Patterns and Determinants of Medicolegal Cases in Tertiary Care Hospital

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Abstract

Globally medicolegal injuries contribute towards huge burden of diseases .The mortality arising from trauma due to road traffic accidents, poisoning etc are expected to be doubled in near future. There is dearth of assessment of this public health issue especially in developing countries which justifies the current research on this unique subject.

Objective:

To assess the medico legal cases along with underlying causes and their clinical outcome attending the casualty of tertiary care setting i.e. Liaquat University Hospital Hyderabad/Jamshoro, Sindh Pakistan during the period 01st Dec 2019 to 30th May 2020.

Methodology:

This descriptive cross sectional study was designed to assess the profile of 487 medico legal cases attending the emergency department of tertiary care Liaquat University Hospital Hyderabad/Jamshoro, Sindh Pakistan. The data was collected for period of six months by using a questionnaire that included the information regarding demographic determinants of medico legal cases (MLCs) and some information about medico legal officers (MLOs)&post-graduation; participants were interviewed on one-to-one basis. The data was analyzed by using Statistical Package for Social Sciences (SPSS) for windows version 23.0 for windows. The continuous variables were analyzed as mean ± standard deviations, the frequencies were measured for categorical variables. Chi-Square (X^2) test applied as test of significance at p-value ≤ 0.05 as cut-off for level of significance.

Results:

Among 487 MLCs having gender wise distribution of male 277 (56.87%) and female 210 (43.13%). The number of poisoning cases were 76 (15.6%) in which males were 33 (6.77%) and females were 43 (8.82%), RTA were reported among 51 (10.47%) and firearm injuries were recorded in 34 (6.98%).Out of all 487 respondents 129 were illiterate and 154 (31.6%) were only primary pass. There were 146 (29.9%) poor victims and 155(31.8%) victims belonged to fairer socio-economic status; there was a significant association of gender identified with multiple factors like self-inflected injuries ($p<0.02$) as well as the poison taken by victim ($p<0.05$). Also, there were found significant association of gender with multiple determinants of MLCs like with self-inflected injuries ($p=0.01$).

Conclusion:

Among all medico legal cases, the poisoning due to various substances was the most commonly reported. The stab injuries, sexual assault, firearm injuries in term of occurrence were found significantly associated with lack of education. More elaborated research is needed to completely explore this important public health issue.

Key Words: Medico Legal Cases, Road Traffic Accident, Stab Injury, Poisoning, Sexual Assault, Fall from Height

Introduction

The injury or illness, where inquiry by the law enforcing institutes are required to fix the liability regarding its reason, is known as medico legal case[1]. Such cases are an important part of medical practice which is mostly faced by the doctors performing duties in emergency department and dealing with law related cases. While dealing with medico legal cases, the medico legal officer (MLO)gets detailed information and performs examination of the injured to decide that some interrogation is mandatorily to be carried out by law enforcing institutes to reveal ground realities in order to deal with case under law of the state[2].The list of medico legal cases is exhaustive including criminal offence like blunt or sharp injuries, assault, road traffic accidents (RTAs), poisoning, industrial accidents, alcoholic intoxications & fire arm injuries which are commonly reports in causality departments in most of the hospitals[3].The Emergency department is therefore considered as a major pillar of every hospital [4].

Globally, medico legal injuries contribute around16% of the burden of diseases; this burden is expected to double in coming few decades [5]. The low and middle income countries bear 2/3rd of this burden and Southeast Asian and Western Pacific regions are reporting the maximum number of mortalities due to medico legal injuries[6]. In developing world, RTAs c are reported as the second leading event among medico legal cases[7,8]. Moreover, many fold increase in risk by transport injuries depends upon the type of transport, high speed and mechanization[9]. The automotive revolution contributed an increase of motorization of urban slums particularly in the developing countries[10]. The youth is badly affected due to RTAs[11]. The non-implementation of road safety policies in developing countries like Pakistan is one of the major determinant[12]. An official report in Pakistan narrates hundreds of thousands mortalities resulting from RTAs

occurring every year[13]. This accounts for 24% of mortalities reported in Eastern Mediterranean Region[14].

The world statistics shows high figures for sexual assault, also. Globally, 20% females are reported as sexually abused in their childhood [15]. Sexual violence reported among women in Japans' about 16%while this figure is 25% in India[16, 17]and 53-62% in Bangladesh. The worldwide burden of burn injuries is 19 percent[18]. The occurrence of burn injuries is alarmingly high in India and it is expected to be the next leading cause after RTAs [19].

