

## ORIGINAL ARTICLE

# Pattern of Drug Poisoning cases reported in Poison Detection Centre at Tertiary Care Hospital, Belgaum

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## Abstract:

The trend of reported drug overdose cases in Poison Detection Centre is a critical area of research that sheds light on the prevalence, distribution, and specifics of cases of drug poisoning. Drug toxicity is a major problem for the public health that has an impact on all ages and socioeconomic groups. This study's objective is to evaluate the trends in drug poisoning cases that have been reported to the Poison Detection Centre by examining the types of drugs involved and the demographics of the affected individuals. The findings of this study will provide valuable insights into the current trends and patterns of drug poisoning cases, which can help in making informed policy decisions and guide interventions to prevent and manage drug poisoning incidents. In this study, retrospective analysis of 315 drug poisoning cases were performed. Information was collected from cases reported between January 2010 and December 2021. Microsoft Excel ® 2021 was used for analysis and the results were calculated in percentages. The study found that sedative-hypnotics like benzodiazepines and analgesics like paracetamol (acetaminophen) were the most used drugs. The current data may not accurately depict the prevalence of poisoning in India, but it does show a general trend. The Poisons Information Centre is crucial in informing doctors about commonly used, abused medications so that they are aware of them before prescribing them.

**Keywords:** Clinical toxicology; Drug poisoning; Drug monitoring; Overdose; Poison detection centre; Prescription drug abuse; Toxicology.

## Introduction:

Drug poisoning is a serious medical emergency that can be caused by either an intentional or unintentional misuse of drugs. It can occur with both legal, prescribed medications as well as illicit drugs. Risks of poisoning have increased significantly over the past few decades because of the easy accessibility of pharmaceuticals. Higher doses of drugs taken orally or intravenously can cause poisoning or even death.<sup>1</sup> The second-leading cause of morbidity globally is acute poisoning.<sup>2</sup> Over the past ten years, drug overdose mortality has significantly increased in several nations around the world. Each nation experiences distinct poisoning pattern. There may be a significant relationship between social, cultural, and religious factors and the origin of poisoning.<sup>3</sup> Drug overdose is a medical emergency for which it's critical to determine the incidence, pattern, and outcome in order to make the appropriate plans for strict management. Overdose from drugs is a significant but poorly understood public health issue. Drug overdoses were once considered to be a problem with substance addiction or law enforcement rather than a public health issue. Public health specialists have, however, grown more interested in the subject and in minimising the burden that unintentional overdoses place

on society because of the rise in the use of legal prescription medicines.<sup>4</sup> There are two significant ways that accidental drug overdoses vary from other causes of morbidity and mortality. First, drug users rarely overdose alone, and unintentional overdose deaths are unusually rapid. Hence, the majority of overdose deaths can be prevented. For instance, those who perceive an overdose situation able to access first aid and call for emergency services.<sup>5</sup> Secondly, drug availability is inextricably linked to drug overdoses as a necessary factor in overdose, in particular.<sup>6</sup> In the case of drug poisoning, it is important to identify the type and amount of drug taken, as well as the time frame in which it was taken, in order to provide appropriate medical care considering that overdose can be avoided and is influenced by one's surroundings. Community health ought to be concerned about drug overdoses from the perspectives of understanding their causes and promoting interventions to lessen their effects. Treatment for drug poisoning depends on many factors such as the type and dose of drug consumed. Treatment plans typically involve supportive therapies such as airway management, hydration, fluid replacement therapy, and monitoring of breathing rate and oxygen levels. It is important for healthcare professionals to stay abreast of emerging trends in drug poisonings so they can be adequately prepared to take proper action whenever an incident arises. To be able to treat patients effectively, when necessary, medical professionals must stay informed about the problems associated with drug poisoning. This study's objective is to offer pertinent data on the patterns of drug poisoning cases that have been reported to the Poison Detection Centre of Belgaum's Dr. Prabhakar Kore Charitable Hospital.

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## Materials and methodology:

After obtaining ethical approval from the Institutional Ethics Committee the analysis was conducted out. The current study was carried out for a period of, at Belgaum District, Karnataka state which is in Southwestern region of India. Figure 1 displays the study area. Data were collected retrospectively for this study includes information about all the drug poison samples analysed at Poison Detection Centre (PDC) that is reported from the Tertiary Care Hospital. Cases which were referred from nearby Hospitals to the central hospital were also considered. Age, sex and the names of drugs taken were included in the study's data collection on the pattern of poisoning from records of poison detection centre. In total 315 case histories were studied to uncover pattern of poisoning in the region. Based on the total cases reported for each class of Drugs along with the patient's age gender, the frequencies of the incidence of poisoning in each year were calculated. Relevant information was gathered and entered in Microsoft Excel using a standardized proforma. In this study, drugs linked to poisoning incidents were categorised based on their therapeutic group. Microsoft Excel 2021 was used for analysis and the outcomes were calculated as percentages.

