

An Autopsy Based Retrospective Analytical Study about Demographic Profile of Decomposed Bodies at Raigarh (C.G.) Region

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Abstract

Introduction: Medico-legal autopsy of decomposed bodies are the most hectic task for an autopsy surgeon since he/she is liable to provide data for fixation of P.M.I, Type of injury, C.O.D, etc. These datas are crucial for the purpose of administration of justice. Once upon a time autopsy of decomposed bodies were known as most unrewarding one, but due to improvement in scientific techniques, such situation had been partially over come. An attempt has been made in survey form of cases autopsized in K.G.H. mortuary at Raigarh to examine the feasibility to overcome the effect of above obstacles in recent situation. **Aims & Objectives:** In order to assess whether it is easy to find out injuries, cause of death, pattern of changes after death etc. in decomposed bodies and to assess the extent of certainty, three years and seven months study had been conducted. Further it is also aimed at to study the age, sex and season wise incidents of cases, cause of death etc. **Materials & Methods:** 78 decomposed bodies were autopsized out of total 1763 autopsy cases during the period from Jan 2015 to July 2018 in KGH mortuary at Raigarh, Chhattisgarh. **Observations and results:** Main points of discussion confined to (i) Season, (ii) Identity, (iii) Age group, (iv) Sex, (v) C.O.D. Maximum cases (48.72%) were found in summer. In total autopsized cases male predominance (80.76%) was found with M:F= 4.2:1. Maximum number of deceased persons were found in adult age group (21-60) [71.79%] and maximum cases were found in advanced stage of decomposition (39.74%). The C.O.D was determined in 70.51% of cases.

Keywords: Decomposition; Autopsy; Mortuary; Identity; C.O.D.

Introduction

Decomposition is the process of conversion of complex organic tissues into simpler inorganic molecules [1]. It involves two processes putrefaction and autolysis [2]. Putrefaction is the process of gradual dissolution of the tissues into gases, liquids and salts. This process of transformation is caused mainly by proteolytic and other enzymes produced by certain group of pathogenic and non-

pathogenic strains of bacteria [3]. The physio-chemical changes occurring in the dead body can be demonstrated by 4 D's i.e. Discoloration, Distension, Degradation and Dissolution. Autolysis is the breakdown of cells and organs through an aseptic chemical process caused by intracellular enzymes. Earliest sign of decomposition in human body is greenish discoloration of Rt. Iliac fossa, while earliest internal change is discoloration of under surface of liver. *Cl. Welchii* is the main causative organism, due to excretion of lecithinase, a proteolytic enzyme causes decomposition. According to environmental conditions decomposition usually starts in corpse within 36-48 hrs.

It is impossible to deduce any general rule for the rate of putrefaction of a dead body because of the number and variability of the factors which influence its development. The factors modifying decomposition are (1) Presence or absence of clothing, (2) Whether the body was floating or

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buried, (3) Env. Temperature, (4) Injury, (5) Preexisting disease, (6) Poisoning etc. Important rule for rate of decomposition is "Casper Dictum" i.e. degradation of body tissues in different environmental conditions i.e. air, water and soil, usually remains in proportion of 1:2:8 [4]. During medico-legal autopsy of decomposed bodies, an autopsy surgeon is liable to fix (1) Identity of the deceased, (2) P.M.I, (3) Recording of injuries, (4) Cause of death, (5) Manner of death. For the purpose of fixing absolute identity long bone (preferably) is needed to be preserved along with clothing and available articles. For fixing P.M.I. assessment of decomposition changes over the body and if maggots are crawling over the body, then preservation of entomological evidences are quite helpful [5,6,7]. Assessment of injuries in a decomposed body is a difficult task except for fractures of bones. Some poisons accelerate the process of decomposition like Chronic Alcoholism, while some poisons delay the process of decomposition like Heavy metal poisoning. Some poisons resist this process like Organophosphates, while some poisons are also destroyed during this process (Morphine) [8]. Pre existing disease and morbid conditions may affect the process of decomposition in either direction.

