Original Article

Deaths Due to Electrocuton- A Retrospective Study

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Abstract

Retrospective analysis of deaths because of electric shock from the medico-legal death records our college i.e. J.N.M.C., A.M.U., Aligarh, Uttar Pradesh, India. Most of the deaths were of men having the age in between 11-50 years. All deaths were inadvertent and most of them were during the time of monsoon as compared to the deaths in western countries where, baths, warmers or hair dryers were the source of electric shocks. The death rate reported because of electric shock was 0.34 per lakhs (100000) of the population in the present study as against the figures of 0.94 and 0.14 from Bulgaria and Canada respectively. A large portion of the deaths were either prompt or quick. It implies that individuals living at home did not have basic knowledge of dangers of electric shock. In this way mindfulness about utilization of good quality electric machines is the need of great importance.

Key words: Electrocuton, Accidental Deaths, Burns

Introduction

Invention of electricity is about 300 years old and also the mortality related to it. With time, the inventions driven by electricity made the human life dependent on it. Ever increasing dependency on industry and domestic requirement of electricity is also exposing man to the injury by electric current itself and appliances running on it. The other source of such injury is lightning, which is life threatening due to the very high voltage content. An injury due to high voltage is morbid in nature due to instantaneous high energy production.

National crime records bureau data showed 10218 deaths from electrocuton and that constitute 2.6% of all the accidental deaths, of which 0.7% were by lightning, which forms about 2833 cases. Self electrocuton in India accounts for 0.7% of the total suicides, that is 952 out of 134799 suicide deaths in the year 2013.

Materials and Method

The present investigation involves an examination of the Medico-Legal cases recorded during June 2015 to May 2018 (three years). A total of 62 cases of death due to electrocuton were recorded in the Emergency Section of J.N.M.C., A.M.U., Aligarh, Uttar Pradesh, India. We gathered the general data about these cases from the history, the police papers and death certificate. This data was then entered in a proforma made for this reason and there after examined.

Results

Males formed the most number of cases, 43 (69.35 %) and the remaining were females 19 (30.64 %), (Table 1)

On an average, we got 21 cases for each year. A large number of these cases, 30 (48.39 %), were found in the summer and rainy season i.e. during the months June, July and August. (Table 2)
Profile of Medico-legal Cases Admitted in the Department of Emergency F.H.M.C., Tundla, Uttar Pradesh

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ABSTRACT

Looking into the demographic profile of the medicolegal cases in an area lies in the fact that the strategies may be devised and steps could be taken by health care and law enforcement agencies to control or prevent such cases. Considering the importance of profiling of medico legal cases, this retrospective study was undertaken to analyse the pattern and magnitude of the cases admitted in the casualty section of FHMC, Tundla which is situated on National Highway-2 over a period of three years starting from September 2014 to August 2017. The study showed that the road traffic accidents (61.13%) constituted the most number of medicolegal cases out of a total 247, followed by poisoning (23.08%) and burn (7.29%). Males (81.44%) were most affected and most of the victims were in the age group of 16-30 years (52.23%). Most of the cases reported in the casualty between 08:00 am and 04:00 pm and the summer months (39.27%) witnessed maximum number of cases.

INTRODUCTION

Medical personnel's have to deal with a significant number of medical cases in the emergency section with legal implications associated with them like injury, assault (both physical and sexual), poisoning or deaths due to accidents etc. Such cases are an integral part of medical practice and are termed as medicolegal cases (MLC) which more appropriately can be defined as “a case of injury or illness where the attending doctor, after eliciting history and examining the patient, thinks that some investigation by law enforcement agencies is essential to establish and fix responsibility for the case in accordance with the law of the land” [1] [Dogra TD, Rudra A Lyon's].

Profiling of medicolegal cases is an important aspect for the prevention of preventable casualties in future and to study the crime rate in an area [2,3]. The present endeavor aims to study the frequency and pattern of such cases to help the administrators, health care officials, law enforcement agencies and social scientists devise strategies to tackle with and minimize the menace in the society. Agra is a big city and one of the top destinations for tourists in India. F H Medical College is situated about 15 Km from Agra city and is on National Highway 2 (NH-2) which is connected Agra to Kampur city which is another big city in India. Large volume of traffic, including a heavily loaded trucks to cars, bikes, cycles and pedestrian is flowing throughout the day and round the year. This heavy traffic is a constant threat to human morbidity and mortality.

