All attempters were interviewed by trained medical staff to investigate methods used, socio-demographic characteristics and use of health services. Results: The yearly incidence was 10.2 per 100000 person-years, 10.6 per 100000 in males and 9.8 per 100000 in females. 99% of cases committed suicide attempt by poisoning, 62.6% by pesticides and 36.3% by pharmaceutical drugs. 34.3% reported having been in contact with somatic care and 13.2% had received mental health care. Among those who reported some treatment received, 47.5% had been in contact with official health care services, 8.1% had pharmacy keepers' consultation or were treated by traditional healers and 4% reported self treatment. Conclusion: The incidence of suicide attempt was lower in this population compared to other settings. While the majority of attempters use pesticides, many had used psychotropic drugs. Contact with mental health services following the attempt was very limited in this setting. Suicide prevention for this high risk group should focus on reducing access to pesticides and psychotropic drugs. Mental health services should be made more accessible in rural areas. 2010 Nguyen et al; licensee BioMed Central Ltd.


Background. The global burden of clinical toxicology suggests a natural partnership with public health. This article reflects the content of a Louis Roche lecture given in 2010. Historical context. Our practice and research in clinical toxicology has evolved from clinical cases to toxico-epidemiology to public health. This evolution in practice was initially unplanned but gained momentum and impact as we placed it more formally in a public health framework. This perspective is implicit in Louis Roche's call to "examine all aspects of the poisoning problem" and still provides a valuable starting point for any clinical toxicologist. Discussion. Clinical toxicology has always had a patient centered focus but its greatest successes have been related to public health interventions. Our early failures and later success in pubic health
toxicology correlated with our understanding of the importance of partnerships outside our field. The most rapid dissemination and implementation of information derived from research occur through a priori partnerships with other agencies and international partners. Conclusion. Addressing both local and global need has a number of bilateral synergies. Repositioning clinical toxicology into a public health framework increases access to strategic partnerships, research funds, and policy implementation while still addressing questions that are important to clinical practice. 2011 Informa Healthcare USA, Inc.


Mortality resulting from agrochemicals met within the Office of the Judicial Medical Officer, Colombo, which is the premier Medico-legal Institute in Sri Lanka, are analysed over a 3-year period and the morbidity and mortality rates of the entire country are examined over a 10-year period. The number of patients admitted to hospitals in Sri Lanka during the period 1975-1983, stood at around 11,000-15,000 each year, with the year 1983 recording 16,649 admissions. The number of deaths during the same period varied from 900 to 1500 each year, while the year 1983 recording 1521 deaths. About 75% of such cases of poisoning were due to self ingestion while accidental and occupational poisoning formed the balance. Principal agricultural districts like Kurunegala, Jaffna, Vavuniya, Nuwara Eliya and Badulla recorded the highest incidence of poisoning. The mortality figures of the Office of the J.M.O., Colombo, indicated that 4% of all bodies subjected to autopsy were those of agrochemical poisoning. The male/female ratio was 2:1. Seventy-five percent of deaths from agrochemical poisoning were recorded in the 15-39 year age group, while 33% of deaths belonged to the 20-24 age group. One third of cases of agrochemical poisoning were dead on being brought to hospital, while 50% were dead within 2 h and 60% dead within 24 h. Organophosphates accounted for 57.6% of all cases of agrochemical poisoning, while paraquat accounted for 21.2% of cases. Deaths were also reported from what are called safe chemicals like Carbamatess and Pyrethrums due to their lethal additives.


**OBJECTIVE:** To explore if recent changes in methods of self-harm in Sri Lanka could explain the decline in the incidence of suicide. **METHODS:** Time series analyses of suicide rates and hospitalization due to different types of poisoning were carried out. **FINDINGS:** Between 1996 and 2008 the annual incidence of hospital admission resulting from poisoning by medicinal or biological substances increased exponentially, from 48.2 to 115.4 admissions per 100,000 population. Over the same period, annual admissions resulting from poisoning with pesticides decreased from 105.1 to 88.9 per 100,000. The annual incidence of suicide decreased exponentially, from a peak of 47.0 per 100,000 in 1995 to 19.6 per 100,000 in 2009. Poisoning accounted for 37.4 suicides per 100,000 population in 1995 but only 11.2 suicides per 100,000 in 2009. The case fatality rate for pesticide poisoning decreased
linearly, from 11.0 deaths per 100 cases admitted to hospital in 1997 to 5.1 per 100 in 2008. CONCLUSION: Since the mid 1990s, a trend away from the misuse of pesticides (despite no reduction in pesticide availability) and towards increased use of medicinal and other substances has been seen in Sri Lanka among those seeking self-harm. These trends and a reduction in mortality among those suffering pesticide poisoning have resulted in an overall reduction in the national incidence of accomplished suicide.


The objective of this study was to examine current organophosphate usage in Zimbabwe. A cross-sectional descriptive study was done to determine the trends in admissions for organophosphate poisonings in an urban Zimbabwe hospital from 1995 to 2000. Variables such as sex, age, season, geographic area, and intent were examined. In 183,569 records, 599 cases of organophosphate poisoning were found. Organophosphate poisonings increased by 320% over the six years. The male and female admissions’ rates were similar (48% vs 52%); 82% of the patients were less than 31 years old. Suicide was the predominant reason for poisoning (74%). Of admissions of children under the age of 10, 62% were due to accidental ingestion. Mortality from organophosphate poisonings was 8.3% over the six years. Organophosphate poisoning is increasing rapidly. In the background of this alarming trend is the physical, mental, and social state of a Zimbabwean society wrought with hardships.


In an attempt to identify at risk individuals, we analysed available information for individuals who committed suicide in Blantyre, Malawi. A retrospective audit of suicides autopsied at the Queen Elizabeth Central Hospital and the University of Malawi College of Medicine mortuaries between January 2000 and December 2003 was analysed by age, sex, residential location, and mode of suicide. Eighty-four suicide cases (65 males, 19 females) represented 17% of all autopsies. The major mode of suicide in Blantyre was chemical poisoning using an agricultural pesticide, accounting for 66 cases (79%) - 49 males (76%), 17 females (89%). There were no cases of poisoning by therapeutic medicines, self-immolation or incised wounds. The majority of cases were from one major urban area, Limbe, and one peri-urban area, Chileka. The demographics of suicide in Malawi differ from those reported for other African countries (e.g., lower proportion of females, no use of therapeutic medicine in poisoning, few gunshots). This audit highlights a need for investigations into the sale and use of agricultural pesticides. A prospective study of social and demographic factors around suicide should be undertaken to target groups at highest risk.


We investigated the epidemiology of intentional self-poisoning in rural Sri Lanka by prospectively recording 2189 admissions to two secondary
hospitals. Many patients were young (median age 25 years), male (57%) and used pesticides (49%). Of the 198 who died, 156 were men (case fatality 12.4%) and 42 were women (4.5%). Over half of female deaths were in those under 25 years old; male deaths were spread more evenly across age groups. Oleander and paraquat caused 74% of deaths in people under 25 years old; thereafter organophosphorous pesticides caused many deaths. Although the age pattern of self-poisoning was similar to that of industrialised countries, case fatality was more than 15 times higher and the pattern of fatal self-poisoning different.

Eddleston, M., A. Karunaratne, et al. (2006). "Choice of poison for intentional self-poisoning in rural Sri Lanka." Clinical Toxicology 44 (3): 283-286. Background. Although intentional self-poisoning is a major public health problem in rural parts of the Asia-Pacific region, relatively little is known of its epidemiology. We aimed to determine why Sri Lankan self-poisoning patients choose particular poisons, and whether acts of self-harm with highly dangerous poisons were associated with more premeditation and effort. Methods. We interviewed 268 self-poisoning patients presenting to two district general hospitals in rural Sri Lanka. Results. Eighty-five percent of patients cited easy availability as the basis for their choice of poison. There was little premeditation: more than 50% ingested the poison less than 30 minutes after deciding to self-harm. Patients had little knowledge about treatment options or lethality of the poison chosen. We found no difference in reasons for choice of poison between people ingesting different poisons, despite marked differences in toxicity, and between people who died and those who survived. Conclusions. Poisons were chosen on the basis of availability, often at short notice. There was no evidence that people using highly toxic poisons made a more serious or premeditated attempt. Restrictions on availability of highly toxic poisons in rural communities must be considered in strategies to reduce the number of intentional self-poisoning deaths in the Asia Pacific region. Copyright Taylor & Francis Group, LLC.

Fathei rahman, A. I., A. F. Ab Rahman, et al. (2005). "MS 04-044: demographic features of drug and chemical poisoning in northern Malaysia." Clin Toxicol (Phila) 43(2): 89-94. Acute poisoning is a significant health problem all over the world. In Malaysia, nationwide data on poisoning pattern is scarce and incomplete. The objectives of our study were to determine the pattern of acute drug and chemical poisoning at Penang General Hospital (PGH), in the northern region of Malaysia, and to compare poisoning characteristics between different ethnic groups. The study was a retrospective case review of all poisoned patients admitted to PGH during the years 2000-2002. We collected data concerning demographic parameters of patients, information about the agent(s) implicated, and circumstances surrounding the event. There were 493 poisoning incidents. Nearly two-thirds of the poisoned cases involved female patients. The predominant mode of poisoning was intentional (51.5%). The age group 15.1-30 years ranked at the top, constituting 55.2% of all cases. Drugs were the predominant agents implicated. Among cases associated with drugs, paracetamol was the main causative agent (44.7%). Chinese patients constituted 37.7% of all poisoning
cases, followed by the Indians (31.6%) and Malays (26.8%). Between ethnic
groups, Indian patients were found to have the highest rate of poisoning
admission of 75.2 per 100,000 persons.

country - The first year's experience." Human and Experimental Toxicology 9 (3):
161-163.
The National Poisons Information Centre (NPIC) in Sri Lanka was
established in January 1988. It received 353 enquiries in the first year of
which 37% concerned pesticide poisoning. More than half the instances were
of self-poisoning; consistent with the high suicide rate in the island. Over a
quarter of poisoning episodes were among 19-25 year olds. Follow-up of
enquiries showed 31 (9%) deaths. Collaboration with developed countries
helped in the formation of the NPIC, fulfilling a long felt need among doctors
in the island.

Fernando, R., M. Hewagama, et al. (2010). "Study of suicides reported to the
Several interventions reduced the suicide rate of 48.7 per 100,000 in 1995 to
23 per 100,000 in 2006, though it is still a major socioeconomic problem. All
suicides have to be reported to the Inquirer of Sudden Death (ISD) or
'Coroner', according to the Criminal Procedure Code. METHOD: All deaths
where a verdict of 'suicide' was given after an inquest at the Coroner's Court,
Colombo, in 2006 were studied. Close relations or friends who attended the
inquest were interviewed by medically qualified research assistants. Age,
sex, marital and occupational status, level of education, living circumstances
and method and reasons for the suicide were studied. RESULTS: During
2006, 151 deaths from suicide were documented, of which 93 (62%) were
men. The majority (47%) were aged between 20 and 29 years. One-third of
the victims was unemployed. At the time of committing suicide, 75% were
living with family; 89 (59%) were married and 46 (31%) were single.
Poisoning was the cause of death in 66 (44%), 48 (70%) of which were due to
pesticides. Burns caused 51 (34%) deaths. Other common causes of
death included hanging (11%), jumping in front of a train (7%) and drowning
(3%). The commonest reason for suicide was dispute with the spouse/marital
disharmony (30%). Other reasons were dispute with parents (8%), financial
matters (7%), organic diseases (7%), alcoholism (7%), psychiatric illnesses
(6%) and disputes in love affairs (5%). In 29 cases (19%), no definite reason
for the suicide was evident. DISCUSSION: Self-poisoning and
self-immolation were the commonest methods used to commit suicide.
Marital disharmony was the main reason (30%). Psychiatric illnesses were
responsible for only 6%. Future interventional activities should include secure
access and restriction of the availability of pesticides and drugs, empowering
people to manage anger and conflicts, and recognition and treatment of
alcoholism and psychiatric illnesses. The success story of the reduction in
the incidence of suicides in Sri Lanka should be a lesson to many developing
countries where suicide is a major socioeconomic and health issue.

BACKGROUND: The objective was to describe patients presenting themselves at emergency-care settings following a suicide attempt in eight culturally different sites [Campinas (Brazil), Chennai (India), Colombo (Sri Lanka), Durban (South Africa), Hanoi (Viet Nam), Karaj (Iran), Tallinn (Estonia), and Yuncheng, (China)]. METHOD: Subjects seen for suicide attempts, as identified by the medical staff in the emergency units of 18 collaborating hospitals were asked to participate in a 45-minute structured interview administered by trained health personnel after the patient was medically stable. RESULTS: Self-poisoning was the main method of attempting suicide in all eight sites. Self-poisoning by pesticides played a particularly important role in Yuncheng (71.6% females, 61.5% males), in Colombo (43.2% males, 19.6% females), and in Chennai (33.8% males, 23.8% females). The suicide attempt resulted in danger to life in the majority of patients in Yuncheng and in Chennai (over 65%). In four of the eight sites less than one-third of subjects received any type of referral for follow-up evaluation or care. CONCLUSIONS: Action for the prevention of suicide attempts can be started immediately in the sites investigated by addressing the one most important method of attempted suicide, namely self-poisoning. Regulations for the access to drugs, medicaments, pesticides, and other toxic substances need to be improved and revised regulations must be implemented by integrating the efforts of different sectors, such as health, agriculture, education, and justice. The care of patients who attempt suicide needs to include routine psychiatric and psychosocial assessment and systematic referral to professional services after discharge.


Suicide mortality in a Northern town of Sri Lanka for the year 1982 is examined. The rate was 52.5 per 100,000 general population and shows an increasing trend amongst the 15-34 age group. The commonest method was self-poisoning by agrochemicals and insecticides of organophosphorus type. Psychiatric diagnosis, social, economic and political factors are presented. Easy availability of dangerous agrochemicals and rapid social and political changes appear to be of equal importance in producing a high rate of suicide.


Different methods of poisoning used by individuals with the diagnosis of parasuicide admitted to the Loghman Hospital, Tehran, from 2000 to 2004 were investigated, with particular focus on gender and age differences. Drugs, pesticides, and other agricultural chemicals (women: 12.7%, men: 9%) were the most commonly used methods. In males, the percentage of use of drugs increased with age, but the frequency of pesticides use decreased with age. In females, drugs were most often used in the youngest age group, whereas the use of pesticides was lowest in the youngest age category. Females outnumbered males, especially in the youngest age group.
of 10 to 19 years old. Drugs and pesticides were the substances used most often for parasuicide in each age group regardless of gender.


Aim: The aim of this study was to analyze the epidemiological issues related to suicide in Ecuadorians. Subject and methods: This is an observational, descriptive, and epidemiological study. The data used in this study arise from the National Institute of Statistics and Censuses register. The study analyzed gender, sex, and method used in suicide and undefined cases. Results: Every year in Ecuador 801 individuals die by suicide, with a prevalence rate (PR) of 60.55 deaths per million population (pmp). Suicide is the cause of 1.4% of all deaths in Ecuador. By gender, men account for 70.96% (PR=42.49 pmp), while the percentage in women is only 29.04% (PR=17.58 pmp). The male to female ratio is ~2:1: 76.79% of all the cases involved individuals between 15 and 50 years of age. The most common method of suicide is hanging, strangulation, or suffocation (44.35%), followed by unspecified chemicals (20.37%) and pesticide poisoning (20.07%). Every year in Ecuador 352.6 individuals die by unspecified events or undetermined intents. These events could be a source of hidden suicides. By gender, men account for 76.39% (PR=20.35 ppm). The male to female ratio is ~3:1. Conclusion: Suicide in Ecuador has increased in a constant and progressive way, even though there is major underreporting of these cases. The main method to commit suicide was hanging followed by pesticide poisoning. Suicide prevalence rates were similar to neighboring countries in South America, with the exception of Uruguay. Unspecified events or undetermined intents could be a source of hidden suicides, a fact that needs further analysis. Springer-Verlag 2010.