To opine cause and manner of death is quite difficult. Modi's Medical Jurisprudence [9] has discussed the process to conduct the medico-legal autopsy of decomposed and mutilated bodies in details with reference of cases like Alavandar murder case, The drum murder case, The Ruxton case etc.

Review of Literatures

Study of Cyriac job (2009) [10], Study of Singh et al. (2015) [11], Lessig R et al. (2006) [12], Mukhopadhyay et al. (2014) [13], Ambade et al. (2011) [14], Galloway et al. (1989) [15] had discussed the issue relating to medico-legal autopsy & their findings in cases of decomposed bodies in details.

Materials & Methods

The present study was conducted at mortuary of LSLAMGMC & Associated K.G. Hospital, Raigarh. Total 78 cases of decomposed bodies which were brought during the study period for post mortem examination, were included in study. In the present study all cases were included irrespective of age, sex, caste, religion, dietary habits and socio-economic status.

Study Site

Mortuary of KGH and Dept. of F.M.T., LSLAMGMC Raigarh, (C.G.)

Study Duration

03 years and 07 months (Jan 2015 to July 2018)

Study Type

Cross sectional retrospective study

Inclusion and Exclusion Criteria

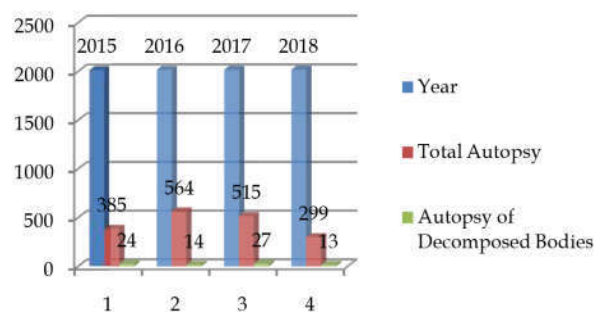
All cases of decomposed bodies were included for study except skeletonized bodies.

Observations & Results

Table 1: Total No. of Autopsy cases v. Autopsy of decomposed bodies

Year	Total Number of Autopsy cases	Total Number of Autopsy of decomposed bodies	%
2015	385	24	6.23
2016	564	14	2.48
2017	515	27	5.24
2018*	299	13	4.35
Total	1763	78	4.42

*Upto July 2018

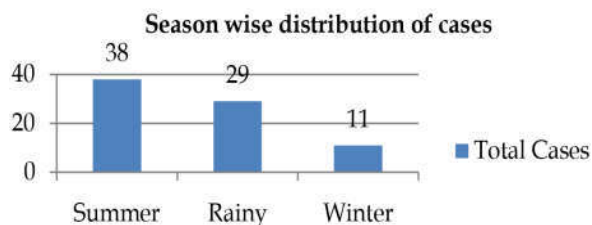


Graph 1: Month wise distribution of cases

Table 2: Month wise distribution of cases

Month	2015	2016	2017	2018	Total
Jan	-	-	-	-	0
Feb	-	-	-	4	4
March	2	2	1	3	8
April	1	2	4	-	7
May	3	2	4	2	11
June	4	1	6	1	12
July	8	-	2	3	13
Aug	1	2	3	*	6
Sept	1	1	1	*	3
Oct	-	3	4	*	7
Nov	2	-	2	*	4
Dec	2	1	-	*	3
Total	24	14	27	13	78

*Upto July 2018



Graph 2: Month wise distribution of cases

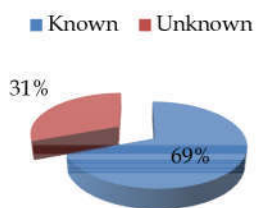
During summer (March-June) season total number of decomposed cases were 38, which is 48.72% of total cases, in rainy season (July-October) total case were 29, which is 37.18% of total cases and in winter (Nov-Feb.) only 11 cases were autopsized, i.e. 14.10% of total cases during Jan 2015- June 2018 (Table and Graph 2).