## Results:

In total, 2038 suspected poisoning cases were reported, 315 of which were drug-related, available for analysis. Figure 2 illustrates the year-wise distribution of cases. Between 2016 and 2020, drug poisoning cases shows varied patterns. Age wise distribution of poison is mentioned in Figure 3. 107 (34%) Poison cases were reported from age group between 21-30 years of age, 75 (24%) is between 11-20 years of age, 67 (21%) is between 31-40 years of age, 26 (8%) is between 41-50yrs of age, 13 (4%) is between 51-60yrs of age & 9 (3%) is reported in 61-70, 9 (3%) <10yrs & >70 years of age each. Majority of cases were reported between 21 – 30 years of age and less cases were reported from person with either more than 70years or less than 10 years. Males (60%) were reported more than Females (40%) which is represented in the Figure 4. The common groups of drugs reported in PDC in decreasing order of frequency were Sedative-Hypnotics (61%), NSAID (9%), Antidepressant & Antipsychotics (4%), Antihistaminic, Iron & Amlodipine (3%) each, Betablockers (2.5%), Antiepileptics (2%), Antidiabetic (1.5%), Phenol, Domperidone, PPI & Calcium (0.6%) each & Remaining drugs of 0.3% which is mentioned in Figure 5. Among Sedative-Hypnotics, Benzodiazepines (88%) are most reported followed by Phenobarbitone (10%) & non-Benzodiazepines (2%) are mentioned in Figure 6. Among NSAID, Paracetamol (71%) was reported most common followed by COX 2 inhibitor (14%), Non selective COX inhibitor (11%) & Preferential COX inhibitor (4%) is mentioned in Figure 7.

## Discussion:

The intentional or unintentional consumption of chemicals that are harmful to a human's body would represent drug poisoning. In our research, the number of drug poisoning cases varies by year, more cases were reported in 2016 (13%) and least in 2014 (4%). Males (60%) predominated over Females (40%) at the ratio of 1.5:1 which in convergence with the national and global findings. A possible explanation to these findings can be the easy exposure

of males to poisoning agents & males are more prone to the stress which may lead to the suicidal use of poisoning agents.<sup>7</sup> It is found to be similar to the research done by Zia et al.,<sup>8</sup> Issa et al.,<sup>9</sup> Singh et al.,<sup>7</sup> Prajapati et al.,<sup>10</sup> Kumar and Reddy,<sup>11</sup> Maskey et al.,<sup>12</sup> Aatika et al.<sup>13</sup> Minor increments were reported by Jalali et al.<sup>14</sup> and Hameed et al.,<sup>15</sup> Jaikhani et al.<sup>16</sup> certain studies have also reported more number of poisoning cases in females.<sup>17-19</sup>

The greatest proportion of cases in the current study were between 21-30 years old (34%) followed by between 11-20 years old (24%) between 31-40 years old (21%), while the age groups with the lowest percentage of patients were under 10 years old and over 70 years old. It is so because, a person will be more energetic and also has more hard times when they are between the ages of 21 to 40 years of age. This finding is also supported by the studies that have been done by Gupta et al.,<sup>20</sup> Dash et al.<sup>21</sup> and Srivastava et al.,<sup>22</sup> Singh et al.,<sup>7</sup> Liu et al.,<sup>23</sup> Escoffrey and Shirley,<sup>24</sup> Meel,<sup>25</sup> Sandhu and Dalal,<sup>26</sup> Batra et al.,<sup>27</sup> Dash et al.,<sup>28</sup> Nigam et al.,<sup>29</sup> Garg and Verma.<sup>30</sup> The Sedative Hypnotics group (61%) has more drug toxicity reports followed by NSAID (9%) compared to all other groups. Benzodiazepines (88%) were reported more often than other sedative hypnotics & Paracetamol (71%) is most reported among NSAID. This finding is in accordance with various studies like Babys et al.,<sup>31</sup> Dash SK et al.<sup>32</sup>