Aim: This study was conducted to determine the biological effects of acute poisoning, the nature of agents involved and the pattern of poisoning in Diyarbakir City, in the Southeast Anatolian region of Turkey, during 2000. METHOD: Hospital records of all admissions to the Emergency Department (ED) of Dicle University Hospital following acute poisoning were revised and all data from January to December 2000 were analysed. The present study included 44 (25.9%) male (M) and 126 (74.1%) female (F), a total of 170 patients. The M/F ratio was 1.0/3.5. RESULTS: The mean age of patients was 23.3+/-.6.3 years; 63 (37.1%) of them were under 20 years of age and 147 (86.5%) were under 30 years of age. Most intoxication cases occurred during the summer season (93 of 170 patients). On a monthly basis, admissions during April, May and July were most common (24, 26 and 30 patients, respectively). Sixty-two (36.5%) cases involved accidental poisoning while 108 (63.5%) involved deliberate poisoning. In suicide attempts, intoxications were more common in females (77 cases, 71.3%, P < 0.05), and in unmarried persons (74 cases, 68.5%, P < 0.05). There were only two deaths (1.2%) among the 170 admissions of acute poisonings. One of the
deaths was due to pesticide poisoning and the other was due to medical drug abuse. Tachycardia (59, 34.7%), vomiting (55, 32.4%) and loss of consciousness (42, 24.7%) were frequently observed, whereas hypersecretion (15, 8.8%), bradycardia (5, 2.9%), convulsion (8, 4.7%) and hypertension (2, 1.2%) were less frequent. Among pesticide poisoning cases the incidence of convulsion (6, 10.2%), miosis (6, 10.2%), and hypersecretion (12, 20.3%) were significantly higher when compared to other cases (P=0.018, P <0.0001 and P <0.0001, respectively). CONCLUSION: In the Southeast Anatolian region of Turkey, pesticide intoxication is common especially among young, unmarried females and most of these intoxications are intentional self-poisonings. The annual rate of poisoning-related ED visits and mortality were found to be within expected ranges; psychoactive agents being the most common cause.


BACKGROUND: Evidence is accumulating that pesticide self-poisioning is one of the most commonly used methods of suicide worldwide, but the magnitude of the problem and the global distribution of these deaths is unknown. METHODS: We have systematically reviewed the worldwide literature to estimate the number of pesticide suicides in each of the World Health Organisation’s six regions and the global burden of fatal self-poisoning with pesticides. We used the following data sources: Medline, EMBASE and psycINFO (1990-2007), papers cited in publications retrieved, the worldwide web (using Google) and our personal collections of papers and books. Our aim was to identify papers enabling us to estimate the proportion of a country’s suicides due to pesticide self-poisoning. RESULTS: We conservatively estimate that there are 258,234 (plausible range 233,997 to 325,907) deaths from pesticide self-poisoning worldwide each year, accounting for 30% (range 27% to 37%) of suicides globally. Official data from India probably underestimate the incidence of suicides; applying evidence-based corrections to India’s official data, our estimate for world suicides using pesticides increases to 371,594 (range 347,357 to 439,267). The proportion of all suicides using pesticides varies from 4% in the European Region to over 50% in the Western Pacific Region but this proportion is not concordant with the volume of pesticides sold in each region; it is the pattern of pesticide use and the toxicity of the products, not the quantity used, that influences the likelihood they will be used in acts of fatal self-harm. CONCLUSION: Pesticide self-poisoning accounts for about one-third of the world’s suicides. Epidemiological and toxicological data suggest that many of these deaths might be prevented if (a) the use of pesticides most toxic to humans was restricted, (b) pesticides could be safely stored in rural communities, and (c) the accessibility and quality of care for poisoning could be improved.


All around the world, acute poisoning remain a major cause of hospital admission. The wide availability and easy accessibility to potentially toxic chemicals (which have wide spread use in medicine, industry, agriculture and
even in normal daily life) contribute to the ease with which the lay public can get their hands on lethal poisons.2. Poisoning has been used by man for murder and suicide as long as recording history, several modes of exposure may be recognized context with poisoning namely: i) accidental and suicidal poisoning which cannot be prevented through legislation or preaching ii) occupation exposure iii) by standing exposure resulting from off target drift iv) general public exposure who consume item containing pesticides residues.3. Incidence of poisoning, as reported is 13-fold higher in developing countries than in highly industrialized nation. 300,000 people die each year from pesticide self poisoning in the rural developing world.4. This is a pilot study conducted at Belgaum, North Karnataka to make preliminary assessment about poisoning cases etiologies. The aim of the study was finding out the common age group involved and mode of poisoning. Besides this it also attempts to relate with gender and their choice. The common age group involved is in between 21 to 30 years. Males are more likely affected by poisoning (53%) compared to female (47%). This study serves as pilot project for more detailed retrospective and prospective studies in the future.


OBJECTIVES: To carry out time series analyses of hospital admissions for poisoning between 1995-2008 in all districts in Sri Lanka to identify trends and geographical variations in the substances used in poisoning. METHODS: Data of hospital admissions from 1995-2008 due to poisoning were obtained from the Annual Health Bulletins published by the Ministry of Health. Data were converted to annual rates per 100,000 population. Time trends in the rates of suicide and self-poisoning were calculated using univariate time series analysis. RESULTS: All districts except Kilinochchi and Mullaitivu showed an increase in the rates of admissions due to poisoning with drugs, medicaments and biological substances. Colombo, Hambantota, Kalutara and Anuradhapura showed an exponential increase. Hambantota, Monaragala, Nuwara Eliya and Colombo show an increase in the rate of admissions after pesticide poisoning. All other districts showed a linear decrease. Admissions due to all types of poisoning showed a negative trend in Anuradhapura, Polonnaruwa, Ampara, Matale and Batticaloa districts. Other districts show a positive trend in the rate of admissions for all types of poisoning. CONCLUSIONS: Results should be viewed with caution because they are based on analysis of secondary data. Although the rate of suicides has reduced since 1995, admissions due to self poisoning have increased in almost all districts. While pesticide poisoning is becoming less, there is a gradual shift to the use of drugs and medicaments in self poisoning. Poisoning with drugs, medicaments and biological substances are increasing both in urban and rural areas.


OBJECTIVE: To study the epidemiology of acute poisoning patients presenting to an acute medical service ward in a Greek hospital between
January 1998 and December 2000. DESIGN: Prospective case series. RESULTS: A total of 273 patients with self-poisoning were included in the study. This represented 3.8% of the overall admissions to the unit. The mean age of patients was 33, the most frequent age group being that aged 20-30 years (36.2% of total) with a male-to-female ratio of 1:1.97. Sixty per cent of patients was admitted within 4 h. Those from urban areas comprised 76.2% and 23.8% from rural areas. The most frequently ingested agents were psychopharmaceuticals (37.4%) and analgesics/anti-rheumatics (32.6%). Pesticides (7.7% of total) were most frequently used by patients coming from rural areas (32.3% of patients from rural areas). Alcohol was included in the overdose in 8.4%. Of the patients, 16.2% had a previous history of overdose. In this case series, psychiatric assessment suggested that 52% of the patients had a formal psychotic diagnosis, 21% had personality disorder and 27% had taken an overdose in response to stress. The most frequently documented precipitating factors were family problems and disputes (37%). Unusually, the seasonal distribution in these patients suggested a peak in summer (37.5% of presentations) with lower numbers in spring (30.2%), autumn (17.7%) and winter (14.6%). Of the patients, 23.7% presented in July. A total of 73.5% of patients was conscious, 16.4% was somnolent, 4.5% was in precoma and 5.6% was in coma (GCS <8). Patients who received antidotal therapy comprised 17.9%. Evidence of hepatic dysfunction was observed in 8.9% of patients and renal dysfunction in 3.8%. Extracorporeal techniques for drug removal (hemodialysis and hemoperfusion) were used in 2.2% of patients. Intensive care therapy was required in 11.4% of patients. The mean overall hospitalization time was 3.3 days. The mortality rate was 2.9%. CONCLUSIONS: This study shows that the epidemiology of self-harm by overdose in Greece is significantly different in terms of the seasonal presentation from other parts of Europe. The agents ingested and other features are similar to northern Europe. Psychiatric diagnoses are more common in our group than in those reported from northern Europe.


BACKGROUND: Whereas German suicide rates had a clear decreasing tendency between 1991 and 2006, they increased from 2007 to 2010. Deeper analyses of suicide data might help to understand better this change. The aim of this study was to analyze 1) whether recent trends can be related to changes in specific suicide methods and diverge by gender and age; 2) whether the decrease of suicide rates before 2007 as well as the increase from 2007 to 2010 are driven by the same suicide method. METHODS: Analyses were based on suicide data from the Federal Statistical Office of Germany. For 1998-2010, 136,583 suicide cases of men and women with known age and suicide method could be identified. These data were analyzed by joinpoint regression analysis, allowing identification of the best fitting point in time ("joinpoint") at which the suicide rate significantly changes in magnitude or direction. RESULTS: The national downward trend between 1998 and 2007 was mainly due to corresponding changes in self-poisoning by other means than drugs (e.g., pesticides) (annual percentage change (APC) <= -4.33), drowning (APC <= -2.73), hanging (APC <= -2.69) and
suicides by firearms (APC <= -1.46) in both genders. Regarding the overall increase of age-adjusted suicide rates in Germany 2007-2010, mainly the increase of self-poisoning (e.g., by drugs) and "being overrun" (APC >= 1.50) contributed to this trend. LIMITATIONS: The true suicide rates might have been underestimated because of errors in the official death certificates. CONCLUSIONS: Increase in suicide rates in Germany since 2007 went along with corresponding changes for "being overrun" and "self-poisoning". Copycat suicides following the railway suicide of the goalkeeper Robert Enke partly contributed to the results. Thus, prevention of Werther effects and limitation of the availability of high pack sizes for drugs are of special relevance for the reversal of this trend.


OBJECTIVE: This observational study examined the outcome of Taiwanese pediatric patients with paraquat poisoning and compared these data with the published data on paraquat poisonings from other international poisoning centers. METHODS: We performed a retrospective study on children with acute paraquat poisoning that were admitted to the Chang Gung Memorial Hospital during a period of 10 years (2000-2010). Of the 183 paraquat poisoning patients, only 6 were children. RESULTS: The mean age was 8.85 +/- 5.55 (1-15.6) years. Younger patients had accidentally swallowed paraquat, whereas older patients had intentionally ingested paraquat. Most patients were referred within a relatively short period (0.5-2.0 hours). Paraquat poisoning was associated with high morbidity and often resulted in severe complications, including acute respiratory distress syndrome and multiple-organ failure. The complications included shock (50.0%), hypoxemia (33.3%), respiratory failure (33.3%), nausea/vomiting (16.7%), abdominal pain (33.3%), hepatitis (66.7%), gastrointestinal tract bleeding (33.3%), acute renal failure (33.3%), and seizures (16.7%). Patients were treated aggressively with a standard detoxification protocol consisting of gastric lavage, active charcoal, charcoal hemoperfusion, and cyclophosphamide and steroid pulse therapies. Secondary bacterial infections were common after hospitalization and included sepsis (33.3%), pneumonia (33.3%), and urinary tract infection (50.0%). In the end, 2 patients (33.3%) died from multiple-organ failure, despite intensive resuscitation. CONCLUSIONS: Our data (mortality rate, 33.3%) are comparable to the data of other published reports from other international poison centers. Evidently, a prompt diagnosis of paraquat poisoning and an immediate institution of a detoxification protocol is a prerequisite for a favorable outcome.


Poisoning represents one of the most common threats against public health. This population-based study was undertaken to identify potentially hazardous environmental factors for poisoning in Vietnam, and thereby to improve the background information needed to take adequate preventive measures. The study population comprised 3814 individuals from 942 randomly selected households in Phu Tho Province. Their mean age was 32.7 years, 50.4%
were male. Data collection methods included face-to-face interviews using a structured questionnaire, and reality observations following a structured checklist. Of the study population, 438 individuals (11.5%) recalled having suffered from at least one episode of symptomatic poisoning. The toxic agents most commonly involved in these incidents were pesticides (68.7%). Hazardous exposure to toxins was reported to occur frequently and pesticides were again the agents most commonly involved. The presence of insecticides and other pesticides in the home were common (39%) and 21.7% of studied households kept poisonous chemicals in places easily accessible to children. Nearly half the households kept medications at home, often without any medical safe-box. Fifty-six point two percent reported prescriptions were not necessary for purchasing pharmaceuticals. Common habits among household members put them at risk for poisoning by natural toxins. Among these, frequent use of unusual herbs, and the practice of raising and eating poisonous animals were most important. In conclusion, the widespread use of pesticides, risk for exposure to natural toxins and self medication constitute major hazards for poisoning in Vietnam. Effective control regulations and safe strategies are lacking.


In this study, the authors explored acute paraquat intoxication and determined potential factors related to paraquat fatalities. During 1999, 154 patients with paraquat intoxication were admitted to the Institute of Pesticide Poisoning at the Soonchunhyang University Chunan Hospital. The authors assessed paraquat exposure by quantifying the amount of ingested paraquat and by semiquantitative assay of paraquat in urine. Outcomes of paraquat intoxication were categorized as recovery or death. Among all the patients, 139 (90.3%) were transferred from other medical facilities to the Institute of Pesticide Poisoning following a mean exposure time of 20.1 hr (standard deviation = 2.6 hr). Intentional ingestion of paraquat accounted for 73.4% (113/154 patients) of all paraquat poisonings, and it represented a significantly higher fatality rate (53.2%) than did accidental ingestion (19.1% [p < .001]). The overall paraquat fatality was 43.8%. Multiple logistic-regression analysis revealed that the risk of fatality increased significantly with (1) the quantity of paraquat ingested and (2) a positive urinary paraquat test. The results indicated that paraquat is potentially lethal in humans, and the risk of fatality is directly related to the amount ingested and absorbed.


The aim of our study was to investigate the etiological and demographical characteristics of acute adult poisoning cases admitted to a university hospital in Tabriz, Iran. This retrospective study was performed on 1342 poisoning admissions to a university hospital from 2003 to 2005, by data collection from the medical records of patients. Poisonings were 5.40% of the total admissions. There was a predominance of female patients (55.7%) compared to male patients (44.3%) with a female-to-male ratio of 1.2:1. Most poisonings occurred in the age range of 11-20 years (38.9%). Drugs were the
most common cause of poisonings (60.8%). Among the drug poisonings, benzodiazepines (40.31%) were the most frequent agents, followed by antidepressants (31.98%). The seasonal distribution in poisoning patients suggested a peak in spring (28%) and summer (27.5%). In 9.8% of cases accidental and in 90.2% intentional poisonings were evident. Most suicide attempts were made by women (58.51%) and unmarried people (51.4%). The mean duration of hospitalization was 3.02 +/- 2.8 days. There were 28 (2.3%) deaths; the majority (13 cases) was due to pesticides. This was a university hospital-based study, so these results may not be representative of the general population. Despite this drawback, these data still provide important information on the characteristics of the poisoning in this part of Iran. To prevent such poisonings, the community education about the danger of central nervous system-acting drugs and reducing the exposure period of people to pesticides are recommended.


WHO reports estimate poisoning as one of the most common causes of increased morbidity and mortality rate world-wide. Various agents such as pesticides, drugs have been used for intentional and accidental poisoning in different countries. In the Indian scenario, pesticides are the most commonly used poisoning agents. To assess the prevalence and mortality incidence rate due to various poisoning agents a retrospective and prospective study conducted over a period of nine months in a tertiary care teaching hospital. Retrospective data of poisoning cases was collected from the medical records section and the prospective data of poisoning cases was collected from the emergency and causality departments. A total of 1045 poisoning related admissions were identified during the period January 2005 to September 2008. Among them, 68.40% of cases were due to intentional poisoning and 31.60% were due to accidental poisoning. Of the poisoning related admissions, 84.4% of patients recovered, whereas in 7.6% of cases condition did not improve. Mortality rate was observed 4%. Intentional poisoning was observed more in male population (60.2%) in the age group of 18-29 years. Accidental poisoning was seen more in children in the age group of 1-3 years. Incidence of overall poisoning cases were high due to pesticides (39.5%) followed by medicines (26.1%), household products (22.1%), environmental poisoning (12.1%) and heavy metals (0.2%). It was observed that availability of centralised poison information centre and treatment protocols will improvise poison management practices in tertiary care hospitals by the clinicians.