MATERIAL AND METHOD

Total number of cases presented in the emergency section of the hospital, which needed medicolegal evaluation were included in the study during the period September 2014 to August 2017. All the medicolegal cases registered were evaluated on predesigned pro forma which included various factors such as age, sex, type and time of arrival.

The patients who got their medicolegal work done at some other centre and referred to this centre for further management were not included in the study.
Pattern of Suicidal and Para-Suicidal Cases at J.N.M.C.H., A.M.U. Aligarh

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ABSTRACT

Intentional non-fatal acts which were aimed to end life are called Parasuicide acts. Because of under reporting of these cases and concealment of information about such attempted suicides, literature is scarce. Since, parasuicide survivor may be left with residual temporary or permanent disability, it should be dealt seriously. The only way to deal with parasuicide is by controlling risk factors for parasuicide, which will also be helpful in preventing completed suicides. This review presents the risk factors, socio-demographic profile and methods opted for parasuicide with an emphasis on the legal liabilities of parasuicide.

Key words: Disability, legal liabilities, parasuicide

INTRODUCTION

Suicide: An act with a fatal outcome, that is deliberately initiated and performed by the deceased himself in the knowledge or expectation of its fatal outcome, the outcome being considered by the actor as instrumental in bringing about the desired changes in consciousness and/or social conditions. Suicide (Latin suicidium, from suci caedere, 'to kill oneself') is a leading cause of death among teenagers and adults under 35 years of age.¹ It is one of the top 13 causes of death for all ages worldwide, as revealed by the World Health Organization (WHO).² It is believed that socioeconomic and behavioural factors are the fastest emerging cause of suicide in third world countries.³

Most commonly employed method of suicide in India was hanging 41% followed by poisoning in 2014. The highest incidents of 16,307 suicides were reported in Maharashtra followed by 16,122 suicides in Tamil Nadu.³

Parasuicide: An unusual act with non-fatal outcome, that has been performed intentionally with the expectation of such an outcome, that causes self harm, or without intervention from others will do so, or consists of ingesting a substance fatal dosage, the outcome being considered by the actor as instrumental in bringing about the desired changes in expectancies and/or social conditions.⁴ It is defined as a conscious and voluntary act by an individual with intention to injure himself, and with the belief that he is unlikely to survive, but where the injury has not led to death.⁵ The incidence of parasuicide is greatly dependent on age, sex, race, religion, culture, marital status, habitat, climate and social systems.⁶ Erwin Stengel suggests that persons who 'attempt' suicide and those who 'commit' suicide, although represent two different categories, but, there do exists some 'overflow' from one to another.⁷ Ratio for suicide to parasuicide may vary from 1:3 to 1:10.3 and

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Neuroglycopenaia Automatism and Driving Culpability

Abstract
Hypoglycemia unawareness is a stage of automatism in a neuroglycopenaia state of the brain for insulin treated diabetes mellitus patients. Most of the Medico-legal and legal fraternity need awareness in examining patients when they have an accident while driving. There should be a clear guidelines for people suffering from diabetes and are on insulin and oral hypoglycemic. Diabetic patients, because of their propensity to develop hypoglycemia, are more likely to be involved in a driving accident, although only slightly more than the rest of the population. Therefore, it has been a matter of debate since the earliest days of insulin therapy whether patients on insulin therapy should be allowed to have a driving license or not. Heavy vehicle licensing should be properly evaluated on regular intervals for the safety of patients, others people on the road, and the vehicle.

