Original Article

STUDY OF AUTOPSY FINDINGS IN CASES OF ACUTE POISONING
Dr. SB Datir, Dr. M Petkar, Dr. JM Farooqui, Dr. CS Makhani, Dr. SN. Hussaini,
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STUDY OF AUTOPSY FINDINGS INCASES OF ACUTE POISONING
Dr. SB Datir, Dr. M Petkar, Dr. JM Farooqui, Dr. CS Makhani, Dr. SN. Hussaini,
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Abstract
This hospital based prospective cross sectional study was carried out over a period
of two years duration from 01/09/2008 to 31/08/2010 in the Rural Medical College and
Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni, Taluka Rahata,
Ahmednagar (M.S) India to study characteristic external and internal postmortem
examination findings of acute poisoning cases. All cases of acute poisoning brought for
postmortem examination which was either brought dead or died during treatment with history
of acute poisoning or known and unknown bites and stings were included in the study.
Comprehensive proforma for the study was designed which containing the external and
internal findings of postmortem examination.

During the study period, total 62 fatal cases of acute poisoning were recorded. Froth
or secretion at mouth and nostrils was the predominant external autopsy finding which was
followed by characteristic odor from mouth. Most common internal autopsy finding was
inflammation and congestion, petechial hemorrhages of mucosa of the stomach. Congestion
of organs, cerebral and pulmonary edema were the common internal autopsy finding in
poisoning cases. Stomach contents revealed kerosene like odor in maximum number of cases
followed by garlicky odor and acetone like odor.

Keywords: Postmortem findings, Autopsy findings, Acute poisoning, Snake bite & sting.

Introduction:
Poisons have been the subject of curiosity since ancient times. Their systematic study
is traced to the 16th century. Traditionally, arsenic has been the favorite for homicide and
opium for suicide, though there has been an increasing incidence of use of organophosphorus
insecticides for suicide. In India, due to the relative ease with which poisons are available,
naturally or in the market, cases of human poisoning are commoner than they are in the
West. Frequently reported mortality of snake bite in India alone is over 15,000 per
annum and rising rates of snakebite deaths have been reported by WHO in India and Sri
Lanka, where large jungles were torn down to make new hydroelectric projects or the
highways.

Various external and internal postmortem findings are likely to be the key
determinants to identify acute poisoning cases and to rule out cause of death, hence it is of
critical importance that these factors be firmly established. Hence the present study is
undertaken with the aim to study characteristic external and internal postmortem examination
findings of acute poisoning cases which is necessary for the purpose of identification of
poisoning as a cause of death. The recognition of poisoning is a matter of first importance
from the point of view of the medical jurist whose duty is to help in unmasking the culprit. So
acute poisoning is of special interest to the medical jurist.

The results of this study will help the medical officers to know the common external
and internal postmortem findings to look for in cases of acute poisoning which in turn will
help the judiciary for proper disbursement of justice.
Materials and methods:

This hospital based prospective cross sectional study was approved by Institutional Ethics and Research committee of Pravara Institute of Medical Sciences (PIMS), Loni and carried out over a period of two years duration from 01/09/2008 to 31/08/2010 in the Rural Medical College and Pravara Rural Hospital, of Pravara Institute of Medical Sciences, Loni, Taluka Rahata, Ahmednagar (M.S) India, which is a tertiary care teaching hospital chiefly catering to the demands of rural area of Ahmednagar & adjacent districts of Maharashtra.

All cases of acute poisoning brought for postmortem examination which were either brought dead or died during treatment with history of acute poisoning or known and unknown bites and stings were included in the study. All cases of chronic poisoning, brought dead cases without history of acute poisoning and bites and stings were excluded from the study.

Comprehensive proforma for the study was designed which contained the external and internal findings of postmortem examination. External findings which were included are the presence of odor from mouth, froth or secretions at mouth and nostrils, stains around lips and nostrils, cyanosis, soiling of clothes with vomitus, subconjunctival hemorrhage, bite/sting mark, signs of inflammation at the site of bite/sting mark and corrosions around oral cavity. The internal examination included examination of the gastrointestinal tract and other organs.

Relevant data of the individual poisoning cases was collected from medicolegal cases register of casualty, case papers from concerned department, inquest, post-mortem reports, chemical analysis report after taking informed consent from patient or relatives. Then the data was registered in a master chart. Data was statistically analyzed using statistical software SPSS Statistic 17 and Microsoft Office Excel 2003. Data was analyzed in the form of percentage (%) and proportion. Observations were presented in the tabular form.

Observations and Results:
During the study period, total 62 fatal cases of acute poisoning were recorded.