Table 3: Identity wise distribution

Identity	2015	2016	2017	2018	Total
Known	18	9	19	8	54
Unknown	6	5	8	5	24
Total	24	14	27	13	78

Total number of Known and Unknown decomposed bodies were 54 and 24 respectively i.e. 69.23% and 30.77% during Jan 2015- July 2018. (Table and Graph 3).

Identity wise distribution



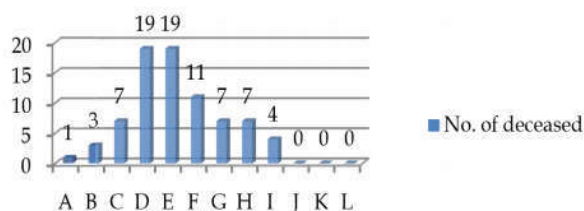
Graph 3:

Table 4: Age wise distribution of the dead bodies

Age	2015	2016	2017	2018	Total
Foetus (A)	-	1	-	-	1
0-10 (B)	1	-	1	1	3
11-20 (C)	3	1	3	-	7
21-30 (D)	3	4	7	5	19
31-40 (E)	3	5	5	6	19
41-50 (F)	4	1	5	1	11
51-60 (G)	4	1	2	-	7
61-70 (H)	5	-	2	-	7
71-80 (I)	1	1	2	-	4
81-90 (J)	-	-	-	-	-
91-100 (K)	-	-	-	-	-
101 & Above (L)	-	-	-	-	-
Total	24	14	27	13	78

According to age group maximum number of cases were found in age group of 21-30 (Total cases-19) and 31-40 years (Total cases- 19), below 20 years total no. of cases were 11 (14.10%), From 21-60 age group total cases were 56 (71.79%), Above 61 total cases were 11 (14.10%). No cases were found above age 80 years. (Table and Graph 4).

Age group wise distribution of cases



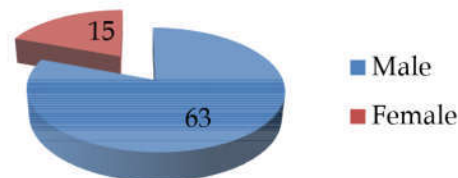
Graph 4:

Table 5: Sex wise distribution

Sl. No	Year	Male	Female	Total
1	2015	19	5	24
2	2016	12	2	14
3	2017	22	5	27
4	2018	10	3	13
Total		63	15	78

In sex wise distribution maximum case were found to be of male i.e. 63 (80.76%) and number of female case were 15 (19.23%). (Table and Graph 5).

Sex wise distribution of deceased

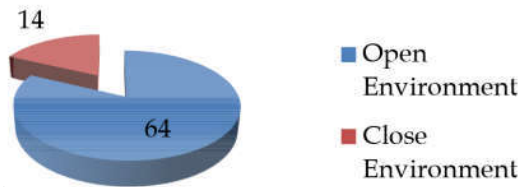


Graph 5:

Table 6: Distribution of cases according to place of recovery

Year	Place of Recovery		Total
	Open environment	Close environment	
2015	20	4	24
2016	13	1	14
2017	22	5	27
2018	9	4	13
Total	64	14	78

Distribution according to Place of Recovery



Graph 6:

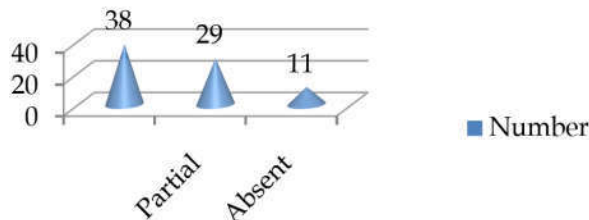
Total no. of cases recovered from open environment were 64 (82.05%) and from closed environment 14 (17.95%) cases were recovered. (Table and Graph 6).

