

Profile of Cases of Decomposition and Correlation of Identification and Cause of Death With Time Since Death in Decomposition.

¹Shailesh D. Bhuva, ²Viral J. Aghera, ³H. M. Mangal, ⁴Pratik R. Varu, ⁵Milind N. Patel, ⁶Raghurajsinh D. Vaghela

¹Assistant Professor ^{2,4}Tutor, ³Professor & Head, ^{5,6}Resident doctor

Department of Forensic Medicine, P. D. U. Govt. Medical College, Rajkot, Gujarat

ABSTRACT:

Background: Decomposition is a major cause of Un-identification of a dead body and often it is very difficult to get the positive findings to derive the cause of death. **Aims & Objectives:** This study was conducted to know the incidence of decomposition in relation with age, sex, religion, marital status, and place of death etc, and to establish co-relation of identification and cause of death with time since death. **Results:** This study was conducted at the department of Forensic Medicine at P. D. U. Medical College, RAJKOT (Gujarat) and we found that highest numbers of the cases were Hindu, married Males in the age group of 21-30 years belonging to rural area. Among all cases, highest numbers of cases were received during the months from July to October. **Conclusion:** Among all cases of decomposed dead bodies, identity was established in 71% and cause of death was established in 74%. Identity was established in 75% cases when time since death was within 1-3 days. Cause of death was established in 84.61% cases when time since death was within 1-3 days, while could not be detected in all cases when time since death was more than 3 months duration. So it is evident that as the time since death increases, possibility of determination of identity and cause of death decreases.

Key-words: Decomposition, Time since death, Cause of death, identification, Correlation.

Corresponding Author: Dr. Shailesh D. Bhuva (M.D.), Assistant Professor, Department of Forensic Medicine, P. D. U. Govt. Medical College, Rajkot (Gujarat)-360001.

INTRODUCTION:

As the decomposition progress, the identification of a dead body becomes very difficult or may even impossible and the chances of getting positive findings to derive cause of death are progressively reduced.^{1,2,3}

So present study was conducted to establish co-relation of time since death with identification and cause of death and also to know the incidence of decomposition in relation with age, sex, religion, marital status, and place of death etc. Decomposition is the nature's mode for disposal of dead bodies. It is the final stage following death where dissolution of a dead body take place resulting in breaking down of complex organic constituents of body into simpler inorganic substances. From 18-36 hours after death, the gases collect in the

tissue, cavities and hollow viscera under considerable pressure, which begins to distend the body and the features become bloated and distorted.^{4,5,6,7}

MATERIAL & METHODS:

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 P. D. U. Medical College and Hospital, RAJKOT. 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 and marital status. 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.

Autopsies were conducted by routine autopsy-procedures and with routine autopsy instruments. 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 and conclusions were drawn.

RESULTS:

TABLE-1: AGE WISE DISTRIBUTION OF CASES

AGE GROUP	DECOMPOSED BODIES	SKELETAL REMAINS	TOTAL (%)
Newborn to 10 yr	4(4%)	-	4(4%)
11-20 year	14(14%)	1(1%)	15(15%)
21-30 year	30(30%)	3(3%)	33 (33%)
31-40 year	23(23%)	2(2%)	25 (25%)
41-50 year	12(12%)	1(1%)	13(13%)
51-60 year	7(7%)	-	7(7%)
61-70 year	1(1%)	-	1(1%)
>70 year	2(2%)	-	2(2%)
Total	93 (93%)	7 (7%)	100 (100%)

Table-1 indicates the age wise distribution of the total cases studied. It includes case distribution under eight groups from newborn to 70 years and more. As the above table suggests, the age groups between 21-40 years covers the maximum number of cases (**58%**) of decomposed bodies while least number of cases (3%) were found in the age group more than 60 years.

