

The Causes of Death on Exhumation in Pakistan

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ABSTRACT

Objective: To study the causes of death on Exhumation in Pakistan.

Study Design: Retrospective observational study.

Place and Duration of Study: This study was carried out at Forensic medicine Department BMC Banu, Saido Medical College Sawat, Baynzir District Hospital Rawalpindi and Baynzir District Hospital Abbottabad from Jan 2008 to 31 March 2014

Materials and Methods: 200 cases of exhumation were included in this study which were conducted approximately in six years and four months by the medical boards of Banu, Sialkot, Rawalpindi and Abbottabad. The data was taken on proforma with the permission of the authorities which was based on exhumation conducted in these districts. The data was analyzed for results. Cases of deceased where cause of death was determined either by external and internal examination or by histological examination / chemical analysis of viscerae were included in this study. Partially decomposed, advancedly decomposed or skeletonized bodies, with no internal or external injuries sufficient to cause death and histological and toxicological reports failing to reveal any abnormal findings, were also included in the study. Different variables of bodies e.g., sex, age, time of death & disinterment, corpse condition and burial site were analyzed using statistical package for social services (SPSS) version 13.

Results: There were maximum cases of exhumation 60 cases (30 %) at the disinterment time of 5 – 8 months and there were minimum cases 13 (6.5 %) at the disinterment time more than 2 years. It was seen that in 59 cases of exhumation (29.5 %) the dead body was fresh, 89 cases (44.5) the dead body was partially decomposed, in 29 cases (14.4 %) the dead body was advancedly decomposed and in 23 cases the corpse were almost skeletonized. There were 143 cases (71.5 %) belong to rural area and 57 cases (28.5 %) belong to urban area. The maximum cases 100 (50 %) were of age group 31 – 40 years and minimum cases of exhumation 12 (6 %) were of age group more than 50 years. It was also seen that there were 173 (86.5 %) male dead bodies were exhumed and only 27 cases (13.5 %) were of female dead bodies. In this study there was the cause of death in 13 cases (6.5 %) due to Fire arm injury, 07 cases (3.5 %) due to stab wound of the trunk, 9 cases (4.5 %) due cut throat, 18 cases (0.9 %) due to blunt injury of head and chest, 0.5 cases (2.5 %) due to poisoning, 06 cases (03 %) due to asphyxia and 142 cases (71.5 %) the cause of death was unascertained due to advance decomposition or almost skeltonized corpse.

Conclusion: Delayed exhumation due to lengthy legal procedures involved in carrying out this process leading to decomposition of bodies, resulting in unascertainable cause of death. Early decomposition of bodies due to multiple reasons like hot climate, water logging and salinity, improper drainage of graveyards etc is a bar to ascertain cause of death.

Key Words: Exhumation, causes of death, decomposition and skeltonized.

INTRODUCTION

Exhumation carried out after obtaining an appropriate permission from the state, is digging up or removal of buried body from the grave or ground¹. The main purpose of performing the exhumation is to determine the cause of death when foul play is suspected², but this is also done for identification purposes required in some civil and criminal cases³. Though it is a key to determine the cause of death especially in homicidal cases but sometimes it is not determined and acknowledged as unascertained because examination of disinterred body is by no means infallible in revealing the cause of death⁴, and herein no abnormality is detected on gross examination of body and histological, toxicological and microbiological procedures are insignificant⁵. Decomposition is not only a bar to

successful examination but it may also reduce the possibility of obtaining samples, resulting in failure to establish the cause of death⁶. Various factors influencing the decomposition are time elapsed between burial and exhumation, seasonal environment, soil conditions and coffin material⁷. Other reasons for unascertainable cause of death are infectious diseases, cardiac lesions, metabolic & blood disorders, allergy, anaphylactic reactions, acute neurogenic cardiac failure, electrical injuries, sudden infant death syndrome etc⁸. This study was planned to look for rate and its possible reasons of unascertained cause of death in exhumation carried out in above said districts.

MATERIALS AND METHODS

200 cases of exhumation were included in this study which were conducted approximately in Six years and

four months by the medical boards of Banu, Sialkot, Rawalpindi and Abbottabad. The data was taken on proforma with the permission of the authorities which was based on exhumation conducted in these districts. The data was analyzed for results. Cases of deceased where cause of death was determined either by external and internal examination or by histological examination / chemical analysis of viscerae were included in this study. Partially decomposed, advancedly decomposed or skeletonized bodies, with no internal or external injuries sufficient to cause death and histological and toxicological reports failing to reveal any abnormal findings, were also included in the study. Different variables of bodies e.g., sex, age, time of death & disinterment, corpse condition and burial site were analyzed using statistical package for social services (SPSS) version 13.

RESULTS

There were maximum cases of exhumation 60 cases (30 %) at the death & disinterment time of 5 – 8 months and there were minimum cases 13 (6.5 %) at the death & disinterment time more than 2 years as shown in Table No 1. It was seen that in 59 cases of exhumation (29.5 %) the dead body was fresh, 89 cases (44.5) the dead body was partially decomposed, in 29 cases (14.4 %) the dead body was advancedly decomposed and in 23 cases the corpse were almost skeletonized as shown in Table No 2.