Introduction
The brain constantly requires glucose to function at an optimum level and at with a tightly regulated blood glucose level of 4–10 mmol/L. Any decrease in blood sugar level (<72 mg/dL) can hamper the proper functioning of the brain [1]. Insulin dependent diabetes is one of the factors for the derangement of blood glucose level. Insulin was introduced for the treatment of diabetes long way back in 1922, but it still needs proper monitoring and tight regulation [2]. Hypoglycemia generally defines the blood glucose level, which may be at a lower than certain marked level in the blood 72 mg/dL. It does not reflect the absolute condition of glucose supply to the brain. Symptoms of hypoglycemia can cause profuse sweating, increased system as part of the body’s defense against the effect of hypoglycemia in the brain. These symptoms are collectively called as acute neuroglycopenaia. Sometimes, these symptoms pass undetected, termed as sub acute neuroglycopenaia (hypoglycemia unawareness) [3-5]. Individuals suffering from hypoglycemia unawareness may perform certain habitually performed tasks such as talking, walking, cooking, car driving, etc. When the patient recovers from such episodes, there is no memory of whatsoever work during that episode. There seems to be needs of comprehensive studies to evaluate the cases of hypoglycemia unawareness and proper law to deal it. Theoretical method applied in this article was to study various reported cases of hypoglycemia unawareness and various legal aspect applied to these cases.

Neuroglycopenaia Automatism
It has been acknowledged by some courts that patients may act impulsively while they are impaired by neuroglycopenaia brain malfunction and are incapable of forming intent to commit an offense, ranging from the trivial to the most heinous [6]. Hypoglycemia unawareness is not self-destructive, but may cause serious damage to surrounding people and property. During driving when this happens, a person may cause an accident and continue driving until reaching a destination or stopped by traffic police. It has been reported in the past in the UK to justify a plea of not guilty based on hypoglycemia unawareness [7]. Because of their propensity to develop hypoglycemia, diabetic patients are more likely to be involved in an accident during driving only slightly more than the rest of the population [8,9].

Various indicators of neuroglycopenaia behaviour:
- a. Circumstances to the development of hypoglycemia.
- b. The suspect had taken insulin or hypoglycemia-producing drug at the relevant time.
- c. Change in the patient’s demeanour after being giving sugar.
- d. Amnesia for the events
- e. Motiveless and uncharacteristic behaviour.

Law and Neuroglycopenaia Automatism
Neuroglycopenaia automatism seems to be a grey area in which laws of most developing countries have not paid attention. A country such as India having a population of about 1.25 billion with more than 62 million (7.1 percent) diabetic patients, needs separate regulation on such type of automatism [10].

Characteristics that may be observed during trial in court
- i. The driver suffered hypoglycemia unawareness or had some warning symptoms;
- ii. Was the driver previously aware of the condition? Or;
- iii. He should not have been driving at all.

In India, automation and other types of mental conditions are dealt with in the Indian Penal Code (IPC) section 84. The section of the law mentions about unsound mind and the incapability of knowing the nature of the act [11]. Almost negligible reporting of hypoglycemia unawareness cases doesn’t seem depicting the real picture of such conditions but it may merely be reflecting unawareness of the condition. This hypoglycemia unawareness needs a proper attention address on all fronts, including medical, legal, political and social.
Case Report

High Voltage Electric Burn Injury to Penis - A Case Report

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Abstract

History of electricity is not more than 300 years old as also the mortality related to it. With time, the inventions dependent on electricity made humans depend on it. Ever increasing dependency on industry and domestic needs on electricity is also exposing man to the injury by electric current and equipments running on it. The other source of such injury is lightning, which is very much life threatening due to the very high voltage content. An injury due to high voltage is often very morbid in nature due to instantaneous high energy production upon the contact with the surface of the body.

Here we present a case of burn injury due to high voltage transmission wire coming in direct contact with abdominal wall a child leading to burning of the abdomen, scrotum and penis.

Key Words: Electrocution, Burn, Abdomen, Penis

Introduction:

The invention of electricity proved to be a great boon to the human civilization. With time and the inventions based on electricity, almost whole of the mankind became dependent on it. Domestic use of electricity started with the invention on electric bulb, fans and other home appliances. With this, started the injuries and death from electric current. The first recorded death caused by electric current from an artificial source was reported in 1879, when a carpenter in Lyons, France, accidently came in contact with a 250-volt AC generator.

National crime records bureau data showed 10218 deaths from electrocution and that constitute 2.6% of all the accidental deaths, of which 0.7% were by lightning, which forms about 2833 cases. Self electrocution in India accounts for 0.7 % of the total suicides, that is 952 out of 134799 suicide deaths in the year 2013. Electrical injury is produced by the conversion of electric energy into heat while passing through tissue. Electrocution, though not very common, is often fatal. It can cause serious injuries and even permanent disabilities in survivors. Clinical manifestation can range from no apparent injury to serious systemic damage.

