

Study of Modes of Identification, Cause of Death and Time since Death in Cases of Decomposed Bodies: A Prospective Study

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Abstract

The owing to the decomposition of dead bodies, the identification, cause of death and time since death of a dead body becomes very difficult or may even impossible.[1-3] So in order to outcome this problem, present study was conducted in the Department of Forensic Medicine at P.D.U. Medical College, RAJKOT (Gujarat) from 1st September 2009 to 15th May 2011 on dead bodies brought to the mortuary of this institution. During that period out of total 4034 dead bodies, 100 dead bodies showing the signs of decomposition were received for the present study which accounts 2.47% deaths. Identity was established in 71% cases while 29% cases remained unidentified. In majority of cases (68%) cause of death was unnatural while in 6% cases cause of death was natural. No cause of death could be detected in 26% cases. In 52% cases, *time since death* was 1-3 days followed by 29% cases in which time since death was 3-7 days.

Keywords: Decomposition; Identification; Cause of death; Time since death.

Introduction

Owing to the rapid decomposition of dead bodies in warm climates as in India or because of damage by wild animals the identification of a dead body becomes very difficult or may even impossible. If the body is not identified, the investigations in all medico-legal cases come to a standstill from the beginning, as establishment of identity is the first step in investigations. Due to the same reason the chances of getting positive findings to derive cause of death are progressively reduced as

the state of decomposition advances. As the decomposition progresses, the chances of getting reasonably accurate time since death are less. Determination of reasonably accurate time since death has a bearing on the issue of alibi and opportunity in criminal cases. In civil cases also, time since death may have implications. In all above circumstances autopsy surgeon has to play an important role by providing data related to identification, cause of death and time since death which provides important clues to the investigators to solve out the cases.[4-7]

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Material and Method

Present study was conducted in the Department of Forensic Medicine at P. D. U. Medical College, RAJKOT (Gujarat) from 1st September 2009 to 15th May 2011. During this period out of total 4034 dead bodies, 100 dead bodies showing the signs of decomposition were received. These dead bodies were selected for the study irrespective of identified or unknown, age group, gender, religion, marital status and place from where the body was received.

Table 1: Distribution Of Cases Into Decomposed Bodies And Skeletal Remains

	No. Of Cases (%)
Decomposed Bodies	93 (93%)
Skeletal Remains	7 (7%)
Total	100 (100%)

After receiving dead body in mortuary, a detailed history about person last seen alive, the place where body found, and the environment of that place were recorded in the specially designed Proforma. Thorough examination of dead bodies was done to study the changes of decomposition, data for identification, findings suggestive of cause of death and time since death. The data so collected are compiled on the specially designed proforma, tabulated in master-chart, and subjected to computer assisted analysis and conclusions were drawn.

Observations

Out of total 100 cases, 93% cases were in

various stage of decomposition and 7% cases were reduced to skeleton

According to Table 2, it was found that 55% corpses were identified while 45% corpses were unidentified. Out of 93 cases of decomposed bodies, 50 (53.76%) cases were identified while among 7 cases of skeletonised remains, 5 (71.42%) cases were identified.

Table 3 shows that out of 45 unidentified cases, on follow up, the 35.55% cases were identified and 64.45% cases were remains unidentified.

Table 4 indicates that in 55 cases identity was established by investigating authority before autopsy. Identity was established in 16 cases after autopsy. Out of these 16 cases, clothes and ornaments formed the main basis for identification in 56.25% cases followed by DNA profile (37.50%) and personal belongings (6.25%).

Table 5 shows that in maximum number of cases (68%) cause of death was unnatural; out of them; cause of death was drowning in 40%

Table 2: Distribution Of Cases According To Whether Corpse Was Identified Or Not

	Identified	Unidentified	Total (%)
Decomposed Bodies	50 (50%)	43 (43%)	93 (93%)
Skeletal Remains	5 (5%)	2(2%)	7 (7%)
Total	55 (55%)	45 (45%)	100 (100%)

Table 3: Distribution Of Unidentified Cases According To Their Identification Status On Follow Up (45 Cases)

	Identified	Remain Unidentified	Total (%)
Decomposed Bodies	15(33.33%)	28(62.22%)	43(95.55%)
Skeletal Remains	1(2.22%)	1(2.22%)	2(4.44%)
Total	16(35.55%)	29(64.45%)	45(100%)

Table 4: Distribution Of Cases According To Various Modes By Which Identification Of Corpse Was Done (In 71 Cases)

No. Of Identified Dead Bodies	Data For Identification				Total (%)
	Clothes & Ornaments	Personal Belongings	DNA Profile	Tattoo Mark	
Identified Before Autopsy (55 Cases)	36 (65.45%)	16 (29.09%)	-	3 (5.46%)	55 (100%)
Identified After Autopsy (16 Cases)	9 (56.25%)	1 (6.25%)	6 (37.50%)	-	16 (100%)

Table 5: Distribution Of Cases According To Cause Of Death

Cause Of Death		Decomposed Bodies	Skeletal Remains	Total (%)	
Unnatural Death	Drowning	38 (38%)	2 (2%)	68 (68%)	
	Mechanical Injuries	Head Injuries	8 (8%)		-
		Firearm Injuries	5 (5%)		-
		Others	2 (2%)		-
	Poisoning	10 (10%)	-		
	Strangulation	1 (1%)	-		
	Electrocution	1 (1%)	-		
Hanging	1 (1%)	-			
Natural Death	Coronary Insufficiency	5 (5%)	-	6 (6%)	
	Lung Pathology	1(1%)	-		
No Opinion		21 (21%)	5 (5%)	26 (26%)	
Total		93 (93%)	7 (7%)	100(100%)	

Table 6: Distribution Of Cases According To Time Since Death

Time Since Death	Decomposed Bodies	Skeletal Remains	Total (%)
1-3 Days	52 (52%)	-	52 (52%)
3-7 Days	29 (29%)	-	29 (29%)
1-3 Weeks	06 (6%)	1 (1%)	7 (7%)
3weeks-3months	06 (6%)	3 (3%)	9 (9%)
3-6 Months	-	3 (3%)	3 (3%)
Total	93 (93%)	7 (7%)	100 (100%)

cases followed by mechanical injuries (15%), poisoning (10%), hanging (1%) strangulation (1%) and electrocution (1%). 6% cases were of natural death which include coronary insufficiency (5%) and 1% case death was due to lung pathology. Here in 26% cases, cause of death could be detected.