Table No.1: Frequency distribution according to time between death & disinterment (n=200)

S. No	Time of disinterment	No of cases	Percentage (%)
01	1 – 4 months	34	17 %
02	5 – 8 months	60	30 %
03	9 – 13 months	38	19 %
04	14 19 months	25	12.5 %
05	20 – 24 months	30	15 %
06	> 2 years	13	6.5 %
	Total	200	100 %

Table No.2: Frequency distribution according to condition of the corpse (n=200)

S. No	Condition of the Corpse	No. of cases	Percentage (%)
01	Fresh	59	29.5 %
02	Partially Decomposed	89	44.5 %
03	Advancedly decomposed	29	14.5 %
04	Almost Skeletonized	23	11.5 %
		200	100 %

There were 143 cases (71.5 %) belong to rural area and 57 cases (28.5 %) belong to urban area as shown in Table No 3. The maximum cases 100 (50 %) were of

age group 31 – 40 years and minimum cases of exhumation 12 (6 %) were of age group more than 50 years as shown in Table No 4. It was also seen that there were 173 (86.5 %) male dead bodies were exhumed and only 27 cases (13.5 %) were of female dead bodies as shown in Table No 5. In this study there was the cause of death in 13 cases (6.5 %) due to Fire arm injury, 07 cases (3.5 %) due to stab wound of the trunk, 9 cases (4.5 %) due cut throat, 18 cases (9 %) due to blunt injury of head and chest, 05 cases (2.5 %) due to poisoning, 06 cases (03 %) due to asphyxia and 142 cases (71.5 %) the cause of death was unascertained due to advance decomposition or almost skeltonized corpse as shown in Table No 6.

Table No.3: Frequency distribution according to urban and rural areas (n=200)

S. No	Area	No. of cases	Percentage (%)
01	Rural	143	71.5 %
02	Urban	57	28.5 %
		200	100 %

Table No.4: Frequency distribution according to age (n=200)

S. No	Age group (years)	No. of cases	Percentage (%)
01	10 – 20	23	11.5 %
02	21 – 30	41	20.5 %
03	31 – 40	100	50 %
04	41 – 50	24	12 %
05	> 50	12	06 %
	Total	200	100 %

Table No.5: Frequency distribution according to sex (n=200)

S. No	Sex groups	No. of cases	Percentage (%)
01	Male	173	86.5 %
02	Female	27	13.5 %
	Total	200	100 %

Table No.6: Frequency distribution according to causes of death (n=200)

S. No	Causes of death	No. of cases	Percentage (%)
01	Fire Arm injury	13	6.5 %
02	Stab	07	3.5 %
03	Cut throat	09	4.5 %
04	Blunt injury	18	09 %
05	Poisoning	05	2.5 %
06	Asphyxia	06	03 %
07	Undetermined	142	71.5 %
	Total	200	100 %

DISCUSSION

Exhumation though considered as sacrilege, is some times requested by the heirs of deceased when there are

mysteries about the cause of death⁹. In this region the undue delay to conduct exhumation is due to fear of dishonor and elders of the family usually avoid disinterment of near and dear ones. In this study cause of death remained undetermined in two third of cases (71.5%) due to advanced decomposition of the corpse. The cause of decomposition was due to undue delay of disinterment. Our results are not similar to one national study (34% failure rate) conducted by Qazi et al in 2004. However Memon U & Memon A¹⁰ have reported higher percentage of 42.85% of cases in which cause of death could not be determined. In various German studies, failure to reach the cause of death in exhumed bodies have been reported by Verhoff et al, Seibel et al, and Grellner et al¹¹ to be 0.8%, 4.23% and 22% respectively. Higher percentage of failure to reach the cause of death in exhumed bodies in our areas is because of early putrefactive changes due to hot climate, water logging and salinity and improper drainage system around the grave yard. Further more in neurogenic death, no pathological changes can be detected¹². High successful exhumation rates in Germany is due to delayed putrefaction of corpse because of cold season in many months of year and application of sophisticated diagnostic techniques like immunocytochemistry¹³.

Despite the limitations, exhumation may provide surprisingly good results about the cause of death but the same is less likely to be achieved with passage of every day¹⁴. In our study majority of bodies 30% (60) were exhumed at 5 – 8 months after the death, and most of the bodies, 50% cases were in stage of advanced decomposition or fully skeletonized. Our observations were consistent with Hussain et al¹⁵ who found advanced putrefaction in 80.4% of bodies exhumed from 4 months to 01 year after the death. However Breitmeier et al¹⁶ have shown evidence of significant morphological features in soft tissues and internal organs sufficient to diagnose the cause of death in exhumations performed after several years. Marked decomposition observed in exhumed bodies above two years after the death of persons is responsible for failing to reach the conclusion, as the cause of death is to be inferred from soft tissue in majority of cases¹⁷. But delay in putrefaction observed in European countries like Germany improves the positive yield in exhumations many months or even years after burial of deceased.