From this, it can be inferred that benzodiazepines are routinely prescribed medications for the treatment of insomnia and also as anticonvulsants. NSAID are widely found as over-the-counter medication, hence lack of knowledge and the easy accessibility of drugs attributed to this issue. Medical practitioners should also take the initiative to remain knowledgeable and up-to-date on the risks of drug poisoning as it is a serious and fatal condition. Practitioners should work to understand how medications influence the body, including the toxicity of certain substances and interactions between various substances. They should also be aware of the possible antidotes or remedies for medication overdoses so they are ready to offer the necessary medical care whenever required. Additionally, practitioners must familiarize themselves with ways to ensure safe storage and disposal of these potentially dangerous substances in order to reduce unintentional overdose exposures. These results are a reminder that regulatory guidance on decisions regarding the transfer from prescription to over-the-counter medications needs to be developed.

## Conclusion:

Drug poisoning is an increasingly prevalent problem across all demographics. In particular, our study revealed that there is an alarming rise in the number of poisonings associated with anti-anxiety medications and NSAID among young and middle-aged adults. The results of this study highlight the need for increased public health education and awareness about medication safety, as well as more stringent healthcare guidelines regarding prescription drug monitoring, in order to protect individuals from potentially dangerous drug interactions and misuse.

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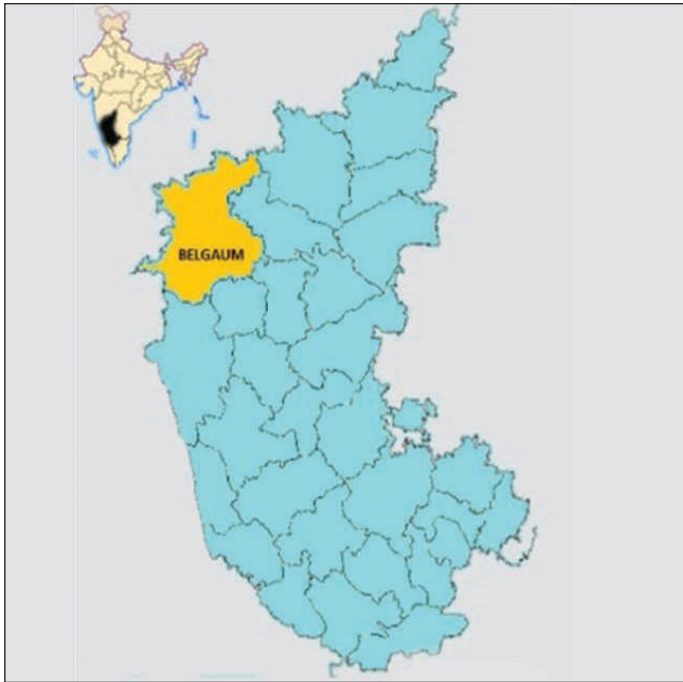


Figure 1. Illustration of Study Area. The figure depicts the study area for the research conducted in this study. The study area is represented by a geographical map, showcasing the relevant geographic features and boundaries.

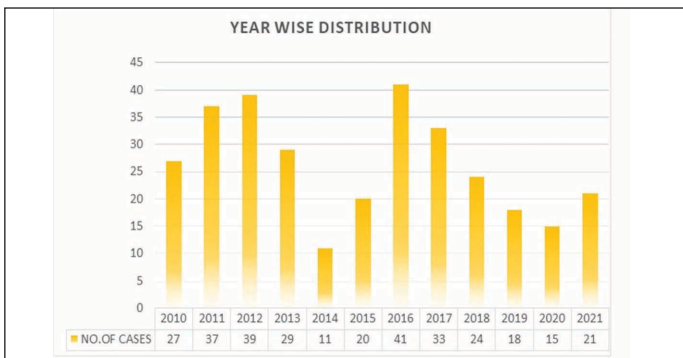


Figure 2. Cases of drug poisoning distributed by year. The figure presents a bar graph depicting the annual distribution of drug poisoning from 2010-2021. The X-axis represents the years. Y-Axis represents the number of drug poisoning cases recorded during each year. Each bar on the graph represents the number of cases reported in a specific year.

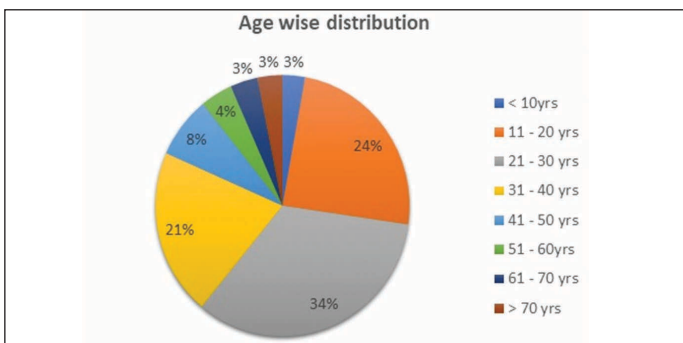


Figure 3. Age-based distribution of cases of drug poisoning. The pie chart provides a visual representation of the proportion of cases within each age category.