TABLE-2: GENDER WISE DISTRIBUTION OF CASES

	MALE	FEMALE	TOTAL (%)
Decomposed bodies	82(82%)	11(11%)	93(93%)
Skeletal remains	6 (6%)	1(1%)	7(7%)
Total	88(88%)	12 (12%)	100 (100%)

In all cases of study, gender was identified after autopsy and follow up examination. **88%** cases were male and 12% cases were female, in a ratio of 7.33:1, showing a male predominance.

TABLE-3: DISTRIBUTION OF CASES ACCORDING TO HABITATE FROM WHERE CORPSE WAS FOUND

	RURAL	URBAN	TOTAL (%)
Decomposed bodies	51 (51%)	42(42%)	93(93%)
Skeletal remains	6 (6%)	1(1%)	7(7%)
Total	57 (57%)	43(43%)	100(100%)

Table-3 indicates the demographic distribution of cases under rural and urban heads. It is seen that **57%** corpses were recovered from rural areas which is slightly higher than corpses that were recovered from urban areas which is 43%.

TABLE-4: MONTH WISE DISTRIBUTION OF CASES

YEAR	2009			2010			2011		
MONTH	DECOMP. BODIES	SKELETAL REMAINS	TOTAL	DECOMP. BODIES	SKELETAL REMAINS	TOTAL	DECOMP. BODIES	SKELETAL REMAINS	TOTAL
Jan.	-	-	-	1	-	1	4	-	4
Feb.	-	-	-	3	-	3	4	-	4
Mar.	-	-	-	3	-	3	6	-	6
Apr.	-	-	-	5	-	5	3	-	3
May	-	-	-	9	-	9	3	1	4
June	-	-	-	3	1	4	(Till 15 th May)		
July	-	-	-	7	-	7	-	-	-
Aug.	-	-	-	8	2	10	-	-	-
Sep.	10	-	10	4	2	6	-	-	-
Oct.	5	-	5	4	-	4	-	-	-
Nov.	5	1	6	2	-	2	-	-	-
Dec.	1	-	1	3	-	3	-	-	-
TOTAL	21	1	22	52	5	57	20	1	21

DECOMP- DECOMPOSED

During 2010, study shows that maximum number of cases 27 (**47.36%**) cases received during the months from July to October followed by 21 (**36.84%**) cases in the months from March to June and during November to February only 9 (15.78%) cases were recovered. Yearly comparison for specific month during study period did not show any specific co-relation.

TABLE-5: DISTRIBUTION OF CASES ACCORDING TO RELIGION (IN IDENTIFIED 71 CASES)

	HINDU	MUSLIM	CHRISTIAN	TOTAL (%)
Decomposed bodies	64 (90.14%)	1(1.41%)	1(1.41%)	66 (92.96%)
Skeletal remains	5(7.04%)	-	-	5 (7.04%)
Total	69 (97.18%)	1(1.41%)	1(1.41%)	71(100%)

It can be noticed from Table-5 that the majority of cases (**97.18%**) belongs to Hindus followed by only 1 (1.41%) case from Muslims and 1 (1.41%) from Christian community.

TABLE-6: CORRELATION OF IDENTIFICATION WITH TIME SINCE DEATH

TIME SINCE DEATH	NO. OF CASES IDENTIFIED	NO. OF CASES UNIDENTIFIED	TOTAL NO. OF CASES (%)
1-3 days	39 (75%)	13 (25%)	52 (100%)
3-7 days	21 (72.41%)	08 (27.59%)	29 (100%)
1-3 weeks	5 (71.42%)	2 (28.58%)	7 (100%)
3weeks-3months	5 (55.56%)	4 (44.44%)	9 (100%)
3-6 months	1 (33.33%)	2 (66.67%)	3 (100%)

Table- 6 shows that **75%**cases were identified during the period of 1-3 days of time since death followed by 72.41% cases in 3 to 7 days followed by 71.42% cases in 1 to 3 weeks followed by 55.56% cases in 3 weeks to 3 months and 33.33% in more than 3 months duration.

