

## MEDICO-LEGAL ASPECTS OF POISONING

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### ABSTRACT

In cases such as homicide, accidental or suicidal deaths the involvement of Poisons is always a probable cause. Poisons can be used to kill plants and animals. Forensic Science is involved with the deduction and identification of Poisons<sup>i</sup>. It is difficult to investigate cases in which poisons are involved. As extremely small quantities of poison can cause injury or even destroy, and be used in killing victims. The most poisons are easily accessible and available. They can be administered in minute quantities in food and drinks<sup>ii</sup>. Usually the Victim would have been poisoned by someone who has their confidence. Forensic Deals with the immediate cause of death and identification of aspects responsible<sup>iii</sup>. In Criminal Investigations Wherein Poisons are involved, Forensic Evidence is a very important factor which helps in Identification of the Perpetrator. This article deals with the topic by using four bases, Firstly, it deals with Poison as a cause of death, Secondly, symptoms exhibited by victims and Evidence Collected, Thirdly it deals with the Crime Scene Evaluations (establishing whether it was an homicide or an accidental or suicidal death), Lastly, The Medico-Legal Aspects involving the Medical reasoning in establishing a poisoning based death and the legal consequences of such poisoning if there was a perpetrator or if it was self-perpetrated will be discussed in this Research Paper.

**Keywords:** Poisons, Causes, Symptoms, Evidence, Crime Scene, Investigation, Medical Aspects, Legal Consequences.

## RESEARCH OBJECTIVES

- Aspects Such as Types of Poison, Dosage that could be administered to a Victim for intended effect, Factors which affect the Effect of Poison, and correlate it to the data obtained.
- To Study the Symptoms Shown by a Victim of Poisoning, A brief analysis as to how the Crime Scene is evaluated in Poisoning Cases (*Crime Scene Investigation*) to discuss the aspects of Forensic investigation in India and its holding in the court of law.
- An explanation on the Medical Reasoning in establishing a poisoning based death.
- The Legal Consequences of Administration of Poison to another. And Self-administration-based suicides and deaths.
- Discussion on case laws involved with Poisoning based deaths, thereby arriving to a conclusion in the court of law such as intention and identification of the perpetrator of the offence.
- The Restrictions imposed by the government on the sale of Poisons.
- Finally, establish that there need to be stricter regulations with respect to some toxins which are sold unregulated. The need to educate the common man on Poisoning and First aid.

## RESEARCH HYPOTHESIS

Poisoning is an important cause of death. It can be administered voluntarily by self, by influence or hypnosis or through a person who has the confidence of the Victim. The Symptoms of Poisoning in some cases is similar to that of illness or ailments. Forensic Science and the Study of Toxicology has a very important role in identifying the toxin or poison. The time period for which it has been administered and whether such substance had been administered forcefully. This article will discuss the deaths caused due to poisoning, the suspicious circumstances surrounding poison induced deaths which are made to look like those caused by ailments (in case of insurance frauds etc). Therefore, will study the common symptoms shown by victims, the legal consequences of administering poison to another.

## RESEARCH METHODOLOGY

The author has collected primary data from the NCRB Records<sup>iv</sup> as regards to Poisoning and Poisoning related deaths. The Segregation of such reports could be observed in types such as cause related, perpetrator based, punishment based and finally the period of occurrence of poisoning. Usually, Poisoning cases are treated as grounds for suspicious death and a detailed post-mortem report is made, to certify cause as to suicide or homicide. The Secondary Sources of Data are the Journals such as the Harvard Medical Review<sup>v</sup>, Books such as Forensics Aspects to Poisoning<sup>vi</sup>, Medical Toxicology: Diagnosis and Treatment of Human Poisoning<sup>vii</sup>, Dreisbach's Handbook of Poisoning<sup>viii</sup>. These books provided the insight needed to establish the proposed Hypothesis and in the correlation of data collected with relevant facts.

## REVIEW OF LITERATURE

The author primarily focused on the collection of data. So, NCRB Reports were more often referred to and all conclusions and suggestion are derived from such deaths caused due to poisoning. The first part of the research paper deals with forensic toxicology and toxins. The Scientific element attached to the toxins and their impact on the human body is discussed. Murari A, Sharma GK, A comparative study of poisoning cases autopsied in LHMC New Delhi and JIP-MER Pondicherry<sup>ix</sup>, has been the basis in arriving at conclusions in my research paper. From there I branched on to several articles in the Indian Forensic Medicine and Toxicology Journal. My Secondary Data the books I referred as mentioned earlier provided me with the relevant literature to base my research paper. I also provide much credit to Aggarwal P, Handa R, Wali JP<sup>x</sup>, Common Poisonings in India, J. Forensic Med. Toxicology, which helped me draw a lot of conclusions when it came to the several aspects involved in my research paper. Barry Levine, Ch-3 *Forensic Drug Testing*, in Principles of Forensic Toxicology<sup>xi</sup>, provided me with the necessary insight to start my paper and then decide as to where to proceed from where I had begun writing this paper.