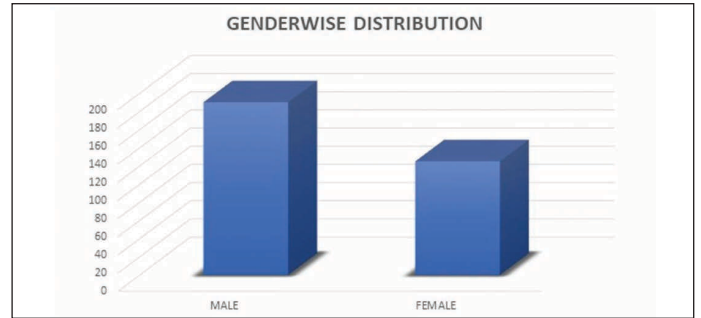


Figure 4. Distribution of drug poisoning cases based on Gender. The figure presents a bar graph depicting the distribution of drug poisoning cases based on gender.

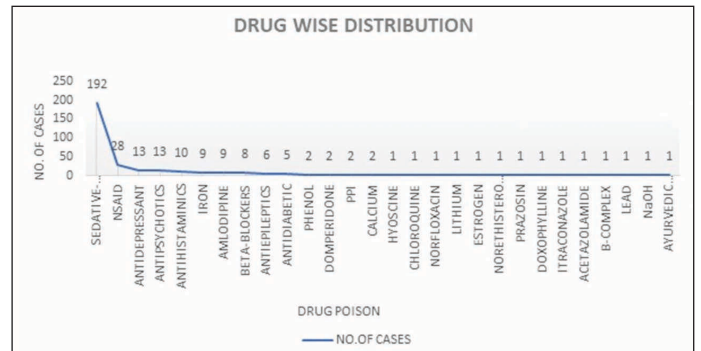


Figure 5. Distribution of drug overdose cases as per the substance consumed. The figure presents a line graph depicting the distribution of drug overdose cases based on the specific substances consumed. X-Axis represents the substances consumed in drug overdose cases. Y-Axis represents the number of drug overdose cases associated with each substance.

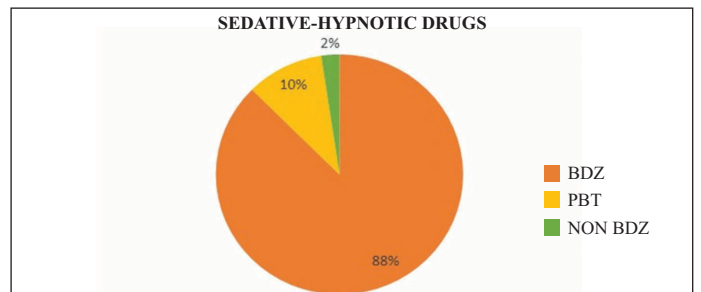


Figure 6. Number of drug poisoning cases with sedative-hypnotics ingested. The pie diagram provides a visual representation of the proportion of cases attributed to sedative-hypnotic ingestion out of the total drug poisoning cases.

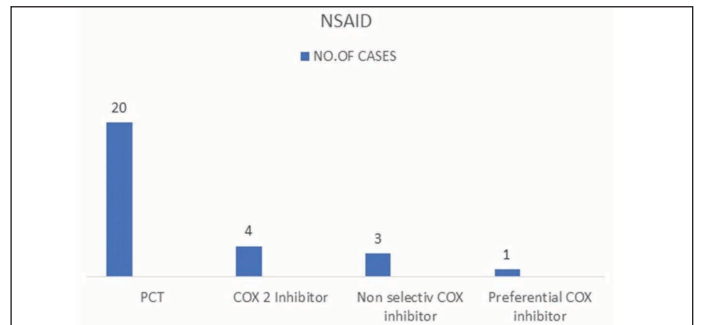


Figure 7. Number of drug poisoning cases with NSAID. X-Axis: The horizontal axis represents the specific NSAIDs involved in the drug poisoning cases. Y-Axis: The vertical axis represents the number of drug poisoning cases attributed to each NSAID.

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