Table 7: Distribution of cases according to clothing

Year	Clothing			Total
	Complete	Partial	Absent	
2015	15	5	4	24
2016	3	9	2	14
2017	15	10	2	27
2018	5	5	3	13
Total	38	29	11	78

Total cases found with complete clothing were 38 (48.72%), partially clothed were of 29 (37.18%) and clothing were absent in 11 (14.10%) cases. (Table and Graph 7).

Clothing of deceased

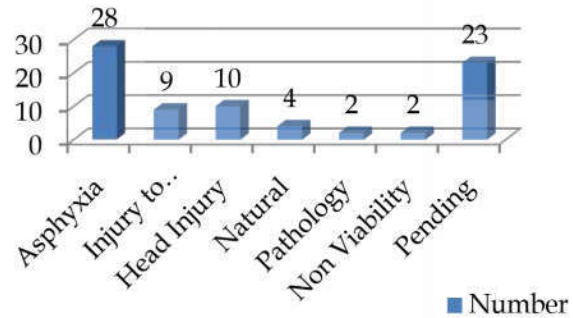


Graph 7:

Table 8: Distribution of cases according to stages of decomposition

Stages of decomposition	Year				Total	%
	2015	2016	2017	2018		
Initial Decomposition	9	2	9	3	23	29.48
Moderate Decomposition	5	7	9	3	24	30.77
Advanced Decomposition	8	3	5	5	21	39.74
Adipocere	-	1	1	2	4	
Mummified	2	1	3	-	6	
Total	24	14	27	13	78	

C.O.D. wise distribution



Graph 8:

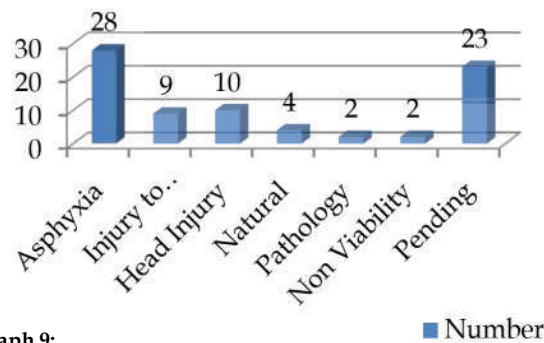
Maximum number of cases were in advanced stage of decomposition followed by moderate and initial stage of decomposition. (Table and Graph 8).

Table 9: C.O.D. wise distribution

C.O.D.	2015	2016	2017	2018	Total	Total	%
Asphyxia	01	-	01	-	02	28	70.51
Hanging	02	01	07	03	13		
Drowning	04	03	06	-	13		
Injury to Vital Organs	04	01	02	02	09	09	
Head Injury	03	02	04	01	10	10	
Natural	02	02	-	-	04	04	
Pathology	01	-	01	-	02	02	
Non Viability	-	-	01	01	02	02	
Pending	07	05	05	06	23	23	29.49
Total	24	14	27	13	78	78	100

In total 55 cases (70.51%) C.O.D. was ascertained and in 23 cases (29.49%) C.O.D. was not ascertained. (Table and Graph 9).

C.O.D. wise distribution

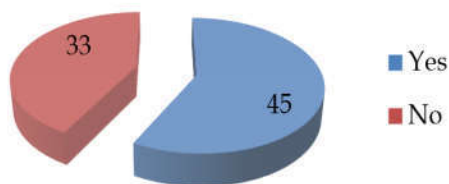


Graph 9:

Table 10: Findings of entomological evidence in dead body

Year	Entomological Evidence		Total
	Yes	No	
2015	13	11	24
2016	8	6	14
2017	11	16	27
2018	9	4	13
Total	41 (52.56%)	37 (47.44%)	78

Findings of Entomological Evidences



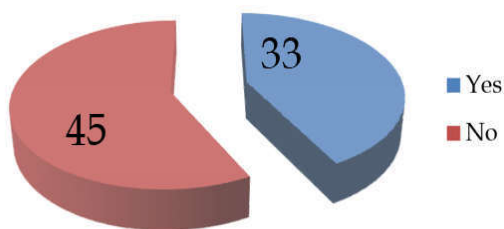
Graph 10:

In 41 (52.56%) cases entomological evidences were found and in 37 (47.44%) cases no such evidence was found. (Table and Graph 10).

Table 11: Preservation of Materials

Materials Preserved	2015	2016	2017	2018	Total
Yes	09	10	17	09	45
No	15	04	10	04	33
Total	24	14	27	13	78

Preservation of Materials



Graph 11:

In 45 cases materials were preserved during autopsy and in 33 cases no such preservation was done. (Table and Graph 11).

Discussion

Total cases of decomposed bodies from Jan 2015 to July 2018 were 78 out of 1763 i.e 4.42% of total autopsy examination carried out during the above mentioned period. During summer (March- June) season total number of decomposed cases were 38, which is 48.72% of total cases, in rainy season (July-October) total case were 29, which is 37.18% of total cases and in winter (Nov- Feb.) only 11 cases were autopsized, i.e. 14.10% of total cases. Therefore our findings according to the season wise prevalence of decomposed bodies are matching with the findings of Singh et al. (2015) [11] Indore, Madhya Pradesh and Ambade et al. (2011) [14] Maharashtra, where maximum cases of decomposed bodies were

autopsized in Summer followed by Rainy and Winter season. In our study total number of Known and Unknown decomposed bodies were 54 and 24 respectively i.e. 69.23% and 30.77%. According to age group maximum number of cases were found in age group of 21-30 (Total cases-19) and 31-40 years (Total cases- 19), below 20 years total no. of cases were 11 (14.10%), From 21-60 total cases were 56 (71.79%) 61 & Above were 11 (14.10%). Therefore age group wise our finding matches with the study of Singh et al. (2015) [11] M.P. According to sex wise distribution maximum cases were found to be of male i.e. 63 (80.76%) and number of female case were 15 (19.23%), which shows male predominance in our study which matches with the study of Cyriac Job (2009) [10], Singh et al. (2015) [11] and Ambade et al. (2011) [14]. In our study we have also found M:F ratio to be 4.2:1, which closely matches with the study of Ambade et al. (2011) [14] where M:F ratio was 3.9:1. Total no. of cases recovered from open environment were 64 (82.05%) and from closed environment total 14 (17.95%) cases were recovered and the recovery ratio of open to closed environment is 4.57:1. Total cases found with complete clothing were 38 (48.72%), partially clothed were of 29 (37.18%) and clothing were absent in 11 (14.10%) cases. Since clothing of the deceased provides an unique opportunity of identification, therefore due to recovery of maximum number of complete and partial clothing in decomposed cases reduced the number of unidentified bodies. In our study maximum number of cases were in Advanced stage of decomposition i.e. 31 (39.74%), this data is matching with the study of Singh et al. (2015) [11], where % of advanced decomposed bodies were 39.66%. In our study, in total 55 cases (70.51%) C.O.D. was ascertained and in 23 cases (29.49%) C.O.D. was not ascertained. In our study maximum no. of cases belongs to death due to asphyxia, which is 28 (35.89%) followed by Head injury i.e. 10 (12.82%), which also matches with the study of Singh et al. (2015) [11], where 36.67% cases were of death due to asphyxia.

Utility of Entomological Evidences

Entomological evidences found on dead body in decomposed state can provide vital information relating to PMI, Detection of metabolites of poisons, Postmortem relocation of corpses etc which are quite helpful for investigation purposes. Kulshrestha et al. (2005) [5], Hitosugil et al. (2014) [6], Singh H (2014) [7] and Supreme Court Judges Library enlisted document of Deoskar and Dutta

(2009) [16] had discussed the utility of entomological evidences in detail with respect to criminal investigation. Even Honorable Madras High Court in *M. Sakthivel v. The State by Inspector of Police* [17], Division bench of the Court comprising M. Jaichandran and S. Nagamuthu JJ. While setting aside the conviction and sentence imposed on the appellant (i.e. M. Saktivel) by the learned Principal Sessions Judge, Erode in S.C.No.146 of 2012, dated 17.08.2012 had mentioned the submission of defense council regarding importance and utility of entomological evidence in death investigation. In our study entomological evidences were found in 41 (52.56%) cases and in 37 (47.44%) cases no such evidences were found.