OBJECTIVE: To study the preventive strategies through analyzing the poisoning cases from the National Injury Surveillance System (NISS), from 2006 to 2008. METHODS: Data of poisoning cases was descriptively analyzed from Chinese NISS, from 2006 to 2008. RESULTS: The proportion of poisoning cases to all injuries cases from NISS were 2.57%, 2.48% and
2.52% from 2006 to 2008, which ranked sixth in all the injuries causes. Most people being poisoned had junior middle school education and most of them were agriculture/animal husbandry/fishery/water producers or commercial service personnel. Most of the poisoning incidents were happened at home, always occurred in leisure time - around 8 PM, every day. The common types of poisoning were alcohol, clinical drugs, pesticide and carbon monoxide. Unintentional injuries were the main causes. Self-harm/suicidal cases in the rural areas were more than in the urban areas, with women more than men. The main type of self-harm/suicide related poisoning cases were through drugs or pesticide. >= 65, 15 - 29 and 30 - 44 year-olds were most commonly seen. CONCLUSION: Alcoholism was the primary type of poisoning injuries which is the highest in young adults (15 - 29 years and 30 - 44 years). It's important to promote civilized drinking habits and limit access to alcohol for youth. Self-harm/suicide had close relationship with clinical drugs and pesticide. The key points to prevent pesticide and clinical drugs poisoning were safe storage of pesticides, universal security of pesticide, and the supervision on drug producing and marketing. Children and the elderly were the high risk people for carbon monoxide poisoning. Monitoring and intervention must be strengthened.


Abstract Background: Suicide attempts and suicides constitute a significant burden on communities and health systems, especially in low income countries. However, many low income countries lack epidemiological information on which to base future preventive strategies. This study reports on gender and age profiles as well as the likely background and means used for suicide attempts and suicides in Bolivia. Method: This study presents 1124 cases from four different sources of information; (i) emergency ward data with suicide attempts by poisoning from the year 2007, (ii) psychiatric ward data including suicide attempts from July 2011 to July 2012, (iii) newspaper articles reporting attempted suicides and suicides from 2009 to 2011, and (iv) the National Statistics on Crime reporting suicides from the years 2010-2011. Data on age was stratified into three age groups: adolescents aged 10-19 years, young adults aged 20-29 years, and older adults aged above 29 years. Data from the hospital wards and Crime Statistics were pooled to compare characteristics of suicide attempts with suicides concerning age and gender. Data on age, gender, methods used, and reasons were analyzed using IBM SPSS version 21. Results: Hospital data showed that more females (403/657, 61%) than males (254/657, 39%) attempted suicide, and females attempted suicide at a younger age than males (p<0.05). In contrast to this, more males (208/293, 70.5%) than females (85/293, 29.5%) committed suicide, and furthermore it was most prevalent among young adults aged 20-29 years of both genders, as observed from the Crime Statistics. The dominant method was pesticide poisoning varying from 400 out of 657 (70.5%) of the hospital poisoning cases to 65 out of 172 (37.8%) of the newspaper cases. Newspaper data showed a higher mortality rate (65/77, 85.1%) among those using violent methods such as hanging and jumping compared to non-violent methods (43
84, 50.9%) such as ingesting chemicals and drugs (p<0.05). The reasons were related to interpersonal problems, economic problems, depression, and unwanted pregnancies. Many cases of suicide seemed to be hidden due to cultural and religious reasons. Conclusion: More females attempted suicide, whereas more males realized suicide. Suicide attempts were most numerous among adolescents in contrast to suicides being most prevalent in the older age groups. Self-poisoning with pesticides was the most popular method used. Access to potential suicide materials should be restricted and psychosocial interventions initiated to prevent suicides.

Karalliedde, L. and N. Senanayaka (1988). "Acute organophosphorus insecticide poisoning in Sri Lanka." Forensic Science International 36 (1-2): 97-100. Records of 92 cases of acute organophosphorus (OP) insecticide poisoning were analysed. Of the patients 91% were under 30 years of age and 86% were males. The common agents were Dimethoate, Methamidophos, Malathion, Monocrotophos and Fenthion. Poisoning was due to ingestion with suicidal intent in the majority. In addition to the acute cholinergic features, the other important manifestations were delayed onset respiratory paralysis and delayed polynuropathy. The overall mortality was 18%.

Kastanaki, A. E., C. F. Kraniotis, et al. (2010). "Suicide by pesticide poisoning: findings from the island of Crete, Greece." Crisis 31(6): 328-334. BACKGROUND: The role of pesticides in suicidal acts has not yet received adequate attention in Greece despite an evident rise of 39% in pesticide use over the period 1990-1992 to 2002-2004. AIMS: To investigate the epidemiology of pesticide suicide on the Greek island of Crete, a largely rural agricultural area, and by further exploring the victim profiles, as well as patterns and trends of pesticide ingestion, to suggest probable preventive measures. METHODS: Self-poisoning suicides between 1999 and 2007 were reviewed and information gathered was entered into a computerized database. RESULTS: The overall incidence of intentional pesticide poisoning was 1.7 per 100,000, representing the second most frequently used suicide method after hanging. The victim profile was composed of the following features: middle aged male, rural habitant, who carried out a suicidal act by consuming primarily methomyl or parquat (WHO toxicity class Ib and class II, respectively). As to the place of death, the vast majority was found dead in the place of intoxication. CONCLUSIONS: Pesticide self-poisoning accounts for a quarter of the suicides in Crete. More detailed research is required to identify aspects of these deaths amenable to prevention, but measures such as bans on the most toxic pesticides and changes in storage practice would appear to be sensible initial approaches.

Kervegant, M., C. Schmitt, et al. (2013). "Self poisonings with parquat in French Guiana: Persistent use during suicidal behavior in French overseas territories. [French]." Annales de Toxicologie Analytique 25 (2): 71-73. Objective: Paraquat is a pesticide widely used around the world as herbicide. The toxicity of this molecule on human beings is high as it induces after ingestion liver and renal failure with possible delayed pulmonary fibrosis. After numerous reports about this major toxicity the European authorities decided to withdraw this herbicide of the market in July 2007. The authors
report a collective case of poisoning with paraquat in French Guiana in 2011. Method: A teenager boy and his mother ingested paraquat deliberately. Hepatic and renal failures were observed for the young male who was treated with the immunosuppressive protocol treatment in order to prevent the pulmonary complications. His mother rapidly developed multi-organic failure. Results: The young boy's hepatic and renal failure evolved quickly favorably. No respiratory disturbances were reported with him allowing a discharge after 16 days of hospitalization. His mother who ingested higher quantities of paraquat died in 2 days. Conclusion: This collective case proves that 4 years after the prohibition of paraquat in French Guiana it is still possible to observe life-threatening poisonings induced by such a dangerous herbicide. 2013 Societe Francaise de Toxicologie Analytique.


**OBJECTIVES:** Pesticide poisoning stands as a major public health issue worldwide. The objective of this study was to examine the epidemiologic characteristics of pesticide-related hospitalizations in South Korea.

**METHODS:** Data from the Korea National Hospital Discharge Survey were analyzed to describe the epidemiologic characteristics of pesticide poisoning among hospitalized patients from 2004 through 2006. Pesticide-related hospitalizations were identified using the International Classification of Diseases, Tenth Revision codes. National estimates of pesticide-related hospitalizations were calculated using sampling weights for number of hospitalizations. **RESULTS:** A total of 25,982 pesticide-related hospitalizations were estimated during the years 2004-2006, yielding an average annual pesticide-related hospitalization rate of 17.8 per 100,000 population in South Korea. Age-specific rates for pesticide-related hospitalization increased with age, with the highest rate noted among those aged 70 or above. The majority of pesticide-related hospitalization was cases of intentional poisoning in rural areas. Seasonal variation in the rate was observed, with summer being the highest among both men and women.

**CONCLUSIONS:** Pesticide-related hospitalization is prevalent and demonstrates demographic and seasonal and regional variations. More effective strategies to reduce pesticide-related hospitalizations are required in South Korea.


**BACKGROUND:** Suicide is a major public health concern. The elderly have the highest rate of suicide and they make more lethal suicide attempts and have fewer psychiatric interventions than young people. Furthermore, they have old-age specific psychosocial difficulties. The present study investigated psychosocial risk factors and characteristics of an index suicide attempt of the elderly suicide attempters. **METHODS:** Subjects included 388 patients who were admitted to the emergency room following self-poisoning. Two age groups were defined: younger patients (aged less than 65 years) and older patients (aged over 65 years). Data including demographic factors, suicidal risk factors and information about the current suicide attempt were
obtained from a retrospective chart review. RESULTS: The number of suicide attempters over the age of 65 years old was 57, and their mean age was 73.5 +/- 7.5 years. The elderly patients had more underlying medical illnesses than the under-65 group (p < 0.001). Depression was the most common psychiatric diagnosis. Psychotropics were the most commonly ingested drugs in both groups, but the use of pesticides was more notable in the elderly. The elderly suicide attempters had higher risk-rating scores (p < 0.001) and lower rescue-rating scores (p = 0.014) than the under-65 group. Male-to-female ratio of the elderly group was nearly 1:1 unlike the under-65 group (p = 0.004). CONCLUSION: Elderly suicide attempters had different psychosocial stressors such as physical illness and more lethal suicide attempts. Our study suggests the need for development of specific preventive strategies and management guidelines for the elderly suicide attempters.


OBJECTIVES: A study to investigate deliberate self-harm (DSH) in an African context was undertaken in Uganda. METHODS: A case-control study in which 100 cases of DSH and 300 controls matched on age and sex were recruited from three general hospitals in Kampala and subjected to a structured interview using a modified version of the European Parasuicide Study Interview Schedule I. RESULTS: Among the cases, 63% were males, with a male to female ratio of 1.7:1 and a peak age range of 20-24 years. Higher educational attainment, higher socio-economic class and poor housing were significantly associated with DSH. District of current residence, district of birth, religion, ethnicity, marital status, number of children, current living arrangement, area of usual residence, employment status of respondent and partner were not significantly associated with DSH. Pesticides and medications, mainly antimalarials and diazepam, were the main methods of DSH used. The most commonly reported psychiatric disorders were adjustment disorder, acute stress reactions and depression. CONCLUSION: DSH in Uganda appears to predominantly afflict the young. Disturbed interpersonal relationships, poverty and loneliness were important factors in the immediate precipitation of this behaviour. The fact that pesticide poisoning is still the predominantly used method in DSH in this area calls for a review of the legislation that controls the sale and availability of these agricultural chemicals.


Since they are available in open markets and pharmacies, pesticides have been widely used all over the country. (Un)intentional poisoning with these compounds is one of the most common causes of chemical poisoning, especially in rural agricultural areas. Pesticide poisonings reported by various countries showed that it is a worldwide health problem with 250,000-370,000 associated deaths each year. In this study, medico-legal deaths between the years 2001 and 2011 in Ankara and nearby cities in Turkey were investigated.
retrospectively. The autopsies were partly carried out by Ankara Branch of Council of Forensic Medicine. Data were collected from reports of the Morgue Department whose toxicological analyses were performed in the Chemistry Department. The data revealed that 70 cases out of 10,720 autopsied ones had been attributed to fatal pesticide poisoning. The age range was 1-80 years (mean +/- SD. 41.33 +/- 17.42 years). Most of the cases (60%) were reported from Ankara. Insecticides were the most common (94%) cause of fatal pesticide poisonings, most of them (63%) being organophosphate insecticides. The percentages of pesticide-induced deaths are quite high in our society and should therefore not be underestimated. Accordingly, intensive efforts to reduce occupational and intentional pesticide poisonings are urgently needed in Ankara and nearby cities.

Ko, Y., H. J. Kim, et al. (2012). "Emergency department visits due to pesticide poisoning in South Korea, 2006-2009." Clin Toxicol (Phila) 50(2): 114-119. OBJECTIVES: The objective of this study is to estimate the numbers and rate of emergency department visits in South Korea that are the result of pesticide poisoning and to describe their epidemiologic characteristics. MATERIALS AND METHODS: Data collected from the National Emergency Department Information System were used to estimate the number of emergency department visits due to pesticide poisoning in South Korea for the period spanning 2006 through 2009. Emergency department visits for pesticide poisoning were defined by ICD-10 codes (T60.0-T60.9). National estimates and their 95% confidence intervals were calculated per 100 000 population. RESULTS: Among the 65 877 total poisoning-related emergency department visits in the data, 11 985 (18.2%) were emergency department visits resulting from pesticide poisoning. During the study period, the annual average rate of emergency department visits for pesticide poisoning was 26.8 per 100 000 population. Intentional pesticide poisoning (51.4%) was more frequent than unintentional. The fatality rate from intentional pesticide poisoning was also higher than that from unintentional or cases where the intention was unknown. In terms of age-specific rates of emergency department visits for pesticide poisoning, they increased with age, as did the gap between men and women. CONCLUSIONS: This study provide estimates for emergency department visits due to pesticide poisoning at the national level and suggests that pesticide poisonings, both intentional and unintentional, require significant public health interventions in South Korea.


Acute poisoning with various substance is common everywhere. The earlier the initial resuscitations, gastric decontamination and use of specific antidotes, the better the outcome. The aim of this study was to characterize the poisoning cases admitted to the tertiary care hospital, Warangal district, Andhra Pradesh, Southern India. All cases admitted to the emergency department of the hospital between the months of January and December, 2007, were evaluated retrospectively. We reviewed data obtained from the hospital medical records and included the following factors: socio-demographic characteristics, agents and route of intake and time of admission of the poisoned patients. During the outbreak in 2007, 2,226
patients were admitted to the hospital with different poisonings; the overall case fatality rate was 8.3% (n = 186). More detailed data from 2007 reveals that two-third of the patients were 21-30 years old, 5.12% (n = 114) were male and 3.23% (n = 72) were female, who had intentionally poisoned themselves. In summary, the tertiary care hospitals of the Telangana region, Warangal, indicate that significant opportunities for reducing mortality are achieved by better medical management and further sales restrictions on the most toxic pesticides. This study highlighted the lacunae in the services of tertiary care hospitals and the need to establish a poison information center for the better management and prevention of poisoning cases.


BACKGROUND: Poisoning is a significant public health problem worldwide and is one of the most common reasons for visiting emergency departments (EDs), but factors that help to predict overall poisoning-related fatality have rarely been elucidated. Using 1512 subjects from a hospital-based study, we sought to describe the demographic and clinical characteristics of poisoning patients and to identify predictors for poisoning-related fatality. METHODS: Between January 2001 and December 2002 we prospectively recruited poisoning patients through the EDs of two medical centers in southwest Taiwan. Interviews were conducted with patients within 24 hours after admission to collect relevant information. We made comparisons between survival and fatality cases, and used logistic regressions to identify predictors of fatality. RESULTS: A total of 1512 poisoning cases were recorded at the EDs during the study period, corresponding to an average of 4.2 poisonings per 1000 ED visits. These cases involved 828 women and 684 men with a mean age of 38.8 years, although most patients were between 19 and 50 years old (66.8%), and 29.4% were 19 to 30 years. Drugs were the dominant poisoning agents involved (49.9%), followed by pesticides (14.5%). Of the 1512 patients, 63 fatalities (4.2%) occurred. Paraquat exposure was associated with an extremely high fatality rate (72.1%). The significant predictors for fatality included age over 61 years, insufficient respiration, shock status, abnormal heart rate, abnormal body temperature, suicidal intent and paraquat exposure. CONCLUSION: In addition to well-recognized risk factors for fatality in clinical settings, such as old age and abnormal vital signs, we found that suicidal intent and ingestion of paraquat were significant predictors of poisoning-related fatality. Identification of these predictors may help risk stratification and the development of preventive interventions.