## ANALYSIS

Toxicology is the branch in Medical Science that Specifically deals with Poisons, this is in relation to the Source, Characters, Properties and the Symptoms and Signs which such poisons produce on the Human Body, the lethal dose that can be administered, the nature of fatal results, the remedial measures that needs to be employed to combat the effects of such poisons and the methods of detection and estimation by correlating with the autopsy findings. This Study of Toxicology in Certain respects when it comes to the aspect of a Medical Practitioner deals with the law regarding sale and prescription of Poisons. In 1849, the first Chemical Examiners Laboratory was setup at than Madras presidency under the department of Health for the *detection of various poisons.*

## TYPES OF POISONS

There are three major types of Poisons namely, Corrosives, Irritants and Neurotics. Corrosives includes Strong Acids and Alkalis. Irritants are Inorganic, Organic and Mechanical elements. Neurotics are types of Poisons which have an effect on the Cerebral, Spinal or Cardiorespiratory systems. Narcotics, Inebriants and Deliriant affect the Cerebral System of the Body<sup>xii</sup>. Stimulants and Depressants affect the Spinal System. Cardiac and Asphyxiants affect the Cardiorespiratory tracts. In some cases, the dosage of Poisons could be so small they could go undetected without careful post-mortem analysis. And Poisoning cases can be deviant as to resembling ailments or some resemblance to illness<sup>xiii</sup>. Poisons are also used for treatment of diseases has it has healing properties which come with destroying a particular harmful element that is already causing harm to the body. The categories these drugs are available are drugs, industrial agents, agricultural pesticides and insecticides etc.

## FACTORS WHICH AFFECT THE EFFECT OF POISON

In the administration of Poisons, the effect they have on the Human Body differs based upon these factors. Such as the effect, either it is meant to cause death, temporary damage or in some cases the intended result could be to make a man lose his rational sense of reasoning and thought process<sup>xiv</sup>. The Dosage, the type and the form in which a poison is administered,

Hypersensitivity differs based upon the individual, for some persons something administered could be non-fatal but for a person with an allergy for a particular item administering it in major quantities could make it fatal, some combinations are incompatible and a concoction of such substances which are normal when consumed individually could be fatal when taken together, the tolerance of a particular person, cumulative action, mode of administration and the health and age of a person are the most common factors that are to be taken into consideration in the administration of Poison to another.

## **SYMPTOMS SHOWN BY A VICTIM OF POISONING**

Each Toxin affects the Human Body in a Particular way. The Symptoms shown vary from poison to poison. The Mayo Clinic has put forth a set of Sign and Symptoms to identify the case as one of poisoning at the facet which include, burns or redness around the mouth and lips, breath that smells like chemicals, such as gasoline or paint thinner, vomiting, difficulty in breathing, drowsiness and confused or other altered mental status<sup>xv</sup>.

## **ADMINISTRATION OF POISONS**

Poison can be administered in different ways to fulfil different purposes. It can be administered through enteral routes such as through intestinal routes and other routes such as the parenteral routes by means of an intramuscular injection. Poison can also come in contact with the body through other layers such as the mucous membrane (Respiratory Tract), eye, vagina, ear etc. Once administered Poisons tend to remain in the body in the form of essential metabolites for periods of time which may vary<sup>xvi</sup>. The Toxic symptoms of a particular toxin is observed when the substance is absorbed by the blood or organs and converts into an active metabolite which has a particular effect on the body. This causes damage to the body or organ. Sometimes it acts in such a way to disrupt the effective functioning of an organ to thereby cause death.

## CRIME SCENE INVESTIGATION

Firstly, the crime scene needs to be protected by safeguarding the location, photographing the scene of crime, directing the authorized persons away from the location, Police officer stationed at the scene to make sure it is not unguarded. Secondly, The Crime Scene needs to be properly photographed as it is a valid evidence in the court of law. This provides information which the naked eye might not be aware of or one might observe looking at in the first instance<sup>xvii</sup>. Thirdly, The Scene would need to be Sketched for reference. Sketches help in the depiction of the events that had taken place. Lastly, it should be ensured in a crime scene search case that the scene of crime is investigated thoroughly. All the details which are visible should be observed and explained before the expert moves on to dusting the fingerprints. This is most practical and begins when the body is first discovered<sup>xviii</sup>. All the above-mentioned techniques need to be followed in an ideal crime scene evaluation. And Especially in poisoning cases to evaluate whether there was use of force and this helps in the identification of the perpetrator of the offence.