Table 6 shows that 81% cases in which time since death was less than 7 days. Whereas 7% cases were in stages of advanced decomposition in which time since death was within 1 to 3 weeks. In majority of cases (6%) of skeletal remains, time since death was within 3 weeks to 6 months duration and in only one case, the body was reduced to skeleton in 5 to 15 days of death.

Discussion

Identification is of prime importance in decomposed bodies as features become bloated as decomposition progressed.[1,2,8] In present study it was found that 71% cases were identified while 29% cases were unidentified. Most of the corpses were identified by deceased's family member, relatives and

friends.

Among 55 cases which were identified before autopsy, majority of cases (65.45%) were identified by clothes and ornaments followed by 29.09% personal belongings e.g. pocket contents, wrist watch, mobile phone etc. and 5.46% by tattoo marks.

Among 16 cases which were identified after autopsy, majority of cases (56.25%) were identified by clothes and ornaments followed by 37.50% DNA Fingerprinting and 6.25% by personal belongings e.g. pocket contents, wrist watch, mobile phone etc.

It is stated by Berry A J Fisher and others that fingerprinting is very useful technique for identification, which is unfailling in practice. Because of non-availability of previous records for cross matching, this technique is not of much use in India. In none of the case of present study, identity was established by fingerprinting.[9]

In present study of 100 cases, where the majority cases did not show any ante-mortem injuries over the body and none of them were positive for poisoning as confirmed by chemical analysis at Forensic Science

Laboratory. In all these cases sternum bone was preserved for diatoms test. Diatoms were detected in 40% cases in both bone marrow and sample of water from alleged place of drowning, which also showed similarity in their concentration and morphology, thus confirming death due to drowning. These findings were consistent with that of all other authors. It shows that in drowning cases diatoms test provides concrete evidence.

In 15% cases, cause of death was mechanical injuries where fatal injuries over the body were identifiable despite of changes of decomposition. Out of these 15% cases of injuries, 8% cases were of head injury, followed by 5% cases of firearm and in rest 2% cases other injuries i.e. lacerations, contusions etc. were present. Out of 5% cases of firearm injury, 3% cases were of rifled firearm and 2% cases were of shot gun firearm.

In 10% cases of poisoning, organo-phosphorus was detected in 6% cases while aluminum phosphide was detected in 4% cases.

In 5% cases death was due to coronary insufficiency which was confirmed by histopathological examination of heart. In 2% cases the ligature mark of hanging and strangulation was visible over the neck and could be examined distinctly from the changes of decomposition.

Our observation are very well supported by Modi and KrishanVij who have said that external fatal injuries are not difficult to find even in decomposed bodies whereas in cases of hanging and strangulation, the ligature mark would be apparent, even if the epidermis has peeled off.[3,4]

In one case, the death was due to electrocution and in remaining one case is of natural death in which we got the findings of lung pathology.

26% cases of present study were of negative autopsy in which gross and microscopic examination, toxicological analyses and laboratory investigation fail to reveal cause of death.

In present study, maximum numbers of

cases (52%) were brought within 1-3 days after death followed by 29% cases in 3-7 days. This finding was consistent with the study of Shah et al in which 74% cases were brought within 7 days after death.

The reason behind this could be explained as during early phase of decomposition body emit foul smell as well attacked by animals and by this way it goes noticed by many people. While in cases of drowned bodies, it takes about 1-3 days to float when the sufficient gases of decomposition have developed to make it lighter and to get noticed by people.

Conclusion

Identity was established in 71% cases while 29% cases remained unidentified. Out of 71% cases, 55% cases were identified before autopsy and 16% were identified after autopsy.

Among 55% cases which were identified before autopsy, majority of cases (65.45%) were identified by *clothes and ornaments* followed by 29.09% *personal belongings* e.g pocket contents, wrist watch, mobile phone etc. and 5.46% by *tattoo marks*.

Among 16% cases which were identified after autopsy, majority of cases (56.25%) were identified by *clothes and ornaments* followed by 37.50% *DNA Fingerprinting* and 6.25% by *personal belongings* e.g pocket contents, wrist watch, mobile phone etc.

Among all cases of decomposed dead bodies, in majority of cases (68%) cause of death was unnatural while in 6% cases cause of death was natural. No cause of death could be detected in 26% cases.

Among unnatural deaths, in majority of cases (40%) cause of death was drowning followed by mechanical injuries (15%), poisoning (10%), hanging (1%), strangulation (1%) and electrocution (1%). Among 6% cases of natural death, cause of death was coronary insufficiency in 5% cases and lung pathology

was in 1% cases.

In 52% cases, *time since death* was 1-3 days followed by 29% cases in which time since death was 3-7 days, in 7% cases it was 1-3 weeks, in 9% cases it was 3 weeks-3 months and in 3% cases it was 3-6 months.

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