Objectives: Paraquat poisoning by ingestion is often fatal. Most paraquat poisoning studies conducted in various countries were retrospective or simple collection of individual reports in prospective studies. Although all these data are not sufficient to understand overall paraquat poisoning, it is
helpful to compare epidemiological status between different countries or regions. In this study, we described epidemiologic status of paraquat poisoning in Korea, which was based on national prospective survey entitled 'Research on the actual state of pesticide poisoning in Korea and guidelines for diagnosis and treatment of pesticides poisoning'. Method: Research on the actual state of acute pesticide poisoning in Korea was conducted through 38 large hospitals nationwide from August 2005 to July 2006. Outcomes of paraquat intoxication were categorized as recovery or death. Results: Total 1,610 patients acutely intoxicated with pesticides. Of the 520 intoxicated patients with paraquat, male was 63.1% and the median age was 54 years. The incidence of paraquat poisoning was high between the ages of 40 and 69, and 98.0% of the poisoning occurred through oral route. Intentional poisoning accounted for 87.9% of paraquat poisoning and the proportion of adults older than 20 years was 99.0%. There was no accidental paraquat poisoning at all in patients less than 20 years old whose median age was 16.5 years. Most frequent clinical manifestations were nausea (32.9%) and vomiting (32.7%), followed by irritability (30.3%), confusion (19.4%), dyspnea (19.4%), sorethroat (17.7%). Overall fatality rate of paraquat was 73.5%. The fatality rates of paraquat poisoning increased with the amount ingested. The paraquat volume <5ml contributed 5.3% to the fatality, >5-10 ml 40.0%, >10-20 ml 51.4%, >20-40 ml 68.3%, >40-60 ml 81.3%, >60-100 ml 92.9%, >100-200 ml 95.1%, and >200 ml 100%. Conclusion: The overall paraquat fatality in Korea was 73.5%, which is similar with other countries or regions. The results indicated that paraquat is potentially lethal in humans, and the risk of fatality is directly related to the amount ingested and absorbed.


OBJECTIVES: Pesticide poisoning is a major cause of death in the world. The objective of this study was to examine the trends of pesticide poisoning deaths and their epidemiologic characteristics in South Korea. METHODS: We evaluated the age-standardized mortality rates from pesticide-related deaths (intentional self-poisoning, accidental poisoning, assault, undetermined intent poisoning) in South Korea from 1996 through 2005, using registered death data obtained from the Korea National Statistical Office. The regional rurality index was calculated and correlation analyses were used to estimate the association with pesticide poisoning mortality. RESULTS: The number of pesticide poisoning deaths from 1996 through 2005 was 25,360, which accounted for 58.3% of the total poisoning fatalities. The age-standardized mortality rates by pesticide poisoning significantly increased from 4.42 to 6.42 per 100,000 population, whereas the total death rate was decreased in the same period. Intentional self-poisoning was the majority cause of death from pesticides (84.8% of total pesticide poisoning deaths). The majority of the pesticide poisoning deaths were men, over 50 years old, with education less than middle school, and residing in rural areas. The rate of pesticide poisoning deaths was the highest in the farming period and was significantly correlated with the rurality index of each region. CONCLUSIONS: Pesticide poisoning deaths substantially increased during the 10-year study period, and showed demographic, seasonal and regional
variations. More intensive intervention efforts to reduce pesticide mortality should become a public health priority in South Korea.


OBJECTIVE: To analyze the characteristics of injuries between two types of Emergency Department (ED) in China. METHODS: We selected 25 hospital EDs in the whole country as spots for investigation, and designed one special questionnaire to collect information, from 1st July, 2001 to 30th June, 2002. RESULTS: In city hospitals (CIH), the proportion of injury to all diseases were 19.65%, and in country hospital (COH) it was 29.88%. The fatality rate of injuries was 1.29% in COH, which was higher than that of CIH's (P < 0.001). In COH, ambulance was more frequently used to treat injury patients than in CIH, but the average rescue time was not different. In cities, machinery was the leading cause (about 32.88%), but in country it was due to transport (35.34%). Traffic accidents, suicide/homicide and unintentional drowning were the main causes of death. In CIH, the number of unintentional poisoning was almost twice as intentional, but in COH the patients due to poisoning suicide act were more than unintentional poisoning, with 2/3 of the poisoning causes were women. Patients due to chemical, drug and food poisoning accounted for 86.13% in CIH, while in COH the main causes were pesticidal, chemical and druggery (89.80%). In all poison, pesticide was the leading cause for death. CONCLUSION: It's suggested that patients with injury be treated timely since the acute injury patients accounted for important part of ED's patients. The differences between CIH and COH were obvious, with better ability of treatment in CIH than in COH. More relevant measures were needed to improve the ability of acute treatment for injuries.


BACKGROUND: Pattern of acute poison exposure varies in the different areas. The information will be useful for prevention. OBJECTIVE: To evaluate pattern, severity and clinical outcome of acute poison exposure in the Emergency Department of a University Hospital in Thailand. MATERIAL AND METHOD: Medical records of all acute poison exposure cases, presented the Emergency Department of Thammasat University Hospital between October 1, 2006 and September 30, 2008 were reviewed retrospectively. Demographic characteristics, exposure time, agents, route and cause of exposure, clinical course and outcome were analyzed. RESULTS: Of the total 76,805 Emergency Department visits, 1112 cases were related to acute poison exposures, which were accounted for 1.4%. Sixty-five percents were female. Patients whom their ages ranging from 21 to 40 years old showed the highest rate of acute poison exposures. Intentional and unintentional exposures accounted for 52.7% and 44.9%, respectively. Intentional exposure was the major cause of exposure in the age group of 11-40 years, while unintentional exposure was the major cause of exposure in children. Pharmaceutical products (38.1%) were the most common category of substances involved in acute poison exposure followed by bites.
and stings (31.7%) and household products (17.6%). The substances most frequently involved were acetaminophen (17.7%) and toilet cleaning agents (12.3%). Fifty-six (5%) cases developed severe clinical course and three (0.27%) patients died. Pesticide and toilet cleaning agents were responsible for all these fatalities. CONCLUSION: Acetaminophen and toilet cleaning agents were commonly involved in acute poison exposure. Pesticide and toilet cleaning agents caused severe morbidity and mortality. Unintentional exposure was the major cause of exposure in children. Public education regarding the danger of these agents and prevention of the poison exposure in children should be emphasized.


BACKGROUND: Suicide rates vary widely across nations and ethnic groups. This study aims to explore potential factors contributing to inter-ethnic differences in suicide rates. METHOD: Study subjects came from a case-control psychological autopsy study conducted in Taiwan, including 116 consecutive suicides from two aboriginal groups and Taiwanese Han; 113 of them each matched with two living controls. Gender-, age- and method-specific suicide rates, population attributable fraction (PAF) of suicide for five major risk factors, help-seeking before suicide and emergency medical aid after suicide were compared between the three ethnic groups. RESULTS: One aboriginal group (the Atayal) had significantly higher adjusted rate ratios (RR) of suicide than the other aboriginal group (the Ami) [RR 0.20, 95% confidence intervals (CI) 0.12-0.34] and the Han (RR 0.26, 95% CI 0.16-0.40). Such differences can be explained by higher PAFs of suicide for three major risk factors (substance dependence, PAF 47.6%, 95% CI 25.5-64.2; emotionally unstable personality disorder, PAF 52.7%, 95% CI 32.8-69.0; family history of suicidal behaviour, PAF 43.5%, 95% CI 23.2-60.2) in this group than in the other two groups. This higher suicide rate was substantially reduced from 68.2/100 000 per year to 9.1/100 000 per year, comparable with the other two groups, after stepwise removal of the effects of these three risk factors. Suicide rates by self-poisoning were also significantly higher in this group than in the other two groups. CONCLUSIONS: Higher rates of specific risk factors and use of highly lethal pesticides for suicide contributed to the higher suicide rate in one ethnic group in Taiwan. These findings have implications for developing ethnicity-relevant suicide prevention strategies.


The records of 218 poisoning deaths from a Department of Forensic Medicine in a University of China, Tongji Center for Medicolegal Expertise in Hubei (TCMEH), from 1999 to 2006 were retrospectively reviewed. The majority (69.7%) of fatalities was between the ages of 20 and 49 years, and there was a male preponderance (male:female=1.7:1). The most common classes of substances involved in fatalities were rodenticide (19.7%), insecticide and herbicide (17.9%), carbon monoxide (16.5%), drugs (13.8%) and alcohols (12.4%). Ingestion was the predominant route of exposure
(65.1%), followed in frequency by inhalation, injection and dermal. In vast majority (64.7%), the manner of death was accidental; suicidal intent was present in 25.2% of cases, homicide in 3.7%, and undetermined 6.4%. When compared to the former reports from the same institution, one for 1956-1984 and another for 1983-1999, an increase was found in the proportion of deaths due to rodenticides, CO, alcohols and drugs, as well as in accidental poisoning deaths. Poisoning deaths due to pesticides remain the major public health problem in China. Further regulatory enforcement should be carried out by government to restrict and manage the use of pesticides and rodenticides which are most toxic to humans.

London, L., R. I. Ehrlich, et al. (1994). "Notification of pesticide poisoning in the western Cape, 1987-1991." South African Medical Journal 84 (5): 269-272. There is a paucity of data on pesticide-related morbidity and mortality in South Africa. A review of notifications to the western Cape office of the Department of National Health and Population Development from 1987 to 1991 was undertaken to describe the epidemiological profile of pesticide poisoning in the region. Two hundred and twenty-five cases of pesticide poisoning were identified, of which the majority were from rural areas. Farmers, farm workers and their families were most frequently involved in poisoning events, which included accidents arising outside of workplace production (44%), self-inflicted injury (35%) and direct occupational contamination (11%). Farm pesticide stores were the most frequent source of pesticide and a seasonal variation in the trend of poisoning events could be discerned; this corresponded to agricultural spraying practices in the region. The mortality rate was significantly higher among those with self-inflicted injury, particularly farm workers. A concurrent review of hospital admissions for 1991 found that 78% of cases had not been notified. In view of the key role of surveillance in reducing pesticide-related morbidity and mortality, a call is made to improve notification of pesticide poisoning so as to facilitate control of an important potential public health problem.

Marahatta, S. B., J. Singh, et al. (2009). "Poisoning cases attending emergency department in Dhulikhel Hospital- Kathmandu University Teaching Hospital." Kathmandu Univ Med J (KUMJ) 7(26): 152-156. OBJECTIVE: The objective of the present study is to evaluate the characteristics of acute poisoning cases admitted to emergency department over a one year period. The demographic, clinical and psycho-social aspects of the patients were analysed. MATERIALS AND METHODS: A hospital based study was carried out in the emergency department, Kathmandu University Teaching Hospital/ Dhulikhel Hospital, Dhulikhel analysing the data of the poisoning cases attended for one year. The study was carried out amongst inpatients attending emergency with acute poisoning. RESULTS: A total of 54 patients were admitted to the emergency department with acute poisoning. The female-to-male ratio was 1.34:1. Most poisoning occurred in the age group of above 40 years. The mean ages of female and male were 29.87 + or - 14.85 years and 35.54 + or - 15.02 years respectively. By occupation 40.36% of the cases were farmers. Only 35.29% of the patients were illiterate. 79.24% of the cases intentionally consume the poison. Organ phosphorus poisoning (OP) was the most common poisoning. Oral route was
the commonest route of poisoning accounting 98.1%. Sixty-six percentage (66.66%) of the cases had the poison stored in their home with 27.7% bought from the market once needed. Among the cases of acute poisoning 5.55% were fatal. CONCLUSION: The following conclusions were reached: (1) females were at greater risk for poisoning than males, (2) self-poisoning cases constituted the majority of all poisonings, and (3) the main agents of self-poisoning were OP poisoning.


BACKGROUND: The existence of Poison Centers for management and prevention of intoxications has been endorsed by the international experience. In Chile, the Toxicological Information Center at the Pontifical Catholic University of Chile has been active since 1992, receiving about 130,000 calls until 2002. AIM: To analyze the statistical data gathered throughout the first ten years of our Research Center. To delineate the epidemiological pattern of intoxications in Chile. MATERIAL AND METHODS: Retrospective study in which records from calls for toxicological information received during the 1992-2002 period reviewed. Analyzed data were total calls per year, place of call, exposure circumstances, age, sex, route of exposure and involved agents. RESULTS: 96,468 calls analyzed. The main exposure circumstance was "unintentional" (78.6%), followed by "intentional" (16.9%). Intoxications in children under 5 years old motivated 50% of calls. According to route of exposure, ingestions involved 75,992 calls (78.8%). Medications were the most common substances, accounting for 49.2% of calls, followed by cleaning products (12.1%), pesticides (11.3%), industrial and chemical products (10.5%) and cosmetics (2.7%). Medications acting on the CNS were the most recurrent, with 19,096 reports.

CONCLUSIONS: The epidemiological pattern for intoxications in Chile is very similar to that reported in developed and other Latin American countries. Children under 5 years old, are a high risk group for intoxications. It is imperative to improve the recording and follow-up of patients that call to the Center, to improve epidemiological data of intoxications in Chile.


We examined the causes and mortality of poisoning in the province of Mazandaran. In all, 1751 poisoning cases referred to four main hospitals over a three-year period (1997-2000) were included. More poisoning cases were females (55.5%) than males (45.5%) but the proportional mortality for males was greater than for females (65% versus 35%). The greatest proportion of poisonings occurred between the ages of 16 and 25 years. Most frequent was intentional poisoning, followed by accidental and occupational poisoning. Medicines were the most common cause, followed by chemicals such as pesticides. Poisoning by opiates, aluminium or zinc phosphide, rodenticides, petroleum and ethanol intoxication was also observed. Pesticide poisoning was most frequently fatal.

BACKGROUND: Deliberate self-poisoning with agricultural pesticides is the commonest means of suicide in rural Asia. It is mostly impulsive and facilitated by easy access to pesticides. The aim of this large observational study was to investigate the immediate source of pesticides used for self-harm to help inform suicide prevention strategies such as reducing domestic access to pesticides. METHODS: The study was conducted in a district hospital serving an agricultural region of Sri Lanka. Patients who had self-poisoned with pesticides and were admitted to the adult medical wards were interviewed by study doctors following initial resuscitation to identify the source of pesticides they have ingested. RESULTS: Of the 669 patients included in the analysis, 425 (63.5%) were male; the median age was 26 (IQR 20-36). In 511 (76%) cases, the pesticides had been stored either inside or immediately outside the house; among this group only eight patients obtained pesticides that were kept in a locked container. Ten percent (n = 67) of the patients used pesticides stored in the field while 14% (n = 91) purchased pesticides from shops within a few hours of the episode. The most common reasons for choosing the particular pesticide for self-harm were its easy accessibility (n = 311, 46%) or its popularity as a suicide agent in their village (n = 290, 43%). CONCLUSION: Three quarters of people who ingested pesticides in acts of self-harm used products that were available within the home or in close proximity; relatively few patients purchased the pesticide for the act. The study highlights the importance of reducing the accessibility of toxic pesticides in the domestic environment.


To determine the various factors involved in poisoning deaths, a 10-y retrospective review of 335 cases were carried out. There was an increasing trend in number of poisoning deaths from 1993-94 to 1999-2000, followed by a decline trend the last 2 y (2001-02). Ninety-one percent of the deaths were due to self-poisoning, with 77.6% of the fatalities due to insecticide consumption. Most cases occurred during winter and in the victim’s rural home. Amongst all the poisoning deaths, 249 were males and 86 were females, most in the of 20-29 y age group. Suggestions have been made for the prevention of insecticide poisoning.


INTRODUCTION: Every year million people have poisoning. Most of them will due to severity of complications. Identifying the pattern of poisoning will help to prevent of them. Because of the non-medicine substance have a wide variety range and easily is used among people, so the aim of this study was to determine frequency of non-medicinal poisoning according to 10th revision of International Classification of Diseases (ICD-10) in hospitalized patient. METHOD: This is a descriptive cross section study. The medical records of inpatient hospitalized in hospitals of Mazandaran University of Medical Sciences during 2010-2011 were reviewed. The ICD-10 codes for retrieval patient records were T51-T65 which was included alcohol, organic solvent, halogen derivatives, corrosive substance, detergent, metals,
inorganic substance, carbon monoxide, gases, fumes and vapors, pesticide, noxious substance has eaten as seafood, noxious substance has eaten as food, unspecified substances. The data were analyzed with SPSS and descriptive and X2 statistics. RESULTS: Of the 1546 in patient with diagnosed poisoning, the 581(37.5%) were non medicine poisoning. Median of age 29+/-17 years, 231(51.6%) female, 300(51.6%) are intentional, and the most material were insecticide276 (47.5%), sting 96(16.3%) and alcohol 76(13%) and organic solvent 40 cases and the 38(95%) of them was children. CONCLUSION: According the result of this study the most cause of poisoning was insecticides. Preventive program for all the groups are suggested and for intentional self-harms and suicide attempted the program of consultation is necessary.