Table No. 1: Distribution of external postmortem findings in fatal cases of acute poisoning. (n=62, Multiple response)

<table>
<thead>
<tr>
<th>External Postmortem Findings</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristic odor from mouth</td>
<td>28</td>
<td>45.16</td>
</tr>
<tr>
<td>Froth or secretions at mouth and nostrils</td>
<td>37</td>
<td>59.68</td>
</tr>
<tr>
<td>Stains around lips and nostrils</td>
<td>22</td>
<td>35.48</td>
</tr>
<tr>
<td>Cyanosis</td>
<td>19</td>
<td>30.65</td>
</tr>
<tr>
<td>Soiling of clothes with vomitus</td>
<td>13</td>
<td>20.97</td>
</tr>
<tr>
<td>Subconjunctival Hemorrhage</td>
<td>01</td>
<td>01.61</td>
</tr>
<tr>
<td>Bite/Sting mark</td>
<td>06</td>
<td>09.68</td>
</tr>
<tr>
<td>Signs of inflammation at the site of bite/sting mark</td>
<td>06</td>
<td>09.68</td>
</tr>
<tr>
<td>Corrosion around oral cavity</td>
<td>01</td>
<td>01.61</td>
</tr>
</tbody>
</table>

Table No.1 reveals that out of 62 fatal cases of poisoning froth and secretion at mouth and nostrils was the predominant external autopsy finding in 37 (59.68%) cases which was followed by characteristic odor from mouth in 28 (45.16%) cases. Stains around lips and nostrils were found in 22 (35.48%) cases, cyanosis in 19 (30.65%) cases, soiling of clothes by vomitus in 13 (20.97%) cases. Subconjunctival hemorrhage and corrosion around oral cavity
was seen in 1 (0.16%) case each. Bite/sting marks and signs of inflammation at the site of bite/sting marks were found in 06 (09.08%) cases.

Table No. 2: Distribution of internal postmortem findings in fatal cases of acute poisoning. (n=62, Multiple response)

<table>
<thead>
<tr>
<th>Organs</th>
<th>Corrosion</th>
<th>Petechial hemorrhage</th>
<th>Inflammation and Congestion</th>
<th>Softening</th>
<th>Ulceration</th>
<th>Perforation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No  %</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
<td>No %</td>
</tr>
<tr>
<td>Esophagus</td>
<td>1 1.61</td>
<td>4 6.45</td>
<td>56 90.32</td>
<td>1 1.61</td>
<td>01 1.61</td>
<td>1 1.61</td>
</tr>
<tr>
<td>Stomach</td>
<td>1 1.61</td>
<td>26 41.94</td>
<td>60 96.77</td>
<td>1 1.61</td>
<td>03 4.84</td>
<td>1 1.61</td>
</tr>
<tr>
<td>Small intestine</td>
<td>1 1.61</td>
<td>7 11.29</td>
<td>43 69.35</td>
<td>0 0.00</td>
<td>01 1.61</td>
<td>1 1.61</td>
</tr>
<tr>
<td>Large intestine</td>
<td>0 0.00</td>
<td>3 4.84</td>
<td>07 11.29</td>
<td>0 0.00</td>
<td>00 0.00</td>
<td>0 0.00</td>
</tr>
</tbody>
</table>

Table No.2 depicts that most common internal autopsy findings were inflammation and congestion of mucosa of the stomach [60 (96.77%)] followed by esophagus [56 (90.32%)], small intestine [43 (69.35%)] and large intestine [07 (11.29%)]. Least common autopsy findings were corrosion of mucosa of esophagus, stomach and small intestine, softening of mucosa of the esophagus and stomach, ulceration of mucosa of esophagus and small intestine and perforation of esophagus, stomach and small intestine which were found in only 1 (01.61%) case each.

Petechial hemorrhages were found on mucosa of the stomach in 26 (41.94%) cases followed by small intestine in 7 (11.29%) cases, esophagus in 4 (06.45%) cases and large intestine in 03 (04.84%) cases. Softening of mucosa was found only in the esophagus and stomach in 1 (01.61%) case each. Ulceration was found mostly in the mucosa of the stomach in 3 (04.84%) cases followed by esophagus and small intestinal mucosa in 1 (1.61%) case each. Perforation was found in esophagus, stomach and small intestine in 1 (01.61%) case each.

Table No.3 reveals that the maximum cases were reported with congestion of meninges & brain [61 (98.39%)] followed by spleen and kidneys in 60 (96.77%) cases each. In 59 (95.16%) cases the liver and in 58 (93.55%) cases lungs showed congestion.
Table No.4 shows that edema of brain was reported in 61 (98.39%) cases and edema of lungs in 47 (75.81%) cases. Petechial hemorrhages were present in brain in 13 (20.97%) cases and in lungs in 08 (12.90%) cases.