Management of Physical Evidence: Utility of preservation of viscera and other evidences during the course of autopsy can be referred from the case of *Dev Kanya Tiwari v. State of U.P.* [18] where the apex court division bench comprising N. V. Ramana and S. Abdul Nazeer JJ, while acquitting the appellant who was convicted in a case of 302 IPC held that “ 17....non-preservation of viscera by the Doctor remains fatal to the prosecution case.....” In *Md. Sayum v The State of Bihar* [19] where Navin Sinha J. of Patna High Court held that prosecution should sent viscera to FSL as early as possible. In *Joshinder Yadav v. State of Bihar* [20] division bench of apex court comprising Ranjana Prakash Desai and J. Chelameswar JJ. observed the essential need of scientific tests in criminal cases to counter the problem of hostile witness.

Conclusion

Autopsy in decomposed bodies are considered most difficult in forensic aspect, as changes in these bodies are influenced by various factors. C.O.D. can also be determined in decomposed cases if meticulous autopsy is carried out. Preservation of evidences are quite essential for the end of justice.

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Indian Journal of Hospital Administration	Semiannual	7000	6500	547	508
Indian Journal of Hospital Infection	Semiannual	12500	12000	938	901
Indian Journal of Law and Human Behavior	Tri-Annual	6000	5500	469	430
Indian Journal of Legal Medicine	Semiannual	8500	8000	607	550
Indian Journal of Library and Information Science	Triannual	9500	9000	742	703
Indian Journal of Maternal-Fetal & Neonatal Medicine	Tri-Annual	9500	9000	742	703
Indian Journal of Medical & Health Sciences	Semiannual	7000	6500	547	508
Indian Journal of Obstetrics and Gynecology	Bi-monthly	9500	9000	742	703
Indian Journal of Pathology: Research and Practice	Monthly	12000	11500	938	898
Indian Journal of Plant and Soil	Semiannual	6500	6000	508	469
Indian Journal of Preventive Medicine	Semiannual	7000	6500	547	508
Indian Journal of Research in Anthropology	Semiannual	12500	12000	977	938
Indian Journal of Surgical Nursing	Triannual	5500	5000	430	391
Indian Journal of Trauma and Emergency Pediatrics	Quarterly	9500	9000	742	703
Indian Journal of Waste Management	Semiannual	9500	8500	742	664
International Journal of Food, Nutrition & Dietetics	Triannual	5500	5000	430	391
International Journal of Neurology and Neurosurgery	Quarterly	10500	10000	820	781
International Journal of Pediatric Nursing	Triannual	5500	5000	430	391
International Journal of Political Science	Semiannual	6000	5500	450	413
International Journal of Practical Nursing	Triannual	5500	5000	430	391
International Physiology	Triannual	7500	7000	586	547
Journal of Animal Feed Science and Technology	Semiannual	7800	7300	609	570
Journal of Cardiovascular Medicine and Surgery	Quarterly	10000	9500	781	742
Journal of Forensic Chemistry and Toxicology	Semiannual	9500	9000	742	703
Journal of Global Medical Education and Research	Semiannual	5900	5500	440	410
Journal of Global Public Health	Semiannual	12000	11500	896	858
Journal of Microbiology and Related Research	Semiannual	8500	8000	664	625
Journal of Nurse Midwifery and Maternal Health	Triannual	5500	5000	430	391
Journal of Orthopedic Education	Triannual	5500	5000	430	391
Journal of Pharmaceutical and Medicinal Chemistry	Semiannual	16500	16000	1289	1250
Journal of Plastic Surgery and Transplantation	Semiannual	26400	25900	2063	2023
Journal of Practical Biochemistry and Biophysics	Semiannual	7000	6500	547	508
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