The 535 reports of nonoccupational/nonagricultural poisoning with malathion in the Pesticide Incident Monitoring System (PIMS), a data base maintained by the Environmental Protection Agency, were coded and classified to describe the occurrence and to determine risk factors for poisoning. Between 1966 and 1980, 335 (63%) of reported incidents were associated with at least one symptomatic person, with a total of 670 persons exposed. Home exposures accounted for 92% of reports and arose from improper use and labeling problems in 61% and 3% of reports, respectively. Seventeen reports (3%) were associated with commercial extermination at home. One third of the 18 fatalities from malathion were unintentional and, therefore, preventable. The relative risks of fatal outcome from suicidal intent and labeling problems were, respectively 41 (P < 10[-6]) and 4.8 (P = .09). When data from a previously coded data set on diazinon were added, the odds ratios were 20 and 6.7 (both P < .0003). This suggests that public health measures aimed at safer use of pesticides outside the workplace are needed and that the PIMS data are a valuable source of epidemiological data on pesticide poisoning.


OBJECTIVE: To investigate individual socio-demographic characteristics of suicides, the reasons, methods and means employed to commit suicide. DESIGN: A descriptive prospective study of suicides. A structured questionnaire was employed to enquire the details of the itemised objectives. SETTING: Muhimbili National Hospital–in urban Dar es Salaam. SUBJECTS: Fifty three males and 47 females consecutive suicides aged 15 to 59 years RESULTS: The mean age for suicides was found to be 28.2 years. Males were more than females and were ten years older. Sixty two percent of the subjects were single, 30% married. Seventy two percent had primary school education, 19% secondary education. Main reasons for committing suicide were established in 61 cases of which 57.3% (35/61) were due to severe marital and family conflicts, overwhelming disappointments in love affairs and unwanted pregnancies. Eleven subjects with chronic somatic illnesses killed themselves due to unbearable physical pain and overwhelming economic
deprivations motivated ten subjects to take their lives. Sixty nine subjects poisoned themselves predominantly using anti-malarials and pesticides while 27 hanged themselves. A third of the suicides consumed alcohol frequently and a quarter of the suicides were HIV positive, a rate twice the national prevalence for sexually active adults. CONCLUSION: Comparatively, women became vulnerable to suicide at a younger age. Dysfunctional social networks played a predominant role among suicides. Family and marital conflicts need closer social attention and timely counseling. Patients with chronic medical conditions and frequent alcohol use need effective exploration concerning suicidal ideation to avert self-annihilation. A policy to control prescriptions of toxic drugs including pesticides is overdue.


This research is based on epidemiological records of toxicological occurrences in individual records of investigation into pesticide poisoning at the Maringa Intoxication Control Center at the Regional University Hospital of Maringa. The intoxications in patients poisoned from 2002 to 2011, in towns that comprise the Central Northern Parana Geographic Mesoregion where Maringa is located, were taken into consideration in this study. As a result, it was established that approximately 67.12% of those poisoned were males, the age groups most affected are 20-29 years old and 30-39 years old. Suicide attempts appear as the main motivation for hospitalization (possibly disguising the chronic intoxication), and mainly insecticides and herbicides are involved in the poisonings, with 62.60% and 26%, respectively. Lastly, the urgent need for public health policies in to reduce this statistic immediately is self-evident, as these poisonings are the ones recorded, as those resulting from food poisoning are not being computed.


OBJECTIVES: The study aims to determine the incidence of suicide attempt, describe the methods used, and assess use of health care services including mental health care after suicide attempt in a rural area of Vietnam.

METHODS: All suicide attempters (104) during 2003-2007 were listed, diagnosed and re-evaluated by trained physicians according to the research criteria of the WHO Multicentre Study of Attempted Suicide. All attempters were interviewed by trained medical staff to investigate methods used, socio-demographic characteristics and use of health services. RESULTS: The yearly incidence was 10.2 per 100000 person-years, 10.6 per 100000 in males and 9.8 per 100000 in females. 99% of cases committed suicide attempt by poisoning, 62.6% by pesticides and 36.3% by pharmaceutical drugs. 34.3% reported having been in contact with somatic care and 13.2% had received mental health care. Among those who reported some treatment received, 47.5% had been in contact with official health care services, 8.1% had pharmacy keepers' consultation or were treated by traditional healers and 4% reported self treatment. CONCLUSION: The incidence of suicide attempt was lower in this population compared to other settings. While the
The majority of attempters use pesticides, many had used psychotropic drugs. Contact with mental health services following the attempt was very limited in this setting. Suicide prevention for this high risk group should focus on reducing access to pesticides and psychotropic drugs. Mental health services should be made more accessible in rural areas.


Objective: Poisoning is one of the major causes of hospitalization and is a major public health problem in the country. India is a developing country in south Asia. Rural population of this country is mostly dependent on agriculture. Pesticides are the most commonly used substances and are easily accessible. The knowledge of pattern of poisoning cases encountered in a particular area is useful to prepare health care professionals to handle these emergencies efficiently. Materials and Methods: A retrospective analysis of poisoning cases admitted to the emergency department of District Government Hospital, Bidar from July 2012 to December 2012 was done to study the pattern of poisoning, mode of poisoning, type of poison, age group involved & outcome were analyzed from hospital records. Results: Total 644 patient records were studied. Acute poisoning in the age group of 21-30 years was the most common with higher frequency in males. Most common intention was suicidal. Organophosphorus compounds were most common cause of poisoning followed by snake bite and drug intake. Overal mortality rate due to poisoning was 5.6% and it was highest among organophosphorus compound poisoning. Conclusion: Highest number of cases of poisoning was encountered in young males. Organophosphorus compounds were most commonly used substance with suicidal intention. The reasons being agriculture based economic, poverty and easy availability of highly toxic pesticides. Community education, early care in tertiary care hospitals and establishment of poison information centre (PIC) may help to reduce the mortality.


BACKGROUND: There is a paucity of data on intentional self-harm and suicide in Thailand. It is crucial to re-evaluate the burden and health outcomes. OBJECTIVE: To measure the character and burden of acts of intentional self-harm in the Thai hospitalized population. MATERIAL AND METHOD: Acts of intentional-self harm were categorized using ICD 10 classification. All of inpatient-related data were analyzed using SPSS 17. RESULTS: Overall intentional self-harm in 2010 led to 24,924 hospitalizations and 854 deaths; an incidence of 35.6/100,000 people with the highest level in two age groups: 18-25 and 26-40 year-olds. Self-poisoning (89%) was the most common method and pesticide was the leading used chemical agents. The total cost of treatment was 149,672,190 baht and the mean length of stay was 2.9 +/- 6.7 days. The mortality rate
increased as the population got older with the highest rate being 10.6% for 70-79 year-olds. In 33.8% of cases, psychiatric co-diagnosis were found with anxiety disorders was the leading comorbidity. CONCLUSION: The incidence of intentional self-harm was medium to high, compared to other East Asians countries. Self-poisoning by exposure to pesticides was the most common self-harm method. Age over 60 had the highest mortality rate. Having a psychiatric co-diagnosis was common.


Paudyal, B. P. (2005). "Poisoning: pattern and profile of admitted cases in a hospital in central Nepal." JNMA J Nepal Med Assoc 44(159): 92-96. An analysis of all poisoning cases admitted in medical and pediatric wards of Patan Hospital for one year (1st Jan to 31st Dec 2004) was carried out. A total of 154 cases were admitted which was 0.8% of total hospital admissions. Females outnumbered males and almost two-thirds patients were young adults (15-34 years). Seasonal variation in poisoning was observed with more cases in the summer months. Organophosphorus compounds (42%), drugs (25%), and zinc phosphide (6.5%) were common poisonings in total and in adult populations, whereas kerosene was the most frequent poisoning in pediatric age group. Paracetamol, benzodiazepines, and tricyclic antidepressants were the most frequently used drugs. The circumstances of poisoning were intentional (75%) and accidental (20%); most of the childhood poisonings were accidental in nature. The mean hospital stay for all type of poisoning was 7.5 days; whereas it was 10.2 days for organophosphorus, 2.5 days for paracetamol, and 1.5 days each for zinc phosphide and kerosene ingestion. Intensive care unit (ICU) service was required in 17% of patients; and almost 25% developed complications. Aspiration pneumonia and respiratory failure were the most frequently observed complications. Ninety four percent of admitted patients recovered completely, leaving a mortality rate of 5%.

Pires, D. X., E. D. Caldas, et al. (2005). "[Pesticide use and suicide in the State of Mato Grosso do Sul, Brazil]." Cad Saude Publica 21(2): 598-605. Prevalence of suicide with pesticides in the State of Mato Grosso do Sul, Brazil, was evaluated based on data from the Integrated State Center for Toxicological Surveillance under the State Health Department and reported from January 1992 to December 2002. Population and crop production data were collected from the Brazilian Institute of Geography and Statistics, and suicide data were obtained from the State Health Department. During the period studied, 1,355 cases of pesticide poisoning were reported, including 506 suicide attempts, resulting in 139 deaths. The regions of Campo Grande and Dourados had the highest prevalence of suicide attempts, with Dourados having the most deaths. Dourados also had a high prevalence of suicide attempts overall, with an increasing trend in the previous 10 years. The results indicated that Dourados is a critical region in the State in terms of intentional ingestion of pesticides, showing the need for an epidemiological
investigation to better evaluate and quantify these events among the rural population.


BACKGROUND: Continuous exposure to many chemicals, including through air, water, food, or other media and products results in health impacts which have been well assessed, however little is known about the total disease burden related to chemicals. This is important to know for overall policy actions and priorities. In this article the known burden related to selected chemicals or their mixtures, main data gaps, and the link to public health policy are reviewed. METHODS: A systematic review of the literature for global burden of disease estimates from chemicals was conducted. Global disease due to chemicals was estimated using standard methodology of the Global Burden of Disease. RESULTS: In total, 4.9 million deaths (8.3% of total) and 86 million Disability-Adjusted Life Years (DALYs) (5.7% of total) were attributable to environmental exposure and management of selected chemicals in 2004. The largest contributors include indoor smoke from solid fuel use, outdoor air pollution and second-hand smoke, with 2.0, 1.2 and 0.6 million deaths annually. These are followed by occupational particulates, chemicals involved in acute poisonings, and pesticides involved in self-poisonings, with 375,000, 240,000 and 186,000 annual deaths, respectively. CONCLUSIONS: The known burden due to chemicals is considerable. This information supports decision-making in programmes having a role to play in reducing human exposure to toxic chemicals. These figures present only a number of chemicals for which data are available, therefore, they are more likely an underestimate of the actual burden. Chemicals with known health effects, such as dioxins, cadmium, mercury or chronic exposure to pesticides could not be included in this article due to incomplete data and information. Effective public health interventions are known to manage chemicals and limit their public health impacts and should be implemented at national and international levels.


Objective: To investigate the epidemiological characteristics of suicidal poisoning in Toxicology Clinic, Emergency Hospital "Pirogov" Sofia in relevance to age, gender and socioeconomic factors. Methods: This was a retrospective review of all patients with attempted suicide, admitted for treatment of acute self-poisoning from January 1st, to December 31st, 2007 in the Clinic. The indicators investigated were of demographic, socioeconomic and of substance relevance. Results: A total of 360 patients with attempted suicide were included in the study, over a period of 12 months. The oldest patient presented was 89 years old and the youngest was 12 years old. The age group of the majority of the patients was 26-35 years. 20.6% were males and 79.4% were females. Suicide attempt intoxications were more common in unmarried persons (150 cases - 41.8%)
and in patients with a regular job (147 cases - 40.8%). Medicines were the leading cause of self-poisoning. 350 patients (97.2%) had taken various medicines. In 10 other patients we documented different domestic products, pesticides etc. On a monthly basis, admissions during January, March, and June were most common (37, 34 and 33 patients, respectively). The most frequent cause for committing suicidal attempts by self poisoning found in both genders was: depression as separate disease; various social and economic reasons, isolation from social or family life. 5.28% (19 cases) had at least one previous suicidal attempt. There were 5 (1.39%) deaths reported among the cases. Conclusion: Suicidal behaviors are common in our society. Age group between 26 to 35 years in both genders proved to be associated with suicidal attempts. Female prevailed over the male, but males tend to make more severe attempts with the intention of completing it. Though depression was a major culprit, social or family problems were found to be the most frequent cause of suicide attempts.


BACKGROUND: The rate of non-fatal self-poisoning in Sri Lanka has increased in recent years, with associated morbidity and economic cost to the country. This review examines the published literature for the characteristics and factors associated with non-fatal self-poisoning in Sri Lanka. METHODS: Electronic searches were conducted in Psychinfo, Proquest, Medline and Cochrane databases from inception to October 2011. RESULTS: 26 publications (representing 23 studies) were eligible to be included in the review. A majority of studies reported non-fatal self-poisoning to be more common among males, with a peak age range of 10-30 years. Pesticide ingestion was the most commonly used method of non-fatal self-poisoning. However three studies conducted within the last ten years, in urban areas of the country, reported non-fatal self-poisoning by medicinal overdose to be more common, and also reported non-fatal self-poisoning to be more common among females. Interpersonal conflict was the most commonly reported short-term stressor associated with self-poisoning. Alcohol misuse was reported among males who self-poisoned, and data regarding other psychiatric morbidity was limited. CONCLUSIONS: The findings indicate that pesticide ingestion is the commonest method of non-fatal self-poisoning in Sri Lanka, and it is more common among young males, similar to other Asian countries. However there appears to be an emerging pattern of increasing medicinal overdoses, paralleled by a gender shift towards increased female non-fatal self-poisoning in urban areas. Many non-fatal self-poisoning attempts appear to occur in the context of acute interpersonal stress, with short premeditation, and associated with alcohol misuse in males. Similar to other Asian countries, strategies to reduce non-fatal self-poisoning in Sri Lanka require integrated intervention programs with several key aspects, including culturally appropriate interventions to develop interpersonal skills in young people, community based programs to reduce alcohol misuse, and screening for and specific management of those at high risk of repetition following an attempt of self-poisoning.
We retrospectively reviewed poisoning admissions to all government health facilities from 1999 to 2001, in an effort to expand our current knowledge on poisoning in Malaysia to a level that better reflects a nationwide burden. There were 21,714 admissions reported with 779 deaths. The case-fatality rate was 35.88/1000 admissions. The majority of admissions (89.7%) and deaths (98.9%) occurred in adults. Some 55.1% of all admissions were female, mostly involving pharmaceutical agents. Male poisoning admissions were more often due to chemical substances. The prevalence of poisoning and death was highest among Indians compared to all other races in Malaysia. Overall, the majority of poisoning admissions were due to pharmaceutical agents, with agents classified as non-opioid analgesics, anti-pyretics and anti-rheumatics the most common. Pesticides accounted for the largest number of fatalities. It was also the commonest substance reported in cases of intentional self-harm. Most cases of poisoning admissions occurred due to accidental exposure (47%), followed by cases of intentional self-harm (20.7%). Overall, this study has managed to contribute substantial additional information regarding the epidemiology of poisoning in Malaysia, highlighting important issues, such as the rampant poisonings involving pesticides and analgesics, as well as the high prevalence of poisoning among Indians in Malaysia.

Deliberate self-harm is a challenging public health issue. We aimed to understand the behavior of deliberate self-harm, both fatal and nonfatal, in a tertiary health care setting. A two year retrospective hospital record-based research was conducted in a tertiary care hospital attached to a teaching medical institution in Karnataka to record socio-demographic profile and clinical outcome of suicidal behavior. Data were collected by using specially devised deliberate self-harm proforma. During the two year research period 137 patients were reported with deliberate self harm, among which 17 had fatal outcome and 120 recovered after treatment. Of these 58.4% were females and 41.6% males. The majority (48.2%) cases were from age group of 21-30 years. Victims were predominantly belonged to Hindu community (83.2%). The majority of acts of deliberate self-harm (90%) were committed inside the home. Poisoning was the commonest (57.7%) method of self-harm, particularly using pesticide. Psychiatric illness was seen in 67.9% deliberate self harm victims.