TABLE-7: CORRELATION OF CAUSE OF DEATH WITH TIME SINCE DEATH

TIME SINCE DEATH	CAUSE OF DEATH DETERMINED	No opinion	TOTAL NO. OF CASES (%)
1-3 days	44 (84.61%)	8 (15.39%)	52 (100%)
3-7 days	21 (72.41%)	8 (27.59%)	29 (100%)
1-3week	4 (57.14%)	3 (42.86%)	7 (100%)
3weeks-3months	3 (33.33%)	6 (66.67%)	9 (100%)
>3months	-	3 (100%)	3 (100%)

Table-7 shows that cause of death was determined in 84.61% cases that were brought within 1 to 3 days of time since death followed by in 72.41% cases of 3 to 7 days duration, 57.14% cases of 1 to 3 week duration and in 33.33% cases of 3 weeks to 3 months duration. Opinion regarding cause of death was not given in all cases of more than 3 months duration.

It can be seen from the Table-7 that **59%** cases were included under category A and 22% cases were included under category B. In 12% cases, the internal organs were liquefied into a single mass and they were included under category C. The 7% cases of skeletal remains were included under category D where the organs were absent.

DISCUSSION:

The present study was undertaken to study and analyze 100 cases of decomposed bodies including skeletal remains whose medico legal autopsies were conducted at mortuary of this institute, during period of 1st September, 2009 to 15th May, 2011. Total 4034 autopsies were conducted during this period. So incidence of decomposed bodies was 2.47%.

In present study, as shown in Table no.1, the age group of **21-30 years** covers the highest number of cases (**33%**) of decomposed bodies while least number of cases (1%) were found in the age group more of 61-70 years. The higher incidences among these ages could be due to higher mobility and have to go far away from home for work as earning person of families are of these age group. They are more affected by social, economical and

cultural trends of society than others.

As per Table no.2, majority (**88%**) of the victims were male and only 12% were female. Male predominance is due to the fact that, by social and cultural rituals, they are more active in our country. As per Table no.3, **57%** of the cases were recovered from the rural areas, while **43%** from urban areas. Reason for the more number of cases in rural areas may be that in rural areas there is less population, more field areas and more remote areas so the corpse may go unnoticed for a longer period.

As Table no.4 shows that highest numbers of cases (**47.36%**) were received during the months from July to October which are the months of *monsoon* followed by **36.84%** cases in the months from March to June which are the months of *summer* and only **15.78%** cases were found during November to February which are the months of *winter*. The reason behind that may be explained by almost all authors that changes of decomposition are very fast in hot and humid atmosphere as compared to cold climate. So decomposition of body is more common in the months of monsoon and summer.

As per Table no.5, the majority of the cases were of *Hindus* comprising **97.18%** of the identified cases, followed by *Muslim* and *Christian* comprising 1.41% each. This finding was comparable with the study by Shah et al⁴⁶, where 91.38% cases were from Hindu religion followed by 6.89% Muslim and 1.73% Christian. The higher percentage of cases of *Hindus* is explained by their higher population in our country.

C O R R E L A T I O N O F IDENTIFICATION AND CAUSE OF DEATH WITH TIME SINCE DEATH

In present study highest number of cases (**75%**) were identified during the period of 1-3 days of time since death followed by 72.41% cases in 3 to 7 days followed by 71.42% cases in 1 to 3 weeks followed by 55.56% cases in 3 weeks to 3 months and 33.33% in more than 3 months duration. In higher number of cases (**84.61%**), cause of death was established within 1-3 days of death. Opinion regarding cause of death was not given in **66.67%** cases of 3 weeks to 3 months duration and in **100%** cases of more than 3 months duration. So the possibility of identification as well the chances of getting positive findings and hence determination of cause of death is decreased as the decomposition progress.^{8,9}

