ORIGINAL ARTICLE

Ligature Materials and postmortem Findings in Hanging Cases Brought for Autopsy at a Tertiary Care Hospital of Sindh. Pakistan

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ABSTRACT

Objective: To study the ligature materials and postmortem findings in hanging cases brought for autopsy at a tertiary care hospital of Sindh, Pakistan

Methods: The current retrospective study was conducted in the department of Forensic Medicine and Toxicology LUMHS Jamhoro, Hyderabad and Medico-legal section of Liaquat University Hospital Hyderabad, study covers the duration of August 2014 to July 2017.

A sample of 100 autopsy cases was selected according to criteria of inclusion and exclusion. Ligature material used and postmortem examination findings were noted in a preformed Profroma. Data variables were noted, compiled, tabulated and analyzed on Excel sheet. Study variables were analyzed by descriptive statistics.

Results: Of 100 autopsy cases, male were 83% and 17% were female. Majority of cases belonged to fourth decade (38%). Ligature mark was categorized as above, at the level and below the level of thyroid cartilage were noted in 94%, 2% and 4% of cases respectively (P=0.001). Nylon rope (42%), jute rope (16%) and cotton rope (11%) were most common in male while cotton Dopatta (7%) was common among female. Tongue protrusion (81%), bluish discoloration (79%), petechiae (71%) and salivary stains (37%) were common noted postmortem findings.

Conclusion: The present study reports nylon rope as most common ligature in male and cotton dopatta in female. Tongue protrusion, bluish discoloration, petechiae and salivary stains were promient postmortem findings.

Key Words: Autopsy, Hanging, Ligature, Postmortem Findings

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INTRODUCTION:

Hanging is widely used way of committing suicide. It is a type of asphyxial death. Hanging is defined as asphyxial death caused by suspension of a ligature around neck in which the constricting force is weight of the body[1]. The symptoms of hanging include subjective sensations such as the ringing in ears, light flashes and loss of consciousness. Death is very rapid in hanging hence it is termed as a painless way of death[2]. Estimates of World Health Organization (WHO) show approximately 900,000 hanging cases that die globally per annum[3]. Subjective thought of hanging oneself comes progressively or as an impulse[4]. Hanging is adopted as a last resort of getting relief from the grievances in suicidal cases when other forms have failed such as the poisoning or cutting the throat deliberately. Hanging is a leading cause of asphyxial deaths particularly in suicidal cases[5]. Hanging, being easy method, is commonest way of committing suicide for those who wish no more living[6]. Hanging is easy in sense that a slight force is sufficient to cause painless death within seconds. Constricting force may be whole body weight in cases of complete hanging or weight of the head in cases of

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incomplete/partial hanging. In cases of partial hanging, only the head and chest are off the ground. Partial hanging shows the toes or feet are often touching the group and rest of body is lying on the ground. Kneeling down is observed in partial hanging[6]. The present is a retrospective study showing the patterns of cervical injury in hanging cases brought for autopsy at our tertiary care hospital. In addition, we attempted to include demographic characters of gender and age of hanging cases.

METHODS:

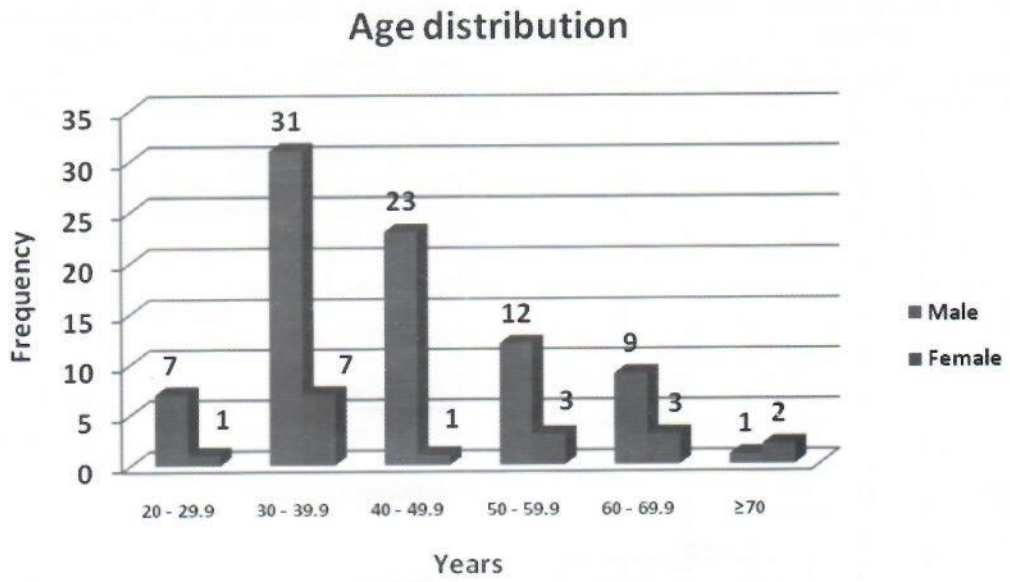
The present retrospective study was carried out in the Forensic Medicine and Toxicology LUMHS Jamhoro, Hyderabad and Medico-legal section of Liaquat University Hospital Hyderabad. The study covers the duration of August 2014 to July 2017. Ethical approval was taken in advance from the Institute`s Ethical Committee. Protocol was elaborated before conducting the study. Records of autopsy cases of hanging were observed. Of 340 autopsy cases, a sample of 100 autopsy cases was sorted for the study purpose according to criteria of inclusion and exclusion. All autopsies of alleged history of hanging qualified for inclusion while violent asphyxial deaths other than hanging were excluded. Emergency records, Notes of medicolegal officers, police notes and file records were observed. Age, gender, level of ligature material, type of ligature material and types of hanging and post mortem examinations findings were noted in a preformed Profroma. Police papers, inquest reports, hospital records and autopsy findings were keenly observed to fulfill the inclusion criteria. Collected data variables were noted in a pre- structured proforma. Data was compiled, tabulated and analyzed on Excel sheet. Study variables were analyzed by descriptive statistics. Continuous variables (age) were analyzed by Student`s t-testing. Categorical variables (gender) were cross tabulated and the results presented as frequency and %.

RESULTS:

Of 100 autopsy cases, male were 83% and 17% were female. Male to female (M: F) ratio was calculated as 4.88:1. Mean (±SD) age of total sample was 40.1±13.5 years for both genders. Majority of cases belonged to fourth decade (38%), followed by fifth decade (24%) and sixth decade (15%) (P=0.0001) (Table-I and graph-I). Table-II shows the complete and incomplete hanging noted in 82% and 18% of cases respectively (P=0.0001) (Graph-II). Table-III shows the level of ligature mark was categorized as above, at the level and below the level of thyroid cartilage were noted in 94%, 2% and 4% of cases respectively (P=0.001). This shows majority of cases were having ligature mark above the thyroid cartilage. Hyoid or thyroid cartilage fracture was not observed in the present study. Table-IV shows the type of ligature material used by hangers. Nylon rope (42%), jute rope (16%) and cotton rope (11%) were most common in male while cotton Dopatta (7%) was common among female (graph-IV). Post mortem examination findings of victims are summarized in table-V (graph-V). Tongue protrusion (81%), bluish discoloration (79%), petechiae (71%) and salivary stains (37%) were common noted postmortem findings (Graph- V).

Table I. Distribution of Age and Gender of Autopsy Cases (n=100)

Age (Years)	Male	Female	Total
20 - 29.9	7	1	8
30 - 39.9	31	7	38
40 - 49.9	23	1	24
50 - 59.9	12	3	15
60 - 69.9	9	3	12
≥70	1	2	3
Total	83	17	100



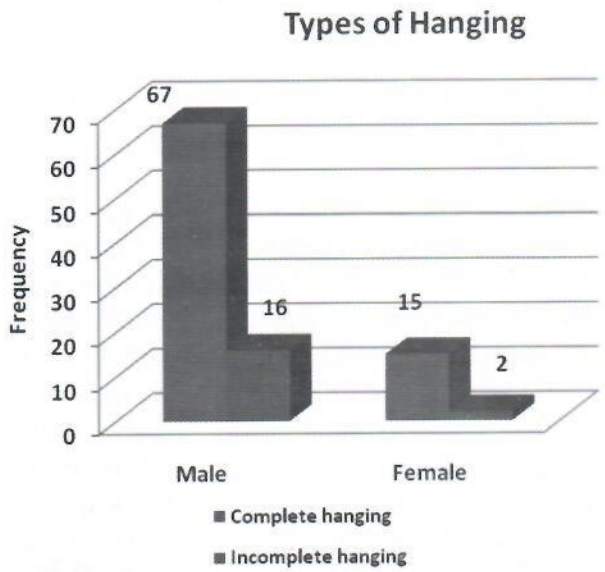
Graph I. Age Frequency of Autopsy Bodies

Table II. Types of Hanging (n=100)

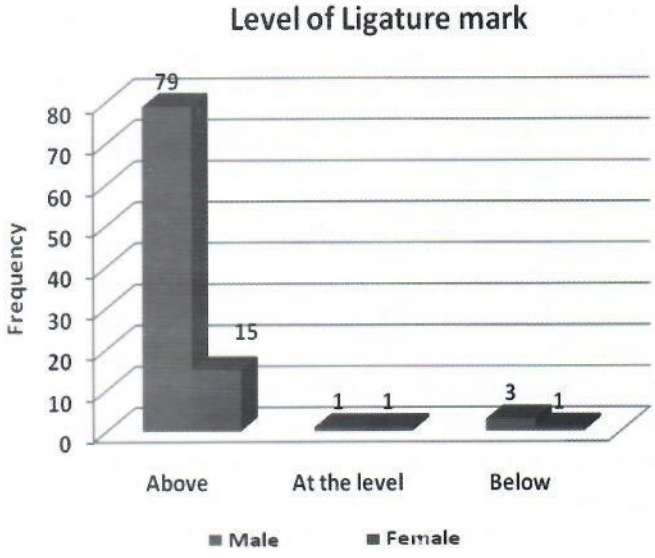
Hanging Types	Male	Female	Total
Complete Hanging	67	15	82
Incomplete Hanging	16	2	18
Total	83	17	100

Table III. Level of Ligature Mark (n=100)

Thyroid Cartilage	Male	Female	Total
Above	79	15	94
At the Level	1	1	2
Below	3	1	4
Total	83	17	100



Graph II. Frequency of Types of Hanging



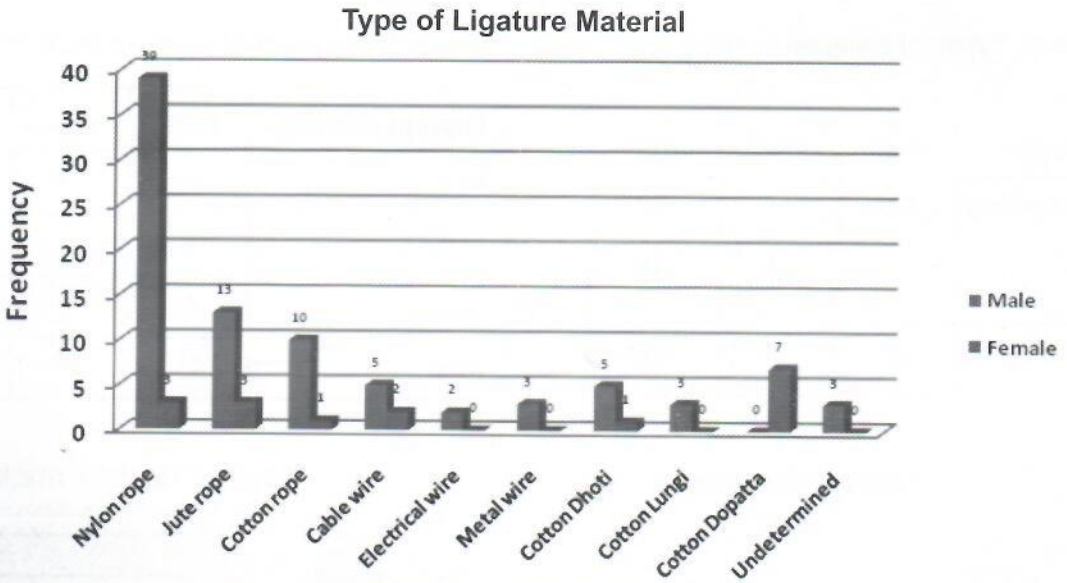
Graph III. Frequency of Level of Ligature Mark

Table IV. Types of Ligature Material (n=100)

Ligature Material	Male	Female	Total
Nylon rope	39	3	42
Jute rope	13	3	16
Cotton rope	10	1	11
Cable wire	5	2	7
Electrical wire	2	0	2
Metal wire	3	0	3
Cotton Dhoti	5	1	6
Cotton Lungi	3	0	3
Cotton Dopatta	0	7	7
Undetermined	3	0	3
Total	83	17	100

Table V. Postmortem Examination Findings of Victims (n=100)

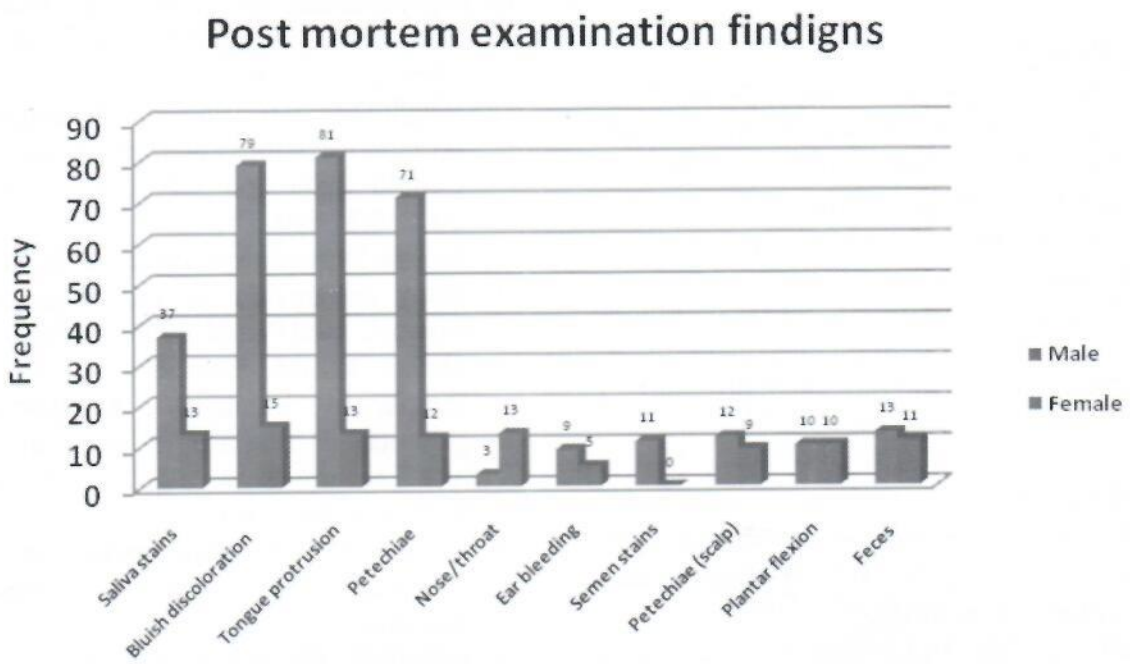
Postmortem Findings	Male	Female
Saliva Stains	37	13
Bluish Discoloration (lips, fac)	79	15
Tongue Protrusion	81	13
Petechiae (Conjunctiva)	71	12
Nose/Throat Bleeding	3	13
Ear Bleeding	9	5
Semen Stains	11	0
Petechiae (Scalp)	12	9
Feet Planter Flexed	10	10
Feces	13	11



Graph IV: Type of Ligature Material

DISCUSSION:

In this retrospective study cases of autopsies of alleged history of hanging were included. The age, gender, level of ligature material, type of ligature material and types of hanging and post mortem examinations findings were collected. Of 340 autopsy cases, a sample of 100 autopsy cases was sorted out that fulfilled the inclusion criteria. Of 100 autopsy cases, male were 83% and 17% were female. Male to female (M: F) ratio was calculated as 4.88:1. Mean (±SD) age of total sample was 40.1±13.5 years for both genders. The findings are in agreement with previous studies[7-10]. The male gender finding of 83% is in agreement with a recent study[11] that reported 85% victims were males and 15% victims were female. Shrivastava et al[7] reported 137(67.5%) were male victims and 66 (32.5%) were females, the findings are discordant to the present study as male were noted in 83% of cases. This may be due to different geographical areas and social values. In present study, the majority of cases belonged to fourth decade (38%), followed by fifth decade (24%) and sixth decade (15%)



Graph V: Postmortem Examination Findings

(P=0.0001) (Table 1 and graph 1). Waghmode et al[11] reported similar age categories of 4th decade (33.33%), followed by 5th (18.33%) and 6th decade (17.5%). Our findings are also concordant with a previous study[12] that reported similar age categories. However a recent study by Shrivastava et al[7] have reported 3rd decade as common (24.1%) and 2nd decade in female (12.3%). This is in contrast to present and previous studies[8-10]. In present study, the majority of victims belonged to 3rd decade among males were 49 (24.1%), followed by 4th decade were 44 (21.7%) while 2nd decade was most common among females were 25 (12.3%), followed by 3rd decade were 24 (11.8%). In present study, the complete and incomplete hanging noted in 82% and 18% of cases respectively (P=0.0001) (Graph-II). The findings are in agreement with recent study of Waghmode et al[11] that reported complete hanging in 75% victims and partial hanging in 30(25%) victims. Our finding is also supported by previous study of Shaikh et al.[13] However, recent study of Shrivastava et al[7] reported typical hanging 12.3% cases while atypical hanging in 72.4% of cases. In present study, the level of ligature mark above, at the level and below the level of thyroid cartilage was noted in 94%, 2% and 4% respectively (P=0.001). This shows majority of cases were having ligature mark above the thyroid cartilage. The findings are in agreement with Waghmode et al[11] that reported in 87.5% cases the ligature mark above the level of thyroid cartilage. Our findings of ligature mark are also in agreement previous studies[14,15]. In present study, the nylon rope (42%) was most common followed by jute rope (16%) and cotton rope (11%) in male while cotton Dopatta (7%) was common among female. Waghmode et al[11] reported similar findings of nylon material being the commonest (65%) in their study. Our findings are also dissimilar to reported by Vijayakumari et al[10] and Modi et al[19]. However, Shrivastava et al[7] (2018) reported nylon rope in 15.7% cases. Cotton Dopatta in female was commonest ligature material that is consistent with previous studies[16,17]. Tongue protrusion (81%), bluish discoloration (79%), petechiae (71%) and salivary stains (37%) were common noted postmortem findings. The findings are similar to prevuios studies[11,17-19]. Shaikh et al[13] reported tongue protrusion in only 38.37% cases. The present study noted nylon rope as most common ligature in male and cotton dopatta in female while tongue protrusion, bluish discoloration, petechiae and salivary stains were

promient postmortem findings.

CONCLUSION:

In the present study of hanging cases, 83% were male and 17% were female. Majority of cases belonged to fourth decade of life. The complete and incomplete hanging was noted in 82% and 18% of cases respectively. Nylon rope was most common ligature in male and cotton dopatta in female. Tongue protrusion (81%), bluish discoloration (79%), petechiae (71%) and salivary stains (37%) were common noted postmortem findings.

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