In our study male corpse were more (86.5%) than females (13.5%) in the ratio of about 4:1. This finding is comparable with one national study conducted at Peshawar where male fatalities are reported in 86.4% of cases. Females in this society being least victims of violent deaths are due to fact that they hold honorable place even by enemies and spared from tribal and family disputes because of religious, cultural and traditional customs¹⁸. In this study majority of victims

belonged to rural areas (about 71.5%), and some 28.5% were belong to urban area. Our study is comparable with Qazi et al¹⁰ who have reported rural folk involvement in 77% of cases. Regarding age our findings are in contrast with an international study conducted at U.K⁶ where the incidence of unascertained death appears higher in children and young adolescents. Predominance of rural people in our study is due to high illiteracy rate and their ignorance about codal procedures causing delay in conduct of exhumation process. More cases of middle age may be due to involvement in violent activities and this age is more vulnerable to different diseases like acute myocardial infarction where no positive findings are found on disinterment. It was also seen in this study the cause of death was more as blunt injuries of the head and chest and in 71.9 % the cause of death was undetermined due to advanced putrefaction of the corpse and non availability of advance techniques for exhumation.

CONCLUSION

Delayed exhumation due to lengthy legal procedures involved in carrying out this process leading to decomposition of bodies, resulting in unascertainable cause of death. Early decomposition of bodies due to multiple reasons like hot climate, water logging and salinity, improper drainage of graveyards etc is a bar to ascertain cause of death.

Recommendations: On the basis of findings in our study we can recommend that:

1. Legal procedures may be simplified so that exhumation can be performed as early as possible to avoid putrefactive changes.
2. Proper drainage of graveyards be maintained to avoid early putrefaction.

REFERENCES

1. Exhumation. Available at: www.brighton-hove.gov.uk/ [Cited 15 Dec 2009]
2. Kremer C, Sauvageau A. Legally interred and unlawful Burials: A Retrospective Study of Exhumation Cases in the province of Quebec, Canada. *The open Forensic Sci J* 2008;1:16-18.
3. Baden MM. Exhumation–Time of death and changes after death. In: Spitz WU, editor. *Spitz and Fisher's medicolegal investigation of death: guidelines for the application of pathology to crime investigation*. 4th ed. Springfield: Charles C Thomas Publisher Ltd; 2006.p.174-83.
4. Kirishan V. *Obscure Autopsy*. In: Kirishan V, editor. *Text book of Forensic Medicine and Toxicology*. 3rd ed. New Delhi: Elsevier Publisher; 2005.p.45-54.
5. Khan MU, Jan A, Munwar AZ, Mughal MI. Frequency of negative autopsy and their

- demographic evaluation at Khyber Medical College Peshawar. JPMI 2007;21(2):132-135.
6. Why might cause of death be unascertained. MDTA 2004;2:1-5.
 7. Verhoff MA, Ulm K, Kreutz K, Muller KM, Stachetzki U, Exhumation as a matter of fact. Int J Forensic Med and Toxi 2007;8(1):1-10.
 8. Shapiro HA. The Medical Investigation of the cause of deaths: Sudden, Rapid and Unexpected Deaths in Adults, Children and Infants. In: Gordon I, Shapiro HA, editors. Forensic Medicine a guide to principles. 2nd ed. Edinburgh: Churchill livingstone;1988.p.160-179.
 9. Seibel O, Junge M, Heinemann A, Schulz F, Puschel K. Frequency and Findings of Exhumations in Hamburg. Versicherungsmedizin 1997;59(6):209-15.
 10. Qazi A, Afridi HK, Aziz K. Exhumation; A tool to establish cause of death. Ann King Edward Med Uni 2006;12(4):490-2.
 11. Memon U, Memon A. Necropsy after exhumation: limitations and value. Specialist: Pak J Med Sci 1995;11:313-7.
 12. Grellner W, Glenewinkel F. Exhumations: synopsis of morphological and toxicological findings in relation to the postmortem interval. Survey on a 20-year period and review of the literature. Forensic Sci Int 1997;90:139-59.
 13. Karger B, Lorin de la Grandmaison G, Bajanowski T, Brinkmann B. Analysis of 155 consecutive forensic exhumations with emphasis on undetected homicides. Int J Legal Med 2004;118:90-4.
 14. Necropsy after exhumation (Editorial). Br Med J 1969;4(5674):6.
 15. Hussain Z, Ali MA, Saeed A, Khalil IR. Exhumation; analysis and forensic importance. The Professional 2002;9 (4):347-351.
 16. Breitmeier D, Graefe-Kirci U, Albrecht K, Weber M, Troger HD, Kleemann WJ. Evaluation of the correlation between time corpses spent in in-ground graves and findings at exhumation. Forensic Sci Int 2005;154(2):218-223.
 17. Awan NR. Autopsy and exhumation. In: Awan NR, editor. Principle and practice of Forensic medicine. Lahore: Sublime Arts; 2002.p.118-30.
 18. Rana PA, Farrukh. R, Malik. SA, Rasheed. A. Incidence of fatal poisoning in the city of Lahore. A retrospective study during 1984-88 Lahore. Ann KE Med Coll 2000; 6:112-15.

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