Various possible reasons could be explained as with advancement of decomposition, the body becomes swollen and appears stouter which changes its normal physique. Features become bloated and distorted to such an extent that even near relatives are not able to identify the deceased. Scalp hairs also get removed sometimes which makes identification almost impossible. Because of damage by animals the identification of a dead body becomes very difficult or may even impossible in case of skeletal remains.¹⁻⁹

CONCLUSION:

- Study of 100 cases of decompose dead bodies was conducted in Forensic Medicine Department. Cases were selected from total 4034 autopsies conducted at P. D. U. Medical College & Hospital, Rajkot during the period of 1st September, 2009 to 15th May, 2011.
- Among all cases of decomposed dead bodies, identity was established in **71%** cases while **29%** cases remained unidentified and cause of death was established in **74%** cases and opinion regarding cause of death could not be given in **26%** cases.
- Identity was established in **75%** cases when time since death was within 1-3

days followed by **72.41%** cases in 3 to 7 days, 71.42% cases in 1 to 3 weeks, 55.56% cases in 3 weeks to 3 months and 33.33% cases in 3-6 months.

- Cause of death was established in **84.61%** cases when time since death was within 1-3 days, followed by in **72.41%** cases in 3 to 7 days, 57.14% cases in 1 to 3 week and 33.33% cases in 3 weeks to 3 months. Cause of death could not be detected in all cases when time since death was more than 3 months duration. So it is evident that as the time since death increases, possibility of determination of identity and cause of death decreases.
- Highest numbers of cases (33%) were present in the age group of **21-30** years, followed by 25% cases in age group of 31-40 years. Majority (**88%**) of cases were male and only 12% were female.
- Majority of cases were recovered from rural areas (**57%**) as compared to urban area (**43%**).
- Among all cases of decomposed bodies, highest numbers of cases (**47.36%**) were received during the months from July to October followed by **36.84%** cases in the months from March to June and only **15.78%** cases were found during November to February. So it is evident that incidence of decomposition is higher in months of summer and monsoon as compare to winter months.
- Among identified bodies, majority of cases (**97.18%**) were of Hindu community followed by 1.41% from Muslim and Christian community each.
- Among identified bodies, majority of cases (**64.78%**) were married as compared to unmarried cases (33.79%).

Conflict of Interest: None

Source of Funding: Nil

References:

1. Reddy KSN. The Essentials of Forensic Medicine and Toxicology: 28th Ed. Hyderabad, K. Suguna Devi: 2009;148-60.
2. Nandy A. Principles of forensic Medicine: 3rd Ed. Hyderabad, New Central Book Agency Ltd., 2010;262-82.
3. Mathiharan K, Patnaik AK. Modi's Medical Jurisprudence and Toxicology; 23rd Ed. New Delhi, Lexis Nexis Butterworth, India, 2009;435-50.
4. Vij K. Textbook of Forensic Medicine and Toxicology-Principles and Practice; 4th Ed. New Delhi, Elsevier, India, 2008;132-46.
5. Parikh CK. Parikh's Text Book of Medical Jurisprudence and Toxicology; 5th Ed, 1995; 155-71.
6. Spitz and Fisher. Medico legal investigation of death, 3rd Ed. 1993;31-70.
7. Taylor. Principles and Practice of Medical Jurisprudence, 13th Edition, Churching Livingstone, New Delhi 2001;145-55.
8. Pillay VV. Handbook of Forensic Medicine and Toxicology, 14th Edition, 2014;104-07.
9. Dimaio VJ, Dimaio D. Forensic Pathology, 2nd Ed. Florida, CRC Press LLC, 2001;30-40.
10. Knight B. Forensic Pathology, 3rd Edition, Edward Arnold (Publishers) Ltd, London. 2004;63-78.

Cite this Article as: Bhuva SD, Aghera VJ, Mangal HM, Varu PR, Patel MN, Vaghela RD. Profile of Cases of Decomposition and Correlation of Identification and Cause of Death With Time Since Death in Decomposition. Int Res Pub Med Sci 2015; 1(3):46-51.