For wider understanding, electrical injuries are divided into high voltage (> 1000 V) and low-voltage (< 1000 V). Domestic supply is often of low voltage, whereas high voltage supply is usually to the industries. High voltage transmission of electricity is also used for the supply from substation to substation. From the substation it is converted to low voltage (250 volts) for the domestic supply. Most of the high voltage supply is through non insulated wires, which attract injury and accidents. Most of the time, poor maintenance of these wires and non favourable weather conditions lead to injury from broken wires.

High-voltage electrical trauma, which is more common in construction workers, involves a spectrum of lesions ranging from devastating soft tissue and neuromuscular injuries to potentially fatal outcomes such as respiratory arrest due to respiratory centre paralysis or respiratory muscle tetany. In general, the main pathologic characteristics are varying degrees of...
Jatropha curcas poisoning mainly through ingestion is becoming common now-a-days in countries like India, as there is global thrust for production of jatropha oil as an alternate fuel, i.e. biodiesel. Rampant farming of the plant is posing threat to humans for accidental poisoning. It produces the symptom of burning sensation in the mouth and throat followed by vomiting, diarrhea, abdominal pain, later dehydration and shock may lead to collapse of the patient. Most affected are children, as they are attracted by taste of fruits. Here, we present a case series of twelve children who ate Jatropha fruits and landed with above-mentioned signs and symptoms.

**KEYWORDS**
Jatropha curcas, Biodiesel, Cruciferae, Poisoning.

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**BACKGROUND**
Poisoning by eating fruits and seeds of Jatropha in children is not very often reported in Northern India. The plant often attracts children for its yellow fruits and sweet taste, though all parts of the plant are poisonous. Jatropha belongs to Euphorbiaceae family and is most widely available species. Different regions have different names for Jatropha, in India the various local names are bagherenda, jangli arandi and saled arand. J. Caracas has been used in traditional human medicine and for veterinary medicine for over a long period of time (Duke, 1985). In the past decade, interest in Jatropha seed oil for biodiesel production has propelled large scale J. Caracas plantations across Asia, Africa and South American countries.

The plant is about 2 - 3 metre tall and has heart-shaped green leaves (Fig. 1). The flower is small and white in colour and the fruits are initially green and yellow to brown on ripening. Fruit contains black seeds, which are often 2 - 3 in number and oval in shape. The seed contains kernels and shells, kernel contain high protein (22% - 28%) and oil (54% - 58%). Almost all parts of the plant are toxic including kernel, leaves, flowers, roots, buds and wood. It contains terpenes, lignans, alkaloids and cyclic peptides. Diterpenes derived from the plants has various activities like tumour promoting, anti-inflammatory, irritant, cytotoxic, anti-tumour, molluscidial, insecticidal and fungicidal activities.

On ingestion and the symptom starts with burning sensation in the mouth and throat followed by vomiting, diarrhea, abdominal pain, later dehydration and shock may lead to collapse of the patient.

**CASE SERIES**
We report cases of Jatropha poisoning presented to the J. N. Medical Hospital, Aligarh emergency with episodes of vomiting, diarrhea and pain in the abdomen.

There were twelve children and all of them were having similar symptoms. Immediately, they were transferred to the Paediatric Emergency Unit and the Forensic Medicine Unit was called upon for the medico-legal evaluation.

During evolution, it was revealed that children were between 6 - 11 years of age, of which 2 were girls, consumed a green coloured fruit from a plant from their locality following which vomiting, diarrhea and abdominal pain started. All the twelve patients were having signs and symptoms of dehydration, right from increased pulse rate, decreased blood pressure, cold extremities, sunken eye and dry tongue.

Fruit was brought by the parents with them and on inspection it was found to be of Jatropha (Fig. 2). Further on investigation, none of the parameters were found deranged including renal and liver functions. The patients were managed with IV fluids and symptomatically and were discharged later without any further event.