**Table No. 5: Distribution of odor from mouth and stomach with its contents in fatal cases of acute poisoning. (n=56)**

<table>
<thead>
<tr>
<th>Odor</th>
<th>Mouth</th>
<th>Stomach with its contents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Kerosene like</td>
<td>26</td>
<td>46.43</td>
</tr>
<tr>
<td>Acetone like</td>
<td>02</td>
<td>03.57</td>
</tr>
<tr>
<td>Garlicky</td>
<td>00</td>
<td>00.00</td>
</tr>
<tr>
<td>Absent</td>
<td>28</td>
<td>50.00</td>
</tr>
<tr>
<td>Total</td>
<td>56</td>
<td>100</td>
</tr>
</tbody>
</table>

*Out of 62 fatal cases 6 cases of snake bite were excluded for this table.

**Discussion:**

During the study period, total 557 cases of acute poisoning were recorded. Thereafter all the details of the findings of individual examination were noted and statistically analyzed. The results of the present study were compared and discussed with available literature of other similar studies in India and abroad.

Finding that froth or secretions at mouth and nostrils in 59.68% cases of the present study, as observed in Table No.1 were similar to study done by Job C[^4^] and Zariwala RC[^5^] (after calculation) who reported froth from the mouth in 63.28% cases and 35.94% cases respectively. PillayVV[^6^] reported characteristic odor from mouth and cyanosis to be a common external autopsy findings which were consistent with the present study. In spite of extensive search we could not find other comparable findings like stains around lips and nostrils, soiling of clothes by vomitus, subconjunctival hemorrhage, corrosions around oral cavity in studies done by other authors. *(Table No.1)*

Findings of the present study i.e. inflammation and congestion of mucosa of the stomach in 96.77% cases and corrosions in 1.61% cases as observed in Table No.2 were comparable to study done by Job C[^4^] who reported most common finding to be gastric mucosal congestion in 76.33% cases and corrosion to be 05.59% cases. In spite of extensive search, we could not compare other findings like petechial hemorrhages, softening, ulceration and perforation of mucosa of esophagus, stomach, small and large intestine in the present study with other studies due to non availability of such findings in studies done by other authors. *(Table No.2)*

In spite of extensive search we could not compare findings in Table No.3 in the present study with other studies due to non availability of organ wise variation of congestion in studies done by other authors. PillayVV[^6^] reported congestion of organ to be common internal autopsy finding in poisoning cases which is comparable to our study. *(Table No.3)*

Finding of pulmonary edema in 75.81% cases as observed in Table No.4 in the present study was comparable to study done by Job C[^4^] who reported pulmonary edema to be in 90.16% of poisoning cases. PillayVV[^6^] reported cerebral and pulmonary edema to be common internal autopsy finding in poisoning cases which was observed in 98.39% and 75.81% cases respectively in our study. In spite of extensive search we could not compare findings of cerebral edema and organ wise variation of petechial hemorrhages in the present
study with other studies due to non availability of such findings in studies done by other authors. (Table No.4)

Our finding i.e. kerosene like odor from stomach and its contents in 83.93% cases of poisoning as observed in Table No.5 was in contrast with finding of the study done by Zariwala RC[5] who reported that kerosene like odor of stomach contents to be in 1.80% cases and this may be due to fact that that author classified another category of odor as insecticide which included 46.40% cases which were commonly of insecticide poisoning and usually contains solvent as petroleum derivative such as aromax which has kerosene like odor. Our study finding of acetone like odor in 3.57% cases was comparable with the study done by Job C[4] who reported it to be in 06.38% cases. In spite of extensive search we could not compare distribution of odor from mouth due to non availability of such finding in the studies done by other workers. (Table No.5)

Conclusion:
The study was conducted over the period of two years duration from 01/09/2008 to 31/08/2010. During the study period, total 62 fatal cases of acute poisoning were recorded.

1. Froth or secretion at mouth and nostrils was the predominant external autopsy finding which was followed by characteristic odor from mouth. Stains around lips and nostrils, cyanosis, soiling of clothes by vomitus, bite / sting mark and signs of inflammation at the site of bite/sting mark were common external autopsy findings in cases of poisoning.
2. Most common internal autopsy finding was inflammation and congestion, petechial hemorrhages of mucosa of the stomach. Other internal autopsy findings were corrosion of mucosa of esophagus, stomach and small intestine, softening of mucosa of the esophagus and stomach, ulceration of mucosa of esophagus and small intestine and perforation of esophagus, stomach and small intestine.
3. Congestion of organs was common internal autopsy finding in poisoning cases.
4. Cerebral and pulmonary edema were the common internal autopsy finding in poisoning cases.
5. Stomach contents revealed kerosene like odor in maximum number of cases followed by garlicky odor and acetone like odor.

References: