An unusual case of death in police custody: suicide by consumption of potassium cyanide

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ABSTRACT
BACKGROUND: Deaths in police custody/prison are not uncommon. Whenever such deaths occur there is allegation of custodial torture by the relatives of the dead, media and political parties in opposition. Forensic pathologist plays vital role in delivery of justice in such cases by doing meticulous postmortem examination in compliance to the guidelines of National Human Rights Commission and the state. Deaths due to potassium cyanide poisoning are very sudden and the fatal period is zero to thirty minutes. So, when death occurs in police custody due to consumption of potassium cyanide poisoning, allegations of custodial torture/custodial negligence are leveled against authorities. We are presenting an unusual case in which a person who was arrested by the police, died suddenly due to consumption of potassium cyanide.

Keywords: custody deaths, custodial torture, forensic pathologist, postmortem examination, potassium cyanide poisoning, chemical analysis

INTRODUCTION
Preventing torture in custody and ensuring strict compliance of its guidelines in custodial deaths is one of the important agenda of NHRC. Deaths in police custody/prison are not uncommon. Whenever such deaths occur there is allegation of custodial torture by the relatives of the dead, media and political parties in opposition. Forensic pathologist plays vital role in delivery of justice in such cases by doing meticulous postmortem examination in compliance to the guidelines of National Human Rights Commission and the state. People in custody are more likely to die prematurely, especially from violent causes, than similar people not in custody. Therefore it is not only the lawful duty but also moral responsibility, of police to keep a person in there custody with necessary care and concern for his safety.¹

Acute cyanide poisoning in human is rare and is predominantly caused by smoke inhalation from fires and much more rarely by intentional ingestion of cyanide salts as in suicide or homicide attempts². Apart from potassium and sodium cyanide salts, numerous cyanide compounds exist, including gaseous hydrogen cyanide (HCN), and water soluble mercury, copper, gold and silver cyanide salts. Because of the early onset of severe symptoms and difficulty in diagnosis, cyanide poisoning is frequently lethal. It is a rare experience for clinicians to encounter, but continues to be used in suicides and homicides³,⁴,⁵. Its lethality is related to rapid onset of toxicity, nonspecific nature of symptoms and failure to consider the diagnosis. Acute cyanide toxicity can take place through ingestion, inhalation and absorption through mucous membrane. Since there are no pathognomic symptoms for its toxicity, it is pertinent to acquire a full history and consider the diagnosis in case of unexplained sudden collapse³.

This study presents a unique case of suicidal poisoning by consumption of potassium cyanide by a person, jeweler by profession, who was arrested by the police on suspicion of cheating the public regarding gold articles. The report is expected to alert the public, police and

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Case report

A 25 year male person, jeweler by profession, had experienced epileptic convulsions while in police lockup. White colour froth was oozing from mouth, patient became dyspnoic and comatose and was immediately taken to the nearby hospital. There was no specific history about consumption/inhalation of any poison. At hospital injection adrenalin was given and external cardiac massage and resuscitation was done. He died within 10 minutes of hospitalization.

Following his death, allegations of custodial torture were raised by the relatives. So after executive magistrate submitted inquest papers, medico-legal postmortem was performed at government medical college and hospital by a panel of four doctors from department of forensic medicine & toxicology and pathology.

On examination of clothes reddish stains were present on shirt at places and all clothes were intact. The deceased was moderately built and rigor mortis was present all over body. Postmortem lividity was present over back and buttocks and was brick red in colour. Signs of decomposition were absent. Eyes were closed and pupils were dilated and fixed. Fingers of both hands and both palms showed blackish discolouration. Yellowish fluid was oozing from nostrils, lips were cyanosed. There were no external injuries present over the body. There was no perception of peculiar smell of any poison.

On internal postmortem examination, brain (1100gm) was congested and edematous. The lungs (right- 400gm, left- 300gm) were congested, edematous and on cut section congestion and hemorrhages were present. Trachea, laryngeal cartilages and hyoid bone were intact. Heart (250 gm) was normal in size and shape with all valves, chambers and coronaries normal. No free fluid was noted in pleural and pericardial cavities. Liver (1400gm), spleen (100gm), both kidneys (100 gm each) were congested. Stomach contained 10ml yellowish fluid having no peculiar smell and mucosa of stomach was congested and petechial hemorrhagic spots were present. The mucous membrane of stomach and duodenum was inflamed and softened.

All internal organs were intact. Organs were preserved for histopathological examination and chemical analysis. In addition to this, scalp hair and finger nails were preserved for chemical analysis for detection of heavy metallic poisons, if any.

Table: 1 Chemical analysis report revealed potassium cyanide in the exhibits as follows

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Quantity of potassium cyanide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stomach and loop of small intestine with their contents</td>
<td>6.50 milligrams per 100 grams</td>
</tr>
<tr>
<td>Liver along with gall bladder, spleen and kidneys</td>
<td>2.60 milligrams per 100 grams</td>
</tr>
<tr>
<td>Blood</td>
<td>0.91 milligrams per 100 milliliters</td>
</tr>
</tbody>
</table>

Chemical analysis report of scalp hair and nails did not reveal any heavy metallic poison including arsenic.

Histopathological examination report revealed pulmonary edema, pulmonary hemorrhages and marked pulmonary vessels congestion. Liver and spleen were congested. Heart showed normal myocardial fibers. Kidneys showed glomerular congestion and renal tubules showed cloudy change. Brain showed meningeal edema and congestion and cerebral edema.

On receipt of our postmortem report and instructions given by us to the police, they sent the following samples, recovered from the deceased when he was alive to the regional forensic Table: 2 science laboratory for detection of poison.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Result of chemical analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenish liquid in plastic can</td>
<td>Mixture of concentrated sulphuric acid and concentrated nitric acid (it detected 18% w/v of silver)</td>
</tr>
<tr>
<td>Yellowish powder in polythene bag</td>
<td>Soap/detergent powder containing iron and silicate ions</td>
</tr>
<tr>
<td>Brownish powder in polythene bag</td>
<td>Ammonium, iron, chloride, sulphate and silicate ions</td>
</tr>
</tbody>
</table>

Fig.1- slide photo showing pulmonary oedema
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Fig.2- slide photo showing glomerular congestion

So, based upon clinical presentation of the patient, postmortem findings, chemical analysis report and histopathological findings we gave our final opinion as to the cause of death as “potassium cyanide poisoning”.

DISCUSSION

Potassium cyanide poisoning is difficult to diagnose unless there is specific clinical history. Unfortunately recognition of cyanide poisoning may be delayed because the majority of clinical and laboratory findings are nonspecific.6,7 Hydrocyanic acid and various cyanides are often used for suicidal purposes, as their swift and sure action is generally known8. The postmortem lividity in potassium cyanide poisoning is bright red or pink due to formation of cyanmethaemoglobin and also to the fact that the tissues cannot take up the oxygen of the blood. Thus asphyxial death occurs in presence of oxygen8. In our study we noted brick red colour of postmortem lividity. This finding is consistent with the case report of Nnoil MA et al.3 We did not notice any smell of bitter almonds during postmortem examination. The bitter almond smell of hydrocyanic acid can be detected by 60% of population. The threshold for those persons who can sense the odour is estimated to be 1 to 5 ppm concentration in air9. Hydrocyanic acid forms cyanides with metals. Of these potassium cyanide is used in photography, electroplating, silver and gold processing. The deceased was jeweler by profession. The chemical analysis report of the samples which were sent by the police from the scene of crime revealed mixture of concentrated sulphuric acid and concentrated nitric acid (it detected 18% w/v of silver). Commercial sulphuric acid is usually brown or dark in colour and often contains impurities such as lead sulphate, arsenic and nitric acid. Nitric acid is a powerful oxidizing agent and dissolves all the metals except gold and platinum. Therefore nitric acid is commonly used by the goldsmiths. That’s why nitric acid and silver were also detected on chemical analysis. The sample sent by the police from scene of crime didn’t contained potassium cyanide, because the deceased may have only a small quantity of potassium cyanide which he had totally consumed.

The symptoms experienced by our patient prior to death were similar to those reported in Nnoil MA3 study which revealed unconsciousness, dyspnoea and cyanosis with a noncardiogenic pulmonary edema. White froth about the lips and convulsions experienced by the deceased prior to death has also been mentioned by in textbook8. The sudden collapse and cellular hypoxia results from inhibition of cytochrome oxidase and accounts for sudden deaths. Pulmonary edema, pulmonary hemorrhages and marked pulmonary vessels congestion were seen in our study. An extreme congestion in all the organs suggestive of death due to inhibition of mitochondrial cytochrome oxidase leading to deprivation of oxygen consumption at cellular level, due to potassium cyanide poisoning. Our external and internal postmortem findings are consistent with Pradhan M et al10 and Nnoil MA et al.3 Bardale R et al11 and Bansal YS et al12 have reported 2 cases each of death in police custody/prison, died due to (unspecific) poisoning. Bardale R et al13 reported 5 cases of death in police custody/prison died due to insecticidal poisoning. Agnihotri AK et al14 have reported 2 cases of death in police custody/prison, died due to alcohol/drugs poisoning. Pradhan M et al10 described accidental cyanide poisoning from inhalation of gold polishing chemical by a jeweler, who at the time of accidental inhalation was working in a jewellary shop.

We reviewed the literature and noticed that none of the death was documented about death following potassium cyanide...
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consumption in custody. Hence, this case report becomes unique.

CONCLUSION
The death from potassium cyanide poisoning occurs within 30 minutes of consumption and hence specific and timely treatment should be provided to the patient. The incidence of poisoning by potassium cyanide is very common among persons who are in contact working in photography, electroplating, silver and gold processing occupations. The forensic pathologist should give due attention to the background and occupation of the deceased while conducting postmortems in cases of sudden and unexpected deaths. This report is also aimed at alerting the treating doctors and the persons in charge of the arrested persons about proper treatment and care.

REFERENCES