Exposure to pesticides has been the source of many acute and chronic health problems in the rural population, mainly in developing countries. The objective of this study was to characterize the poisonings from acute exposure to agricultural pesticides used in the state of Mato Grosso do Sul, Brazil, from 1992 to 2002, which were reported to the Integrated Center of Toxicological Vigilance of the State Health Department. A total of 1355 involuntary (accidental or occupational) and voluntary (intentional
self-poisoning) cases were reported during the period of the study. The majority of the poisonings occurred with men ranging in age from 15 to 49 years of age (55.1%). One hundred seventy-six poisonings lead to death, with a case fatality rate (CFR) three times higher than the average Brazilian CFR. The pesticide poisoning rates, per 100,000 inhabitants living in rural areas, ranged from 25 to 65.7 during the period of the study. In 2000, the micro-region of Campo Grande, where the state capital is located, had the highest rate, with 100.5 exposure/100,000 inhabitants, followed by Dourados, the larger agricultural region of the state. Insecticides were involved in 75.7% of the poisoning cases, followed by herbicides, with 12.2% of the cases. The anticholinesterase insecticides methamidophos, carbofuran and monochrotophos were the primary pesticides involved in the poisonings. The insecticide dimethoate was associated with the highest CFR (30.8%). The high rates of pesticide poisoning in the rural populations of certain regions of the state of Mato Grosso do Sul indicate the need for a more detailed study concerning the risk of pesticide poisoning among these populations.


Introduction: Every year million people have poisoning. Most of them will due to severity of complications. Identifying the pattern of poisoning will help to prevent of them. Because of the non-medicine substance have a wide variety range and easily is used among people, so the aim of this study was to determine frequency of non-medicinal poisoning according to 10th revision of International Classification of Diseases (ICD-10) in hospitalized patient.

Method: This is a descriptive cross section study. The medical records of inpatient hospitalized in hospitals of Mazandaran University of Medical Sciences during 2010-2011 were reviewed. The ICD-10 codes for retrieval patient records were T51-T65 which was included alcohol, organic solvent, halogen derivatives, corrosive substance, detergent, metals, inorganic substance, carbon monoxide, gases, fumes and vapors, pesticide, noxious substance has eaten as seafood, noxious substance has eaten as food, unspecified substances. The data were analyzed with SPSS and descriptive and X2 statistics. Results: Of the 1546 in patient with diagnosed poisoning, the 581(37.5%) were non medicine poisoning. Median of age 29+17 years, 231(51.6%) female, 300(51.6%) are intentional, and the most material were insecticide276 (47.5%), sting 96(16.3%) and alcohol 76(13%) and organic solvent 40 cases and the 38(95%) of them was children. Conclusion: According the result of this study the most cause of poisoning was insecticides. Preventive program for all the groups are suggested and for intentional self-harms and suicide attempted the program of consultation is necessary. AVICENA 2013.


BACKGROUND AND OBJECTIVE: The agricultural industry is the largest economic sector in Palestine and is characterized by extensive and unregulated use of pesticides. The objective of this study was to analyze
phone calls received by the Poison Control and Drug Information Center (PCDIC) in Palestine regarding pesticide poisoning. METHODS: All phone calls regarding pesticide poisoning received by the PCDIC from 2006 to 2010 were descriptively analyzed. Statistical Package for Social Sciences (SPSS version 16) was used in statistical analysis and to create figures. RESULTS: A total of 290 calls regarding pesticide poisoning were received during the study period. Most calls (83.8%) were made by physicians. The average age of reported cases was 19.6 +/- 15 years. Pesticide poisoning occurred mostly in males (56.9%). Pesticide poisoning was most common (75, 25.9%) in the age category of 20-29.9 years. The majority (51.7%) of the cases were deliberate self-harm while the remaining was accidental exposure. The majority of phone calls (250, 86.2%) described oral exposure to pesticides. Approximately one third (32.9%) of the cases had symptoms consistent with organophosphate poisoning. Gastric lavage (31.7%) was the major decontamination method used, while charcoal was only utilized in 1.4% of the cases. Follow up was performed in 45.5% of the cases, two patients died after hospital admission while the remaining had positive outcome. CONCLUSION: Pesticide poisoning is a major health problem in Palestine, and the PCDIC has a clear mission to help in recommending therapy and gathering information.

Senarathna, L., S. F. Jayamanna, et al. (2012). "Changing epidemiologic patterns of deliberate self poisoning in a rural district of Sri Lanka." BMC Public Health 12: 593. BACKGROUND: Acute poisoning is a major public health issue in many parts of the world. The epidemiology and the mortality rate is higher in low and middle income countries, including Sri Lanka. The aim of this study was to provide details about the epidemiology of acute poisoning in a rural Sri Lankan district and to identify the changing patterns and epidemiology of poisoning. METHODS: A prospective study was conducted from September 2008 to January 2010 in all hospitals with inpatient facilities in Anuradhapura district of North Central Province of Sri Lanka. Acute poisoning data was extracted from patient charts. Selected data were compared to the data collected from a 2005 study in 28 hospitals. RESULTS: There were 3813 poisoned patients admitted to the hospitals in the Anuradhapura district over 17 months. The annual population incidence was 447 poisoning cases per 100,000 population. The total number of male and female patients was approximately similar, but the age distribution differed by gender. There was a very high incidence of poisoning in females aged 15-19, with an estimated cumulative incidence of 6% over these five years. Although, pesticides are still the most common type of poison, medicinal drug poisonings are now 21% of the total and have increased 1.6 fold since 2005. CONCLUSIONS: Acute poisoning remains a major public health problem in rural Sri Lanka and pesticide poisoning remains the most important poison. However, cases of medicinal drug poisoning have recently dramatically increased. Youth in these rural communities remain very vulnerable to acute poisoning and the problem is so common that school-based primary prevention programs may be worthwhile. Lalith Senarathna, Shaluka F Jayamanna, Patrick J Kelly, Nick A Buckley, Michael J Dibley, Andrew H Dawson. These authors contributed equally to this work.

A total of 472 cases of poisoning were seen over a two year period in Kandy, Ceylon. The overall mortality was 23.7%. The pattern of poisoning was different from that in western countries in that 49.8% of the cases were due to insecticide poisoning and only 10.7% were due to drugs, including barbiturates. Insecticides accounted for 73.2% and drugs for only 4.5% of the 112 fatal cases. Of the fatal cases 51.7% were between the ages of 20 and 40 years and only 6.2% were over 50 years. The wastage of economically useful lives indicates the need for a poison centre.


Objective: Enough attention has not been dedicated to prevention of acute poisoning, and the relatively rarer accidental and criminal poisoning. Since the clinical toxicologist is familiar with all aspects of acute poisoning, from circumstances of poisoning to outcome, s/he should also be competent to consider the possibilities for prevention of acute poisoning. Methods: The purpose of this paper is to analyze acute poisonings, clinically treated and to define valid elements for proposals for prevention. The following were analyzed: the manner and circumstances of poisoning, neuropsychiatric disorders (NPS), other reasons for risk of poisoning and suicide, recurrence of poisoning, family history of suicide or severe neuropsychiatric disease. Results: Last year 1192 poisoned patients were examined at the clinic. The intoxications involved were: alcohol 386 (32%), pesticides 153 (13%), corrosives 184 (16%), heroin 112 (9%), drugs, 293 (25%) and others 64 (5%). Of the total intoxications, 723 (60%) were women and 469 men (40%). A high proportion of intoxications were in young people aged from 20 to 30 years and in patients over 60 years. The majority of cases involved intentional ingestion of poisons, and only 5% of the cases involved accidental poisoning. In 98% of acute poisonings, drugs or toxic substances were located close at hand or in the immediate surroundings of the home environment. Of patients poisoned by drugs, 81% have been poisoned by the drug which was normally used in therapy. In 95% of those poisoned with chemicals they were taken from the immediate vicinity of the home environment. Of 21% of neuropsychiatric patients, 70% were not adequately treated, nor regularly monitored. There were 10% with recurrent intoxications and 45% with a family history of suicide or NPS disease. Conclusion: There is no need to hold large quantities of drugs in the household pharmacy, and toxic chemical substances should be kept well secured. This is especially true for families where there are suicidal, NPS patients, or chronic alcoholics. Precautions should be taken where there are younger people, emotionally unstable, with adolescent crises or who have made verbal statements about suicide, and the elderly with handicapped vision or psycho-organic disabilities.

To characterize the poisoning cases admitted to the Loghman-Hakim Hospital Poison Center (a teaching reference hospital of poisoning) in Tehran, Iran. All admitted acutely poisoned patients from January to December 2003 were evaluated retrospectively. Information of socio-demographic characteristics, agents and cause of poisoning, and the mortality rate were collected from medical records of the hospital. During this period, 24,179 cases were referred to the emergency department that 10,206 of them were admitted. Of the admitted cases, 51% were male and 49% female. The majority (38%) of cases were in the age range of 21-30 years. Most (79%) of poisonings were intentional and 21% were unintentional. The most important agents of acute poisoning were drugs (69.13%) especially sedative-hypnotics followed by opioids (12.34%) and pesticides especially organophosphates (OPs) (6.21%). The mortality rate was 1.3% (318 patients). Death was mostly occurred by opioids (41.54%), followed by drugs (28%) and pesticides especially OPs (12%). The prevention and treatment of poisoning due to opioids, pesticides specially OPs and sedative-hypnotics drugs should merit high priority in the health care of the indigenous population of Tehran.


The objective of this study was to survey aluminum phosphide (AlP) poisoning in a referral poisoning hospital in Tehran servicing an estimation of 10,000,000 populations. Records of all patients admitted and hospitalized during a period of 7 years from January 2000 to January 2007 were collected and analyzed according to gender, age, cause of intoxication, amount of AlP consumed, route of exposure, time between exposure and onset of treatment, signs and symptoms of intoxication at admission, therapeutic intervention, laboratory tests, and outcome. During the studied years, 471 patients were admitted to the hospital with AlP poisoning; 50% of them were men. The overall case fatality ratio was 31%. The mean age was 27.1 years, and most of the patients were between 20 and 40 years old. Self-poisoning was observed in 93% of cases. The average ingested dose was 5.1 g, and most of the patients (73%) consumed 1-3 tablets of AlP. A wide range of symptoms and signs was seen on admission, but the most common one was cardiovascular manifestations (78.12%). The majority (65%) of patients were from Tehran. Poisoning in spring and winter (34% and 24%, respectively) was more common than other seasons. Gastric decontamination with potassium permanganate, and administration of calcium gluconate, magnesium sulfate, sodium bicarbonate, and charcoal were considered for most of the patients. Mean arterial blood pH was 7.23 and bicarbonate concentration was 12.7 mEq/L. One-hundred percent of patients with blood pH <7 died and 100% of patients with blood pH >/= 7.35 survived. Electrocardiogram (EKG) abnormalities were noted in 65.6% of cases. There was a significant difference between survival and non-survival according to pH, HCO3 concentration, and EKG abnormality. Even without an increase in resources, there appears to be significant opportunities for reducing
mortality by better medical management and further restrictions on the AIP tablets usage. Arterial blood pH seems to be a prognostic factor for the outcome of AIP-poisoned patients.

The purpose of this study was to investigate the epidemiologic characteristics of the death by poisoning in Korea. We recoded the Death Certificates Database by injury based on the short version of the International Classification of External Causes of Injuries (ICD). We evaluated the mortality rate by total injury and poisoning, and analyzed the mortality rate by age, gender, year and month, toxic agent, and intent. Adjusted odds ratios were calculated to evaluate the effects of socioeconomic factors on suicidal poisoning death. The total number of death cases by injury was 346,656. The proportion of death cases by injury decreased from 13.53% of all death cases in 1991 to 11.89% in 2001. However, the mortality rate by poisoning increased rapidly from 1998, and then remained stable. The number of suicidal poisoning deaths has gradually increased, and its mortality rate was 6.41 (per 100,000) in 2001. Major toxic agents were pesticides and herbicides (50.90%) in 2001. Adjusted odds ratios of suicidal poisoning versus other poisonings showed significant differences in education attainment, region, and marital status. In conclusion, the mortality rate by poisoning has increased, and the proportion of suicidal poisoning also has increased compared to that of accidental poisoning.


Objectives: Pesticide self-poisoning is a major problem in developing countries, especially in rural areas, and an important reason is that hazardous pesticides are available without restrictions. Organophosphates (OPs) are the most commonly used pesticides for suicidal poisoning causing over 200,000 deaths in the world yearly. The authors present an alarming increase in fatal OP-related self-poisonings from 1996 to 2006 in the southeastern region of Serbia. Methods: Descriptive, retrospective epidemiological study. Results: National statistical data in Serbia show a 2.7% decrease in the total number of suicides from 1996 to 2006. In the same period, the number of fatal self-poisonings increased by 18%, from 108 to 128. Ni is the centre of the southeastern part of Serbia, which is a low-income region with a predominantly rural population. In the University Clinical Centre in Ni, the total number of cases of fatal self-poisonings increased from 11 in 1996 to 32 in 2006 (10% and 25% of the total numbers in Serbia in these two years). Of these cases, 5 were related to OPs in 1996, and 16 in 2006. Thus, the number of OP-related fatal self-poisonings has increased by 320% in the Ni region in the ten-year period, and currently accounts for 50% of all the suicidal poisonings in this region. Conclusion: Measures should be taken to restrict the availability of pesticides.

A four-year retrospective study was carried out in which all patients of acute poisoning admitted to Pravara Rural Hospital, Loni during the period: January 01, 2002 to December 31, 2005 were included. A total 1856 patients were admitted to Intensive Care Unit (ICU) of which 385 (20.7%) patients were due to acute poisoning, of these, 312 (81.0%), were due to agro & horticultural poisons. In 13.8 % of the cases identity of the poison could not be ascertained. Organophosphates were the most commonly misused poison irrespective of age, sex and seasons. Both hospitalizations and deaths occurred more frequently in males and incidence was highest in the age group of 21 to 35 years. The study highlights the problem of poisoning in the region. Since the majority of cases of poisoning are from low socioeconomic status, poisonings from agricultural and horticultural chemicals are an important public health problem. Preventive efforts need to incorporate the fact that many serious cases, such as organophosphate poisonings are suicidal in nature.


BACKGROUND: The aim of this study was to characterize the poisoning cases admitted to the government Wenlock Hospital (a teaching hospital of Kasturba Medical College) Mangalore, India. STUDY DESIGN: All cases admitted to the emergency department of the hospital between January 2001 to May 2003 evaluated retrospectively. Data obtained from the hospital medical records and included the following factors: socio-demographic characteristics, agents and route of intake, and time of admission of the acutely poisoned patients. RESULTS: Of the total 33,207 patients admitted in the hospital for treatment, 325 patients were for to acute poisoning. This was 1% of all emergency admissions. Of these 70% were males and 30% females. The majority (36%) cases were from age group of 21-30 years. Most (72%) poisonings were intentional and only 27% were unintentional. The most important agents of acute poisoning were agrochemical pesticides (49%) followed by drugs (17%), and alcohols (13%). Forty-eight (15%) patients died. The poisons responsible for most of the mortality were organophosphate pesticides (65%) and aluminium phosphate (15%). In summary, the prevention and treatment of poisoning due to organophosphate and aluminium phosphate should merit high priority in the health care of the indigenous population of South India (Dakshina Kannada district).


A prospective study of 559 cases of acute poisoning who came to this hospital over a period of 14 months. 91.4% cases were of self poisoning (suicidal), 8.1% accidental and only 0.5% homicidal. Majority of patients were young (mean age 27 years), males twice the number of females. Almost 3
4th of the total patients belonged to lower socio-economic group (rural more than urban). The common causative factors which led to self poisoning were marital disharmony, economic hardships and scolding/disagreement with other family members. Aluminium phosphide (ALP) was the most commonly abused substance followed by organophosphates and zinc phosphide in 67.8, 13.9 and 4.3% cases respectively. The overall mortality rate in the series was 33.82%, but true mortality rate in patients who consumed ALP was as high as 67.6%. Most of these cases (94.9%) were not given any preliminary treatment in the village primary health centre (PHC) nearest to the site of mishap and they were brought/referred to this hospital straight and thus most valuable time crucial for effective treatment was lost. Easy availability of a highly toxic substance like ALP at peak moments of frustration has added fuel to the fire and pushed up the incidence of self-poisoning. Suggested preventive measures include caging of tablets in plastic packs, stringent restrictions on free supply of ALP and education of medical/paramedical personnel involved in health care delivery at grass root level.