## PENAL PROVISIONS

The Indian Law deals with aspects of Poisoning (related Crimes) to ensure there is a remedy and protective measure that is establish to prevent and deter such crimes. **Section 302<sup>xix</sup>** of IPC deals with Murder and also to homicides caused by poisoning. **Section 304 (B)<sup>xx</sup>** IPC deals with aspects of dowry death and the majority of Poisoning related deaths in both rural and urban India but predominantly the rural India are poisoning related deaths. **Section 174<sup>xxi</sup> of the CRPC**, deals with the procedure and protocol to be followed by the Police in regards to suicide. It deals with the aspect of doubtful death. **Section 327<sup>xxii</sup>** of the IPC deals with Voluntarily causing harm to exhort property. This provision also includes aspects of poisoning. **Section 323<sup>xxiii</sup> of IPC** also deals voluntarily causing hurt to another person and this is dealt with under section the Punishment is for about for a term of one year or fine of thousand rupees and can be both. **Section 284<sup>xxiv</sup>** of the IPC deals with the Punishment for the careless handling of Poisonous substances and **Sections 299, 302, 304 A, 306, 307, 309, 324, 328 and 489**. These Provisions deals with the offences related to the administration of poisonous substances. The Possession, Sale and Control of Poisons are governed in India by **The Poisons Act, 1919, The Drugs Act, 1940, The Drugs and Magic Remedies Act, 1954, The Narcotic Drugs and**

**Psychotropic Substances Act, 1985, and The Pharmacy Act 1984<sup>xxv</sup>**. Thus, it can be observed that Indian Law deals with the aspect of Poisoning from it causing Death to the aspect of injury or hurt. The laws are stringent and ensure that there are effective remedies to the Victim against the Perpetrator<sup>xxvi</sup>. There are also stringent laws to ensure that toxins and toxic substances are not sold in the market unregulated and some substances are made illegal under the several acts in India.

## IMPORTANT CASE LAWS

In *Poloniswamy v. State*<sup>xxvii</sup>, this case established the fact that the perpetrator who administered the poison and caused the death of an individual should be punished even when the Poison in the body could not be identified after investigation. If the guilt of such administration of poison is discovered by oral or circumstantial evidence that is valid for conviction in the court of law. In *Anant Chintaman Lagu v. State of Bombay*<sup>xxviii</sup>, it was held that to hold that a particular death was caused due to poisoning one needs to prove that (a) the death was due to a poison (or) poisons, (b) the accused had possession of the poison, (c) the accused had an opportunity to administer the poison to the deceased. Once the abovementioned facts are proved and also the fact that the accused had a motive for the same is made clear. The court can draw an inference which states that the poison was administered by the accused to cause the death of the victim. The court may provide the necessary judgment on the basis of the prosecution proving and establishing these facts. In *Mahabir v. State of Bombay*<sup>xxix</sup>, it was held that even if there are no characteristic signs which are noticeable on post-mortem examination when there exists no other conclusive reason for death and one of the symptoms of poisoning such as asphyxia is identified. The Poison as a cause of death should not be ruled out.

## ANALYSIS OF DATA

Poisoning is a Global threat to Public Health and welfare. In the list of unnatural deaths that occur world over poisoning is second to road accidents. A **2004 WHO** report stated that **346,000 people** died out of poisoning and **370,000** out that died due to **intentional poisoning**. The deaths may be suicidal, homicidal or accidental. But it accounts for a substantial number<sup>xxx</sup>. Poisoning is also an instrument in **suicide**. About one million people die every year due to

suicide. India is a predominantly agriculture country. There are a wide range of pesticides available in the Indian Markets<sup>xxxix</sup>. It is a requisite a proposal put through this paper to study the different genders, people of different age groups and different social structures to help the government bodies prepare mandates to reduce poisoning victims<sup>xxxix</sup>. Northern and Western India exhibit higher deaths due to poisoning. Aluminium Phosphate and other pesticides are widely prevalent in these areas. High rates of Poisoning in India is attributed to the availability of pesticides, cheap price, the fact action, immediate result, absence and immediate availability of antidotes to specific toxins in the Nation, lack of proper medical attention to victims.