![J. Curcas Fruits with Leaves](image)
Doctors and Medico Legal Examination of Victims of Sexual Offenses

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Abstract

This increasing incident of crime against women is adding up to the number of female patients. This, along with normal female patients there is a dire emergency in the treatment of female victims of sexual assault. We need provision in our hospital set up to treat the victims separately. There is also an awareness campaign against the sexual crimes and the right of women. Thus increasing trend of crime against woman in India is also burdening the health system in providing treatment and medico legal work.

There are various steps in the general examination where the female patient though gives the consent, but do not welcome the moves of the doctor. This feeling often makes the patient uncomfortable and may compel the patient herself or relatives to bring charges of indecency and of sexual assault against the doctor. The casual attitude of doctors is not going to stand in the present scenario. There has to be strict and vigilant environment in our hospital as far as dignity and privacy of female is concerned. Woman friendly environments and attitude should reflect in our hospital.

Keywords: Rape, Medico Legal, Criminal law

Introduction

It has been observed that the crime against women is rising in the country and it also respects the data of the National Crime Records Bureau (NCRB) that 33,707 females were raped in 2013 as compared to 24,923 in 2012. It also shows that around 93 women are being raped every day [1].

Sexual assault is itself such a heinous crime that any of punishment is not sufficient to replace the damage that has been caused. The physical trauma heals, leaving behind the long term psychological trauma.

This increasing incident of crime against woman is adding up to the number of female patients. This, along with normal female patients there is a dire emergency in the treatment of female victims of sexual assault. We need provision in our hospital set up to treat the victims separately. There is also an awareness campaign against the sexual crimes and the right of women. Thus increasing trend of crime against woman in India is also burdening the health system in providing treatment and medico legal work.

As the new law against sexual offenses (The Criminal Law Amendment Bill, 2013) [2] defines and cover almost all aspects of crime against women. The new definition of rape [3] (Section 375 IPC) as per (The Criminal Law Bill, 2013) now includes even touching and manipulating genital organs, including the urethra and anus either by hand or any other object. With the amendment of the existing laws of sexual assault and rape, there is a great protection to the females in India. This law not even covers the simple act violence of against the female body, but even the smallest gesture that is leading to obscenity. Section 354 IPC 4 Now in all its section cover almost all the aspect assault of females that are sexual in nature.

Different sections of IPC 354 [2] cover sexual advances, showing pornography, making sexually colored remark, disrobing the female, capturing images or watching the female engaged in private act and stalking. Section 354 [2] has been often used against the doctors who are examining the patients in the process of making the diagnosis, treatment and follow up. Though consent and examination of the female are obtained, but it does not guard the doctor from the charges being brought upon under many sections of the law. There are various steps in the general examination where the female patient though gives the consent, but do not welcome the moves of the doctor. This feeling often makes the patient uncomfortable and may compel the patient herself or relatives to bring charges of indecency and of sexual assault against the doctor.
Lip Print: an Aid to Human Identification

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ABSTRACT
Among the various methods of identification, cheiloscopy is one of the most interesting emerging techniques. It is a method to establish the identity of a person based on the presence of grooves on the red part of human lips as various studies have revealed the unique nature of lip prints just like finger or footprints. Edmond Locard of France was the first to recommend the use of lip prints for individual identification. Since 1950, the Japanese has carried out extensive research in the matter. Lip prints at a scene of crime, apart from identification, may help to point as to the nature of crime, sex of the person involved, type of cosmetics used, habits or any pathological changes of lips. Credibility of lip prints as a human identification tool for evidential purposes is yet to be accepted by courts in India as literature reveals very little research done in this field. There is a need to review the various methods of recording and collection of the lip prints at the crime scene and also the means to develop the latent lip prints. This paper reviews in detail all the important aspects of cheiloscopy like its scope in crime investigation, limitations and current research carried out in this field.