BACKGROUND: Aluminum phosphide (AIP) is also known as “rice tablet” in Iran. Due to the high incidence of acute AIP poisoning and its associated mortality in Iran, the authorities banned AIP-containing tablets in 2007. The aim of this study is to evaluate the trend of acute fatal AIP poisoning subsequent to this restriction. MATERIALS AND METHODS: 0 This is a retrospective chart review of patients with acute "rice tablet" poisoning who were admitted to Loghman Hakim Hospital Poison Center, Tehran, Iran, from 2007 to 2010. Collected information included gender, age, type of poisoning, marital status, duration of hospitalization, and outcome. RESULTS: There were 956 cases with a mortality rate of 24.06%. The incidence of fatal AIP poisoning was 2.1 and 5.81 per one million populations of Tehran in 2007 and 2010, respectively. In 223 of the fatal cases (97%) and 697 of the non-fatal cases (96%), the poisoning was intentional. The male to female ratio in the fatal and non-fatal cases was 1.04:1 and 1:1.3, respectively. Most of the fatal cases (n = 122, 53%) were unmarried. The mean age was 27.32 +/- 11.31 and 24.5 +/- 8.19 years in fatal and non-fatal cases, respectively. In 196 (85.2%) of the fatal cases and in 577 (79%) of non-fatal cases, the duration of hospitalization was less than 24 hours and between 48-72 hours, respectively. CONCLUSION: The results of this study showed the incidence of "rice tablet" poisoning, and its mortality increased since 2007 in spite of the ban. It seems that legislative means alone without other interventions, such as suicide prevention and public education, will not always be able to control or prevent acute intentional poisonings.


OBJECTIVE: Warangal district in Andhra Pradesh, southern India, records >1000 pesticide poisoning cases each year and hundreds of deaths. We aimed to describe their frequency and distribution, and to assess quality of
management and subsequent outcomes from pesticide poisoning in one large hospital in the district. METHODS: We reviewed data on all patients admitted with pesticide poisoning to a district government hospital for the years 1997 to 2002. For 2002, details of the particular pesticide ingested and management were abstracted from the medical files. FINDINGS: During these 6 years, 8040 patients were admitted to the hospital with pesticide poisoning. The overall case fatality ratio was 22.6%. More detailed data from 2002 revealed that two-thirds of the patients were <30 years old; 57% were male and 96% had intentionally poisoned themselves. Two compounds, monocrotophos and endosulfan, accounted for the majority of deaths with known pesticides in 2002. Low fixed-dose regimens were used in the majority of cases for the most commonly used antidotes (atropine and pralidoxime). Inappropriate antidotes were also used in some patients. CONCLUSIONS: It is likely that these findings reflect the situation in many rural hospitals of the Asia Pacific region. Even without an increase in resources, there appear to be significant opportunities for reducing mortality by better medical management and further restrictions on the most toxic pesticides.


A retrospective analysis of poisoning calls received by the National Poisons Information Centre showed a total of 2719 calls over a period of three years (April 1999-March 2002). The queries were made on poisoning management (92%) and information (8%) about various products and functioning of the centre. The data were analysed with respect to age, sex, mode and type of poisoning. The agents belonged to various groups: household products, agricultural pesticides, industrial chemicals, drugs, plants, animal bites and stings, miscellaneous and unknown groups respectively. The age ranged from less than 1 to 70 years, with the highest incidence in the range of 14-40 years, with males (57%) outnumbering females (43%). The most common mode of poisoning was suicidal (53%), followed by accidental (47%). The route of exposure was mainly oral (88%). Dermal (5%), inhalation and ocular exposure contributed 7% to the total. The highest incidence of poisoning was due to household agents (44.1%) followed by drugs (18.8%), agricultural pesticides (12.8%), industrial chemicals (8.9%), animals bites and stings (4.7%), plants (1.7%), unknown (2.9%) and miscellaneous groups (5.6%). Household products mainly comprised of pyrethroids, rodenticides, carbamates, phenyl, detergents, corrosives etc. Drugs implicated included benzodiazepines, anticonvulsants, analgesics, antidepressants, tricyclic antidepressants, thyroid hormones and oral contraceptives. Among the agricultural pesticides, aluminium phosphide was the most commonly consumed followed by organochlorines, organophosphates, ethylene dibromide, herbicides and fungicides. Copper sulphate and nitrobenzene were common among industrial chemicals. The bites and stings group comprised of snake bites, scorpion, wasp and bee stings. Poisoning due to plants was low, but datura was the most commonly ingested. An alarming feature of the study was the high incidence of poisoning in children (36.5%). The age ranged from less than 1 to 18 years and the most vulnerable age group included children from less than 1 year to 6 years. Accidental mode
was the most common (79.7%). Intentional attempts were also noticed (20.2%) in the age group above 12 years. The present data may not give an exact picture of the incidence of poisoning in India, but represents a trend in our country. The Poisons Information Centre plays a vital role in providing timely management guidelines including the supply of necessary antidotes from the recently established National Antidote Bank, thereby helping to save precious lives.

Acts of deliberate self-harm (DSH) not only affect the people directly involved, but also have grave psychological and social impact on the family and community. In the present study, a cohort of 173 cases of DSH reported from April 2002 to March 2005 was retrospectively analyzed, by perusing the medicolegal register maintained by the Emergency Department at the Western Regional Hospital, Pokhara in the Western Development Region of Nepal. The data were entered and analyzed using SPSS Version 10.1. More than two-thirds of total cases were females. About 60% of cases were observed in the age group of 15-24 years. Poisoning (89.6%) was the most preferred method of deliberate self-harm. Organophosphate pesticides were consumed in nearly two-thirds of the poisoning cases. The majority of cases were reported during the months of May to July and had occurred during the last quarter of the day. More than a twofold increase was observed in the frequency of cases during the 3-year study period. The said observations were compared and contrasted with the available literature across the globe. The presentation is concluded by highlighting the limitations encountered in Nepal and the scope to overcome the same.

BACKGROUNDS: Whether suicide in China has significant seasonal variations is unclear. The aim of this study is to examine the seasonality of suicide in Shandong China and to assess the associations of suicide seasonality with gender, residence, age and methods of suicide. METHODS: Three types of tests (Chi-square, Edwards' T and Roger's Log method) were used to detect the seasonality of the suicide data extracted from the official mortality data of Shandong Disease Surveillance Point (DSP) system. Peak low ratios (PLRs) and 95% confidence intervals (CIs) were calculated to indicate the magnitude of seasonality. RESULTS: A statistically significant seasonality with a single peak in suicide rates in spring and early summer, and a dip in winter was observed, which remained relatively consistent over years. Regardless of gender, suicide seasonality was more pronounced in rural areas, younger age groups and for non-violent methods, in particular, self-poisoning by pesticide. CONCLUSIONS: There are statistically significant seasonal variations of completed suicide for both men and women in Shandong, China. Differences exist between residence (urban/rural), age groups and suicide methods. Results appear to support a sociological explanation of suicide seasonality.

BACKGROUND: Acute pesticide poisoning (APP) is a well-recognized cause of morbidity and mortality but is not well described in developing countries. We describe the toxiccoepidemiology of APP in Zimbabwe. METHODS: All cases of APP admitted to eight major referral hospitals in Zimbabwe from January 1998 to December 1999 (inclusive) were identified using ICD-9 codes and ward registers and relevant information recorded on a standard data collection sheet. RESULTS: There were a total of 914 single pesticide exposures. Almost half (49.1%) resulted from oral exposure to rodenticides, 42.2% from anticholinesterase-type pesticides (ACHTP), mostly organophosphates (OP) that were responsible for over 90% of admissions from ACHTP. Accidental and deliberate self-poisoning (27.1% and 58.6%, respectively) accounted for most cases with only eight homicides. The case fatality rate (CFR) in deaths/100 admissions was 6.8 [62 deaths; 95% Confidence Interval (CI) 5.2-8.6] and was significantly higher in males (9.4) than females (4.1) (CI for difference in proportions: 2.0-8.5). In addition, the CFR for deliberate self-poisoning (DSP), 6.5 deaths/100 admissions, was also significantly higher than that for accidental poisoning (0.8 deaths/100 admissions) (CI for difference in proportions 3.2-7.9). Organophosphates were implicated in 70.9% of all fatalities, with over 20% resulting from oral exposure to rat poison (RP). CONCLUSION: Organophosphates and rat poison (RP) are the leading causes of APP admissions to major referral hospitals in Zimbabwe, with most of the admissions being the result of deliberate self-poisoning. Greater control in the sale and use of these products could help prevent significant morbidity and mortality.


A retrospective study of the pattern of poisoning cases admitted to eight major urban referral hospitals in Zimbabwe over a 2-year period (1996-1999 inclusive) was conducted to describe the pattern of poisoning at these centres. There were a total of 2764 hospital admissions due to poisoning, involving a total of 2846 toxic agents. Accidental poisoning (AP) and deliberate self-poisoning (DSP) accounted for 48.9% (1352 cases) and 41.3% (1142 cases), respectively. With AP, the highest number of cases (45.9%) occurred in children below the age of 5 years, with half of these due to chemicals, mainly paraffin. In the DSP group, however, more than 60% of all cases occurred in the 16-25-year age group. In addition, twice as many females as males were admitted for DSP compared with an overall male-female ratio of 1:1.2. Pesticides (31.4%) and pharmaceuticals (30.4%) were the most common groups of toxic agents responsible for the hospital admissions. Unknown toxins, natural toxins and pesticides showed the highest mortality rates (15.4%, 8.3% and 6.7%, respectively). Compared with the last major survey of poisoning in Zimbabwe, the pattern of poisoning at referral hospitals has changed over the last decade, with an increase in pesticide and pharmaceutical cases and a marked fall in cases of traditional medicine poisoning. Educational and legislative interventions may be required to address these changes. There is the need also to investigate
further the high mortality rates associated with traditional medicine poisoning.
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Thunga, G., K. G. Sam, et al. (2009). "Profile of acute mixed organophosphorus
Organophosphorus (OP) pesticide self-poisoning is a major clinical and
public health problem across much of rural Asia and responsible for two
thirds of suicidal deaths. However, clinical reports or evidence for the
management of mixed poisoning are lacking. Patients are often treated
based on the type of symptoms they exhibit, and there are no specific
guidelines available to treat mixed poisoning. In this case series, we report 3
acute OP poisoning cases with mixed poisons such as organochlorine,
fungicide, copper sulfate, and kerosene. All 3 patients were treated
successfully, with a greater focus on OP poisoning with pralidoxime and
atropine infusion along with standard decontamination procedures. Because
patients developed complications due to the concomitant poisons ingested,
they were later treated symptomatically, and in one case, D-penicillamine
was administered as antidote for copper poisoning. Mixed poisoning
especially with OP compounds makes the diagnosis difficult because the
clinical symptoms of OP predominate, whereas damage produced by other
pesticides is late to develop and often neglected. Common treatment
procedures are focused mainly on the OP poisoning ignoring the
complications of other concomitant pesticides ingested. Treating physicians
should be prepared and consider the possibility of mixed poisoning prevalent
in that region before initiating therapy.

cases admitted to a university hospital in Istanbul." Hum Exp Toxicol 23(7): 347-351.
BACKGROUND: The aim of this retrospective study was to analyse the
characteristics of acute adult poisoning cases admitted to a university
hospital in Istanbul, Turkey. PATIENTS AND METHODS: All cases admitted
to the Emergency Unit of the Istanbul University Cerrahpasa Medical Faculty
Hospital, between January 2001 and December 2001, were included in this
study. We analysed the clinical charts for aetiological and demographical
characteristics of the acutely poisoned patients. RESULTS: There were 284
poisoning cases (207 females and 77 males) among 11834 patients admitted
to the Emergency Unit. This was 2.4% of all emergency admissions. The
female-to-male ratio was 3:1. The mean age was 27+/-12 years (age range
15-87) and the majority of the patients (73.94%) were below the age of 30
years. The median age was 24 years. Medicinal drugs were the major cause
(69.37%) of the cases, followed by inhalation of gases (14.44%), alcohol
(5.99%), alcohol together with illicit drugs (4.23%), food (3.17%), corrosives
(1.76%) and pesticides (1.06%). The route of administration was as follows:
84.51% orally, 14.44% by inhalation and 1.06% by intravenous injection.
Seventy-one per cent of acute poisonings were self-inflicted and 88%
occurred at home. The most frequently involved medicinal drugs were
antidepressants and analgesics. In 32.04% of cases, there was more than
one medicinal drug responsible for the poisoning. The seasonal distribution
in poisoning patients suggested a peak in summer (31.7% of presentations)
and winter (30.9%) and lower numbers in spring (22.9%) and autumn
The follow-up period of the patients were 1-12 hours for 42 cases (14.5%), 13-24 hours for 134 cases (47%) and more than 24 hours for 108 cases (38%). Two of the 284 cases with acute poisonings were fatal. This was a university hospital-based study, so these results may not be representative of the general population. Despite this drawback, these data still provide important information about the characteristics of poisoning in the largest city of the country.

van der Hoek, W. and F. Konradsen (2005). “Risk factors for acute pesticide poisoning in Sri Lanka.” Trop Med Int Health 10(6): 589-596. This report describes the characteristics of patients with acute pesticide poisoning in a rural area of Sri Lanka and, for intentional self-poisoning cases, explores the relative importance of the different determinants. Data were collected for 239 acute pesticide-poisoning cases, which were admitted to two rural hospitals in Sri Lanka. Sociodemographic characteristics, negative life events and agricultural practices of the intentional self-poisoning cases were compared with a control group. Most cases occurred among young adults and the large majority (84%) was because of intentional self-poisoning. Case fatality was 18% with extremely high case fatality for poisoning with the insecticide endosulfan and the herbicide paraquat. Cases were generally younger than controls, of lower educational status and were more often unemployed. No agricultural risk factors were found but a family history of pesticide poisoning and having ended an emotional relationship in the past year was clearly associated with intentional self-poisoning. The presence of mental disorders could only be assessed for a subsample of the cases and controls and this showed that alcohol dependence was a risk factor. This study shows that acute pesticide poisoning in Sri Lanka is determined by a combination of sociodemographic and psychological factors. Suggestions are given for interventions that could control the morbidity and mortality due to acute pesticide poisoning in developing countries.

van der Hoek, W. and F. Konradsen (2006). “Analysis of 8000 hospital admissions for acute poisoning in a rural area of Sri Lanka.” Clin Toxicol (Phila) 44(3): 225-231. BACKGROUND: Acute poisoning, especially deliberate self-poisoning with agricultural pesticides, is an emerging global public health problem, but reliable incidence estimates are lacking. Only a few previous studies have assessed the impact of regulatory or other preventive measures. OBJECTIVE: To estimate trends in incidence and causes of acute poisoning over time in rural Sri Lanka, and to assess the possible impact of policies that aimed to restrict availability of highly toxic pesticides. METHODS: Time series of incidence of acute poisoning based on retrospective in-patient records of six government hospitals in southern Sri Lanka from 1990 to 2002. RESULTS: Data of 8,110 admissions for acute poisoning were available for analysis. Most cases were young adults, who deliberately self-poisoned themselves with pesticides, males outnumbering females. Average incidence rate of acute poisoning over the study period was 318 per 100,000 (95% confidence interval [CI], 311 to 325). Incidence of all poisoning showed an increase over the period of study. However, this increase was lower for pesticide poisoning, and the mortality rate and case fatality ratio of pesticides went down towards the end of the 1990s. The decline in mortality was
attributed to regulatory controls for the group of highly hazardous organophosphorus compounds implemented in 1995 and for the organochlorine endosulfan in 1998. CONCLUSIONS: Regulatory control of highly toxic pesticides provides important health benefits, especially in terms of lower number of deaths from self-poisoning. However, despite the positive effect of these bans, many deaths from pesticide self-poisoning still occur after ingestion of agricultural pesticides classified as only moderately poisonous.