**Self-Poisoning** is one of the important causes of death world over. Over **110,000-168,000** suicidal deaths each year and an estimated **371,000** deaths were related to poisoning based suicides **in the 2000's** was observed<sup>xxxix</sup>. In Rural Asian countries the availability of highly hazardous pesticides for agriculture is more easily accessible<sup>xxxix</sup>. It is reported by the WHO that most suicide attempts are not what that are well thought of but are made out of acute stress within **30 minutes** of making the decision. Suicide data is extracted from **1981 to 2015 NCRB** annual reports. A suicide is an unnatural and deliberate termination of life and this desire to die arises within an individual and that desire is the reason for ending life. NCRB records do not provide the details on how data on suicide are gathered. The Data obtained includes poisoning suicides. The **National Crime Records Bureau** has reported that in **441, 918** reported suicides in India from periods 1995 to 2015, **90.3 %** of them occurred in 11 of the 29 Indian States<sup>xxxix</sup>. The Indian government to control this aspect of poisoning has banned about 39 pesticides and 26 pesticides have been refused registration and the government has done this while adhering to the guidelines that have been set by the WHO. In 2015 the **NCRB** recorded **133,623** deaths out of which **23, 930** deaths were due to poisoning<sup>xxxix</sup>. Thus, from 1995 to 2015 out of a total **2,451,410** suicides **441,918** deaths were caused due to poisoning. And the most common method this was taken was in the form of pesticide toxin. In 2005 there was a hike in poisoning related deaths. This was followed by several governments banning different toxins. Such as the **2005 Kerala** government ban on Endosulphan<sup>xxxix</sup>. Although there has been a ban on several pesticides **the HHP** mentioned above has not altogether been eliminated. In Sri Lanka elimination of such **class I Toxins** led to reduction of poison related suicides to a great extent<sup>xxxix</sup>. Further it also remains a crime under **Section 309** of the IPC<sup>xxxix</sup>. This needs to change. India needs to eliminate all the pesticides which are high in toxicity and convert to



those with lower toxicity by initiating a total ban on the HHP class of toxins especially the pesticide variety<sup>xi</sup>.

The other class of Poison related deaths could be those administered in India in Property disputes and dowry deaths<sup>xii</sup>. There are about **0.3% to 3.7%** of ***Homicidal Poisoning Cases observed in India***. The most common poison group that was administered was the organophosphate<sup>xiii</sup>. ***Other Individual Poisons*** that were involved were aluminium phosphide, paraquat, arsenic, formalin and methanol. It should be noted in such cases both the sexes were equally involved upon data collected. In most cases the ***First-Degree Relatives*** were the perpetrators of such offences<sup>xliii</sup>.

The Data obtained by the author from the **NCRB Records and Autopsy Records** mentioned in ***Aggarwal et Al<sup>xiv</sup>***, the author arrives at the following factors which critically push a person to commit suicide. This is important in the Science of Forensics as we Derive these conclusions from the Data derived from poisoning based deaths from the autopsies.

## SEGREGATION OF DATA

### *Month and Season Wise*

Dash et Al, autopsy studies reveal that in 2010 the Maximum number of poisoning deaths was observed in April & October. The Least was in August and October. There were about 23 cases in Autumn and 16 in the Winter. Thus, the maximum number of cases were observed in the Summer<sup>xlv</sup>. However, ***Mohanty et Al<sup>xlvi</sup>***, states that the lesser number of cases were observed in winter in comparison to summer. As it is the season when they start to farm and thereby the easy availability of the pesticides.

### *Sex Wise*

Males were observed to outnumber females in 2012-2013 Study. As a male is actively engaged with the society and thus is more exposed to hazardous substances, acute stress and unhealthy working lifestyles in comparison to females<sup>xlvii</sup>.

### *Age Wise*

For males more poisoning cases was observed in the age group of 21-30 and for females it was 31-40<sup>xlviii</sup>. It is because it is the respective periods in the age groups of males and females where both of them have a tendency to take undue risk, they begin to face mental, psychological, social and physical stress.

### *Marital Status Basis*

The Suicidal Rates in India it was observed that most married men and unmarried women had a higher tendency to commit suicide<sup>xlix</sup>.

### *Poison Basis*

Meena et Al, states that the tendency to use a particular kind of poison came with the aspect of its availability and the rash decision for a painless death<sup>l</sup>.

**From the Data** collected and the inferences that have been made, we can conclude that only on the identification of the potential causes to suicide and poisoning based deaths can they be tackled. The three major causes of Poisoning based deaths were (a) accidental, (b) Suicidal / Intentional and (c) Homicidal. The aspect of homicidal poisoning cases is strictly dealt with in the country and extremely stringent punishments are made in such cases<sup>li</sup>.