Keywords: Cheiloscopy, Lip Prints, Identification, Latent Lip Prints

INTRODUCTION
Among the various identification data like anthropometric measurements, fingerprints, scar marks, etc. that help fix the identity of a person lip print study is another upcoming forensic science that’s gaining popularity as an identification aid for the individuality of a person. A Lip print is a characteristic pattern produced by the numerous elevations and depressions present on the red external surface of the lips. Lip prints are unique and permanent, i.e. does not change during the life of a person.¹,²,³

History
The anthropologist R. Fischer was the first to note and describe the presence of wrinkles and furrows on the human lip in 1902.⁴,⁵

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The criminologist, Edmond Locard, in 1932 emphasized the significance of lip print studies.⁶ Synder L, M, in 1950, described the possible role of using the lip prints as a tool of personal identification. Japanese scientists Suzuki and Tsuchihashi, during 1970 and 1974 in their studies demonstrated the hereditary character of lip prints. They devised a classification of six different types of grooves. It was observed that not even the uniovular twins had exactly the identical lip print patterns.⁵,⁶ Since 1985, in Poland, the methods of finding and recovery of lip traces, recovering comparative material, and techniques employed to carry out that expertise have been introduced into the casework of the fingerprint Department of the Central Forensic Laboratory of Police in Warsaw.⁷

Studying the lip prints
Lips are composed of skin, muscle, glands and mucous membrane. The mucosal area, also called Klein’s zone,¹⁰ is covered with wrinkles and grooves that form a characteristic pattern – the lip print. As shapes and size of lips differ among individuals, following four groups have been identified¹⁰.
Profile of Poisoning Cases in JNMCH, District Aligarh: A Prospective Study

Umar Bin Abdul Aziz, Mohd Kaleem Khan, Shaukat Arif Hanif, C B Tripathy

ABSTRACT

The availability of poisons and the deficiency of health services in the developing world is leading to a great economic and social set back. It has been found that easy access to large number of pesticides, rodenticides and other daily use chemicals and their ignorant use is leading to hazardous outcome in form of increased number of cases of poisoning related deaths. Recent industrialization and over use of insecticides has lead to an extensive proliferation of toxic chemicals. There is urgent need to devise mechanisms soon for strict regulation of availability and use of these chemicals. Other forms of poisoning includes over dose of prescription drugs such as hypnotics and anti-anxiety agents. Therefore there is need to put emphasis on regulation of dispensing these drugs over the counter and also developing newer antidotes for drug overdoses. With the above considerations there is need for further deepening our thought on prevention and regulation of drugs and chemicals.

The study conducted in our setup, which is placed in north central India shows poisoning cases in the young age group (20-30 years). The incidence of poisoning was found more in cases from the rural area than urban. Married person showed more incidence than unmarried. Manner of death being most commonly suicidal followed by accidental and homicidal poisoning. Aluminum phosphide showed the highest incidence as compared to other agents of poisoning.

Keywords: Poisoning, Suicide, Aluminium Phosphide

INTRODUCTION

Every day around the world around 700 people die from poisoning and many more suffer infirmities due to poisoning (WHO 1999). Agricultural poisoning cases are found in almost all regions of the developing world and in almost all the age and income groups. More than three million Poisoning cases occur world wide causing around 2,51,881 deaths annually. Almost 99% of the cases are found in the agricultural workers in the developing countries.

Suicidal and homicidal poisoning are more common in India due easy access to various poison such as insecticides, pesticides, industrial chemicals and pharmaceutical drugs. Accidental poisoning in children is now on an increase due to unrestricted access to all these agents in their surrounding environment. In developing countries must commonly self poisoning due to agricultural pesticides is seen. The first report of pesticide poisoning in India was from Kerala in 1958, where over 100 people died after consuming wheat flour contaminated with parathion. (ICMR Bulletin 2001)

In the rural China pesticide poisoning accounts for over 60% of the suicide cases. Similarly a high proportion of suicides are due to pesticides in rural area of Sri Lanka (71%), Trinidad (68%) and Malaysia (>90%). A Poisoning study in the United States reported an increase in mortality rate in cases of accidental poisoning from 1.9 to 2.3 deaths per 100,000 populations from 1985 to 1986. The common causes among adults were opiates and related narcotics as well as local anesthetic drugs. In south India a study during the period January 2005 to September 2008 showed that among 1045 cases of poisoning 68.40% cases to be intentional where 31.60% of the cases were accidental poisoning.

At UCMS & GTB hospital Delhi a study showed that 10.57% deaths were due to poisoning and most of the poisoning cases were either suicidal or accidental. The incidence was more in the 2nd decade of life.