Acute pesticide poisoning is a major public health problem in Sri Lanka. In several agricultural districts, it precedes all other causes of death in government hospitals. Most of the acute poisoning cases are intentional (suicide) and occur among young adults, mainly males. Poisoning due to occupational exposure is also common, but less well documented. In an irrigation area in Sri Lanka a very high incidence of serious pesticide poisoning was observed, with 68% due to intentional ingestion of liquid pesticides. It is argued that the easy availability and widespread use of highly hazardous pesticides is the most important reason for this high number of poisoning cases. The frequent application of highly hazardous pesticides in high concentrations was often irrational and posed serious health and financial risks to the farmers. Sales promotion activities and credit facilities promoted this excessive pesticide use, which was not counteracted by an agricultural extension service. Hazardous practices when spraying pesticides were due to the impossibility of applying recommended protective measures under the local conditions, rather than to lack of knowledge. Current emphasis on programs that promote the safe use of pesticides through education and training of farmers will be ineffective in Sri Lanka because knowledge is already high and most poisoning cases are intentional. Instead, enforcement of legislation to restrict availability of the most hazardous pesticides would result in an immediate health benefit. Improved agricultural extension services to promote alternative non-chemical methods of pest control is the most important strategy, in the long term, to prevent acute pesticide poisoning.


BACKGROUND: Intentional self-poisoning with pesticides is a serious problem in many developing countries. It is a commonly used method among South Asians all over the world. AIMS: To describe the circumstances and characteristics of suicides in Nickerie, e., in order to gain insight into why South Asians commonly use self-poisoning. METHODS: An exploratory psychological autopsy study was conducted among 19 survivors of 13 suicides in the Nickerie district in Suriname. RESULTS: Impulsivity plays an important role in self-poisonings, as well as aggression and easy accessibility of pesticides. CONCLUSIONS: Possible answers to the question why South Asians often use self-poisoning as a method for suicide may be found in culture, upbringing, styles of communication and genetics. However, more research is needed to further explore these hypotheses.

**INTRODUCTION:** Analysis of the annual pesticide poisoning statistics of the Tygerberg Poison Information Centre (TPIC) for the period 2005-2007 showed an increase in the number of amitraz poisonings. This prompted a 2-year survey (2008-2009) to establish the extent of amitraz poisoning in South Africa. Amitraz is a pesticide used as a tick dip. It acts as an alpha(2)-adrenoceptor agonist and the principal clinical effects of amitraz poisoning are related to its stimulation of these receptors; **METHODS:** Data from amitraz poisoning cases in humans were evaluated for 2 years and analyzed for: demographic data, type of exposure, type of formulation, and clinical details. Serious cases were followed up; **RESULTS:** 4.6% of the pesticide poisoning cases were amitraz-related which comprised 0.8% of all TPIC poisoning consultations. Ingestion of amitraz formulations accounted for the majority of the cases (94%). Forty-one percent of cases were children (n = 28) and all were accidental exposures. Of the adult cases (59%), 88% were intentional ingestions. The majority of the cases were from the predominantly rural province of KwaZulu Natal (44.9%). CNS depression was the most common clinical sign (76.8%) followed by bradycardia 34.8%, respiratory depression 27.5%, miosis 27.5%, and hypotension 23.1%. Mechanical ventilation was required in 15.9% of cases. Other commonly reported clinical signs were hypothermia 15.9%, mydriasis 10.1%, and hyperglycaemia 7.2%. Supportive and symptomatic care was shown to be adequate treatment. Amitraz poisoning was misdiagnosed as cholinesterase inhibitor poisoning in 17.4% of cases; **CONCLUSION:** This is the first report of amitraz poisoning in humans in Africa. The data suggest a different demographic pattern in South Africa to that currently reported in the literature. The study identified a very high incidence of intentional poisoning in adults. The misuse of amitraz for deliberate self-harm emphasizes the necessity for continued toxicovigilance.


**BACKGROUND:** The incidence and spectrum of acute poisonings in South Africa are unknown. Poisoning data can be derived from sources such as hospital admission records and poison information centre (PIC) records. **OBJECTIVES:** This study was conducted to examine the extent of the problem and to identify trends and toxicovigilance issues using PIC data. **METHODS:** A survey was conducted based on Tygerberg Poison Information Centre (TPIC) consultations over 1 year. TPIC consultation forms were analysed for patient demographics and causes of poisoning. **RESULTS:** The TPIC dealt with 4,771 consultations related to human exposures to poisonous substances. The study showed that accidental exposure was more common than intentional poisoning (65.2% v. 34.8%); that 55.8% of cases were adults, of which 57.6% were females; and that 61.4% of adult cases were intentional exposures, and of these 64.3% were females. There was a predominance of accidental exposures (98.8%) and a male predominance (59.7%) in children. Categories of poisoning exposures
across all age groups were non-drug chemicals (52.7%), medicines (35.2%) and biological toxins (12.6%). Pesticides (34.8%), irritant/corrosive substances (27.7%) and volatile hydrocarbons (8.3%) were the most common classes of non-drug chemical exposures. Cholinesterase inhibitors (8.8%), anticoagulant rodenticides (7.1%) and pyrethroids (5.0%) were the most commonly ingested non-drug chemicals. Aldicarb and amitraz poisoning were identified as toxicovigilance targets. Analgesics (26.1%) were the most common class of medicine-related exposure, and paracetamol (15.8%), benzodiazepines (9.2%) and antihistamines (5.2%) were the most common medicine-related exposures. CONCLUSION: The study provided information on evolving trends and identified toxicovigilance targets and the need for continuing toxicology education programmes.


This study aimed to assess cases of self-inflicted poisoning among adolescents reported by the Toxicological Care Center of a reference hospital in Recife-PE, Brazil. The data were collected between March and May 2010 from hospital charts and structured interviews with the participants and parents/guardians. Among the 25 cases of attempted suicide registered in the period, 21 were female adolescents, who made up the sample of the present study. The adolescents were between 13 and 19 years of age. Pesticides were the most frequent toxic agent used (61.9%). The results of the present study underscore the importance of studying suicide in this population, with a focus on family relations, in order to lay the foundation for the development of prevention and treatment programs for this vulnerable group.


Objective: The suicide rate continues to increase across the US and varies by methods. The World Health Organization identifies pesticide ingestion as one of the leading methods of suicide. Pesticide exposures are often reported to poison centers (PC) and a significant number of these exposures are related to attempted suicide. This study aims to evaluate the prevalence of suicide by intentional pesticide exposure in a large, demographically diverse state bordering Mexico. Methods: Exposure cases for the most recent 12-year period (2000-2011) were retrospectively analyzed from our PC network database. Cases were evaluated for their exposure characteristics, outcomes and the relationship between suspected attempted suicides and pesticide exposures. A range of 119-139 cases of suicide by pesticides were reported each year. The study excluded patients under age twelve. Results: Over a twelve-year period, a total of 1495 cases were reported in which patients attempted suicide by exposure to pesticides. Insecticides (46%) and rodenticides (46%) accounted for the type of pesticide used in the majority of cases. Cases were distributed by sex in a
3:2 ratio of males to females. Patient age was 20-years-old or greater in 84% of cases. These attempted suicide exposures by pesticide occurred in the patients residence (91%) and the route of exposure was by ingestion in 97% of cases. Analysis of the initial management site reported showed that 77% of the patients were en route or already in a healthcare facility (HCF), while 21% were referred to a HCF. Major or moderate effects were present in 18% of cases, 51% of cases had minor or no effects, 7% of cases were not followed, and 23% were not able to be followed. Death was the medical outcome in only 1% of cases. When examining demographic variations for these exposures, reported attempted suicide by pesticide exposure occurred in urban communities in 85% of cases and 15% in rural communities. Upon further examination, based upon population in rural vs urban areas the rate 100,000 population was 7.29 in rural communities and 6.85 in urban communities. The comparative exposure rate/100,000 population for cases occurring in counties that are located along the US-Mexico border was 8.11 versus 6.79 in non-border counties. Conclusions: Rural areas and border communities are at greater risk for attempted suicide by means of pesticide exposure. This study reveals that with a steady frequency of pesticide poisoning by suicide, there is a need to train and equip healthcare facilities to work with PCs in the evaluation and treatment of these poisoned patients. Because pesticides are easily accessible and stored without any precautions in most households, the frequency of these exposures is likely to continue.


This study determines the risk factors associated with suicide rates and the investigation of time trends in the deprived region of Epirus, north-west Greece, which is considered to be one of the least developed prefectures of the EU. Data selected demonstrated: (1) a mean age-standardized suicide rate per year of 4.00/100,000 for males, 1.29/100,000 for females and 2.65/100,000 for the total population; (2) a significant rising trend of male suicides in the 35-44 and 65-74 age groups; (3) a low female suicide rate in < 35 years age group and a relatively stable rate in the other age groups; (4) a significantly higher suicide rate in men than in women from both urban and rural areas and in older men from rural areas; (5) higher rates of suicide among widowed men and unmarried women; (6) the use of predominantly violent suicide methods, especially self-shooting, hanging and drowning; (7) a significant peak in the total suicide rate in the spring and summer months and a decreased rate in September; and (8) three out of four of the suicide victims had consumed alcohol and/or other drugs before the act. Data reported here shows some remarkable trends compared to previous reports on suicide in Greece and other countries, probably due to cultural and lifestyle characteristics of the study population.


OBJECTIVE: To identify poisoning and toxic exposure pattern, severity, and clinical outcome in Thailand during 2001 to 2004. METHOD: This is a
prospective study. All inquiries were registered, followed up, and verified. Interlocutors, poisons, patients' profiles, severity, and medical outcome after exposure or poisoning were analyzed. RESULTS: A total 14,428 events was suspected as human poisoning or exposure. After follow-up and verification, 98.9% were confirmed as poisoning or poison exposure. These involved 15,016 patients and accounted for 6.0 per 100,000 populations per year. The vast majority of calls (92.4%) were from physicians. Pesticides, household products, and pharmaceutical products were the most common poisons involved in human exposure, which were 41.5%, 19.5%, and 18.9%, respectively. Patients aged 0-6 years, teenagers and adults with 20-29 years of age had the highest rates of exposure, which were 33.0, 24.5, and 10.5 exposures per 100,000 per year, respectively. Unintentional accidental exposure is the major reason of exposure in children, but intentional suicide was the main reason of exposure in teenagers and adults. The death rate of all exposure was 5.5%. Pesticides cause more severe clinical course and the highest death rate (10.0%). CONCLUSION: Features of poisoning in Thailand were different from those in Western countries. Pesticide poisoning was the major problem in Thailand. Intentional suicide was the major circumstance of poison exposure in adults, but accidental exposure was the major reason of exposure in children.

Yang, C. C., J. F. Wu, et al. (1996). "Taiwan National Poison Center: Epidemiologic data 1985-1993." Journal of Toxicology - Clinical Toxicology 34 (6): 651-663. The Taiwan National Poison Center has received more than 30,000 telephone calls since its establishment in July 1985. Objective: To obtain more information about poisoning exposures in Taiwan, a retrospective analysis was conducted of all telephone calls to the center concerning human poisoning exposures July 1985 through December 1993. Methods: The following data were tabulated: age, sex, intent of exposure, route of exposure, substances ingested and clinical severity. Results: During the eight years (1985-1993), 23,436 telephone calls concerning human poisoning exposure were recorded. Adults accounted for most cases (75.2%) and exposures involving males (54.2%) were somewhat more prevalent than female poisoning exposures (44.7%). Intentional poisonings (54.6%) were more common than unintentional poisonings (40.1%, with an inverse relationship in pediatric poisoning exposures. After amphetamines, the most frequently ingested poisons were pesticides, benzodiazipines, and cleaning products. Fatalities occurred most frequently following ingestion of pesticides. The mortality rate was 5.7% for all exposures. Conclusions: Human poisoning is a serious problem in Taiwan. The reduction of suicide attempts is a major objective. Childhood poisonings are underreported and of high mortality.

Zakharov, S., T. Navratil, et al. (2013). "Non-Fatal Suicidal Self-Poisonings in Children and Adolescents over a 5-Year Period (2007-2011)." Basic and Clinical Pharmacology and Toxicology 112 (6): 425-430. The objective of this study was to analyse non-fatal suicidal self-poisonings in children and adolescents and to identify commonalities that might direct preventive health efforts. From the database of the Czech Toxicological Information Center, the inquiries due to non-fatal suicidal self-poisonings in
children (9-13 years old) and adolescents (14-18 years old) in 2007-2011 were evaluated. From 10,492 calls about suicide attempts, 2393 concerned children and adolescents (13.5% and 86.5%, respectively). Most suicide attempts were committed during the spring (31.3%). Among toxic agents, drugs were used in 97.8% of the cases. 63% of cases involved monopoenings and combinations of more than three drugs (10.3%) were rare. The most frequent ingestions appeared using drugs affecting the nervous system and anti-inflammatory non-steroids. The dose was evaluated as toxic in 73.4% of the cases and as severely toxic in 3.0% of the cases. The symptoms of moderate and severe intoxications were present in 10.5% of the cases. First aid was provided in 5.6%, and gastric lavage was performed in 21.9% of the cases. Antidotes were indicated in 13.3% and secondary elimination methods in 4.4% of the cases. Mostly, one or two easily accessible drugs were used in suicide attempts, with paracetamol and ibuprofen were the most common ones. Only one in 10 children applied a non-toxic dose. One-fifth of the patients received medical care within 60 min. and one-third later than 4 hr after exposure. The time criterion for gastric lavages was fulfilled in less than half of the cases, and in every fourth case, the procedure was performed when it was unlikely to be beneficial. 2013 Nordic Pharmacological Society. Published by John Wiley & Sons Ltd.


The aim of this study was to analyze data from toxic substance-related cases in Northeast China (Heilongjiang Province) reported between 2000 and 2010, and to investigate the associations among the classes of toxic substances detected with gender, age, season, district of occurrence, and type of case. Pesticides, drugs, and alcohol were detected using gas chromatography-mass spectrometry or flame ionization detection. Carbon monoxide levels were measured using ultraviolet spectrometry, and levels of cyanides, nitrates, and acid were monitored using the chemical colorimetry method. Among a total of 565 cases, 208 (36.8%) were related to accidental injury/death, 175 (31.0%) to suicide, 80 (14.2%) to homicide, 43 (7.6%) to robbery, 29 (5.1%) to fire or arson, 20 (3.5%) to intentional injury/death, 7 (1.2%) to rape, and 3 (0.5%) to kidnapping. Men constituted 65.3% of the total 565 victims, most of who were between the ages of 31 and 50 years, with the average age being 44 years. The highest number of cases (126) was reported from Harbin, the capital of Heilongjiang Province. Pesticide-related cases accounted for 37.9% of the cases, with more cases occurring between April and August. Methomyl (48 cases) and fluoroacetamide (38 cases) were the most common pesticides involved in these cases. Drug-related cases accounted for 19.5% of the total poisoning cases, with benzodiazepines being the most commonly detected drugs (45 cases). More than 70% of alcohol-related cases involved the use of alcohol in crime (or affair) execution, with the blood alcohol concentration being less than 350 mg/100mL in these cases. Carbon monoxide was detected in 16.1% of the cases, with a higher yearly incidence noted in winter. To our knowledge, this is the first study to provide an overall analysis of toxic substance-related cases in Northeast China. Similar to the findings observed
in Central China (Hubei), our findings indicated that pesticides were the major cause of poisoning in the Heilongjiang Province of Northeast China.


This study was designed to determine if there is a relationship between the degree of suicide intent and the lethality of means employed by those who try to kill themselves. The study sample consists of 74 suicide attempters admitted to emergency rooms in a northeastern area of China. Structured interviews were performed with the patients and their companions to the hospital if necessary. It was found that the reason for the suicide attempt claimed by the highest percentage of attempters (35 of 74) was love marriage issues, and there were significant gender differences in suicide reasons. It also was found that the choice of suicide means is generally independent of gender, and the lethality of means is positively correlated with the degree of suicide intent. One of the implications of the findings is a better understanding of the higher suicide rates for Chinese women than Chinese men. A hypothesis for future study on Chinese suicide may be that the high fatality rate of Chinese women who have swallowed poisonous pesticide is a function of the strong intent of death of the victim coupled with the well-known lethality of the pesticides.