### *Perpetrator Identification in Poisoning Based Deaths*

In India autopsy is performed mandatorily for all poisoning based deaths. The blood and Viscera are sent to the Regional Forensic Science Laboratory for chemical testing. The toxicology analysis is performed through thin lawyer chromatography and colour tests<sup>lii</sup>. This record confirms the poisoning and helps in identification of the toxin involved and the police usually identify the suspect who usually has a motive which is apparent if there was any suspicious finding in the report. And they manipulate the obtained evidence in such a way as to arrive at the answer as to who might be the perpetrator. In poisoning based deaths, it is difficult to immediately arrive at the perpetrator of the offence but on detailed analysis that can be arrived at.

### *Legal Restrictions Imposed on the Sale of Toxins*

There are several acts implemented to check the sale of toxins and other substances. The Toxic Substances Control Act of 1976 is one of them<sup>liii</sup>. Also, The Pollution Prevention Act of 1990 is also extremely important it focuses on the cost-effective changes in production, operation and raw material use. The Other acts involved to restrict unregulated sale of toxins in India are The Poisons Act, 1919, The Drugs Act, 1940, The Drugs and Magic Remedies Act, 1954, The Narcotic Drugs and Psychotropic Substances Act, 1985, and The Pharmacy Act 1984.

## CONCLUSION

In India more than **50,000 people** die due to toxic exposure. The cause of such poisoning could be intentional, self-perpetrated, homicidal, accidental or deliberate<sup>liv</sup>. To ascertain the root cause of such happenings forensic toxicology is extremely important from the Indian viewpoint. In the 21<sup>st</sup> Century the study of Forensic Toxicology has become intellectually demanding in several aspects. Its role in solving criminal cases cannot be denied. The decisions that the courts arrive at in such situations and the society, is highly dependent on Forensic Examination and its reports. Crime is ever changing, there are new deviances that are seen, to tackle it there must be an effective law enforcement mechanism<sup>lv</sup>. Forensic Toxicology is a part of that enforcement mechanism<sup>lvi</sup>. Thus, it is extremely important to use this modern technique in analysing the presence of a toxin in the body during autopsy and other procedures. As a part of the research conducted data segregated and made into different categories upon the authors suggestions, these point to a common set of suggestions that are put forth by the author which could help in (a) Effective implementation of Forensic Toxicology in the country, (b) lower suicides which are poison related, (c) Identification of Difference between Poison Suicide and Homicide, (d) Aspects related to the regulation of the Sale of Toxins.

### *a) Effective implementation of Forensic Toxicology in the country*

- i. Better Equipment and Trained Professionals.
- ii. Measures implemented to help investigators to Identify the presence of Toxin in the Human Body at the Pre-set of the investigation.
- iii. Proper handling of the Crime Scene.
- iv. A video recording of the autopsy conducted along with findings.

- v. Efficient methodology to identify toxins.
- vi. More importance should be given to this branch in the Medical Field.
- vii. The Duties of the Medical Practitioner should be highlighted. He should be stringent and strict while prescribing doses to different patients.

**b) Lower suicides which are poison related**

- i. In Order to achieve lower poison related suicides in the country, the government should ensure that there is a check on the ease of availability of such toxins.
- ii. The Government Should make sure that the common man does not get access to hazardous substances.
- iii. To prevent accidental poisoning the government should make stringent rules to Industries to protect their employees and also regarding the hazardous solid, liquid and gaseous emissions from such factories and industrial sectors.
- iv. Have a efficient Suicide Helpline.
- v. Ban the Class I Pesticides as Released by the WHO. Sri Lanka Followed these measures and the Suicide rate had reduced about 60 percent.
- vi. Educate the Common man, children and adults regarding the effects of toxins and harmful concoctions.

**c) Identification of Difference between Poison Suicide and Homicide**

- i. The Police need to check for suspicious circumstance surrounding a person's death.
- ii. A list of the persons immediate beneficiaries and relatives needs to be made.
- iii. There should be thorough crime scene investigation.
- iv. All obtained information should be viewed in all the ways. Suspicious death, due to poisoning should be immediately investigated into.

**d) Aspects related to the regulation of the Sale of Toxins.**

- i. Narcotic substances are banned but are being consumed without any supervision. There needs to be an effective mechanism to ensure that this is not the scenario.
- ii. When Substances such as pesticides are being distributed the purpose for such distribution should be noted down.
- iii. The government should handle and control all substances hazardous to human health.
- iv. Mental Health issues should be given importance at the workplace.

To conclude my paper involves several aspects on Forensic Toxicology, intentional and unintentional deaths caused my poisoning. The Suggestions put-forth are those of the authors understanding and inferences arrived from after thorough research on the abovementioned topics.

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