Poisoning is one of the main reason of ailment and fatality globally [20]. Annual mortality due to various poisoning agents is about 0.3 million people in reference to the World Health Organization (WHO) [21]. There are multiple determinants of poisoning including stress due to financial losses, chronic diseases, marital disharmony and family problems & mental illnesses[22,23].The mode of poisoning may be accidental or intentional related with the age group affected[24]. Accidental poisoning includes mothballs, anti-flea and tick product, cleaning solutions, nail polish remover and thinner, whilst in the youth and adults, poisoning occurred by using medications, organo- phosphorus compounds and harmful chemicals used in houses for washing and sanitary purposes[,25].Changes in social behavior, life style , rapid industrialization, excessive use of pesticides in agriculture, unaccountable availability of medicines and harmful chemicals are the specific determinants of poisoning related deaths [26,27,28]. The prevention of emergencies in future and to guess the burden of crime profiling of medico legal cases is very essential [29, 30].

The efforts have been made in this study to point out the patterns & determinants of different medico legal cases in Hyderabad; the second largest city of Sindh, Pakistan. The findings and

recommendations of this study are an eye opener about the burden of medico legal cases in this populous city which could be used by the law enforcing institutes and policy makers to develop strategies to strengthen the law & order situation and to minimize the intensity of these crimes.

Objectives:

1. To estimate the profile of MLCs attending emergency department of tertiary care hospital along with underlying cause.
2. To determine associations between socio-demographic profile of the medico legal cases & types of medico legal cases reported at study setting.

METHODOLOGY:

Study Setting:

Casualty department of Liaquat University of Medical & Health Sciences, Hyderabad/ Jamshoro, Sindh Pakistan.

Study Design:

Descriptive cross sectional study was conducted to assess the profile of MLCS attending emergency department of tertiary care hospital along with underlying cause.

Study Period:

Six months i.e. 1st December 2019to 30th May 2020.

Study Population:

All MLC cases attending emergency department, LUH Hyderabad, Sindh, Pakistan.

Sample Size & Sampling Technique:

Four hundred & eighty seven patients registered in MLC department of either gender reporting at study setting& whose complete information was accessible from office record, were selected by convenient sampling technique.

Data Collection Method:

The data was collected from MLC registers, hospital case files of medico legal available to MLC officers, the telephonic conversation. The data regarding demographic variable like age, gender , marital status, educational status, occupation, residential status, socio-economic status. Other variables of especial interest included patterns of medico legal cases, types of assaults, hospital arrival time etc was collected on pre-designed and pre-tested questionnaire.

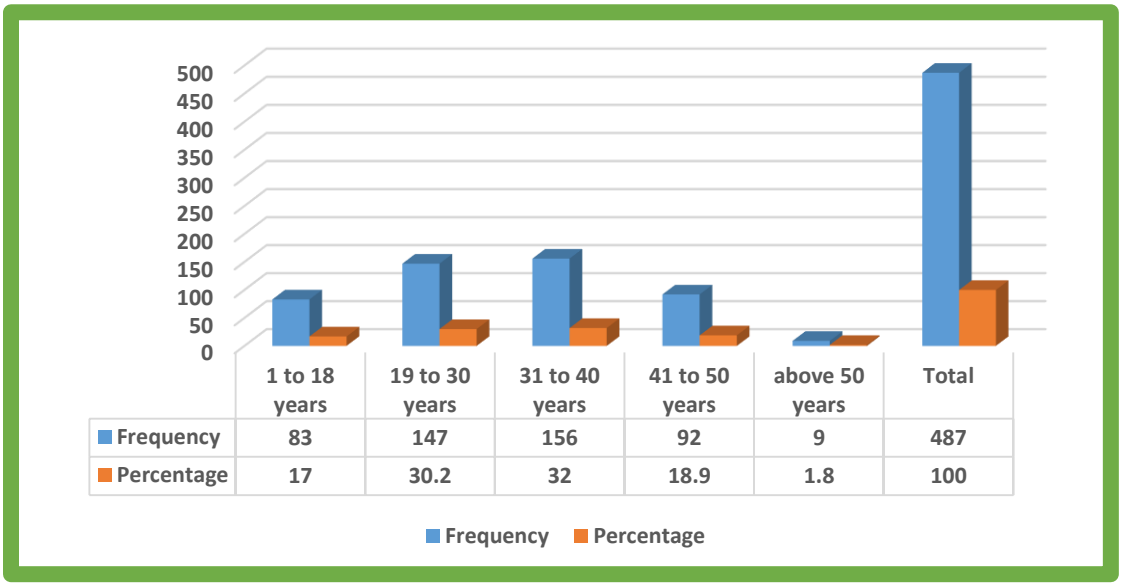
Data Analysis:

The data was analyzed by using Statistical Package for Social Sciences (SPSS) version 23.0 for windows. The frequency tables and bar or charts computed for categorical variables. The continuous variables were analyzed as mean ± standard deviations. Chi-Square (X^2) test applied as test of significance at p-value ≤ 0.05 as cut-off for level of significance.

Results:

Graph#1

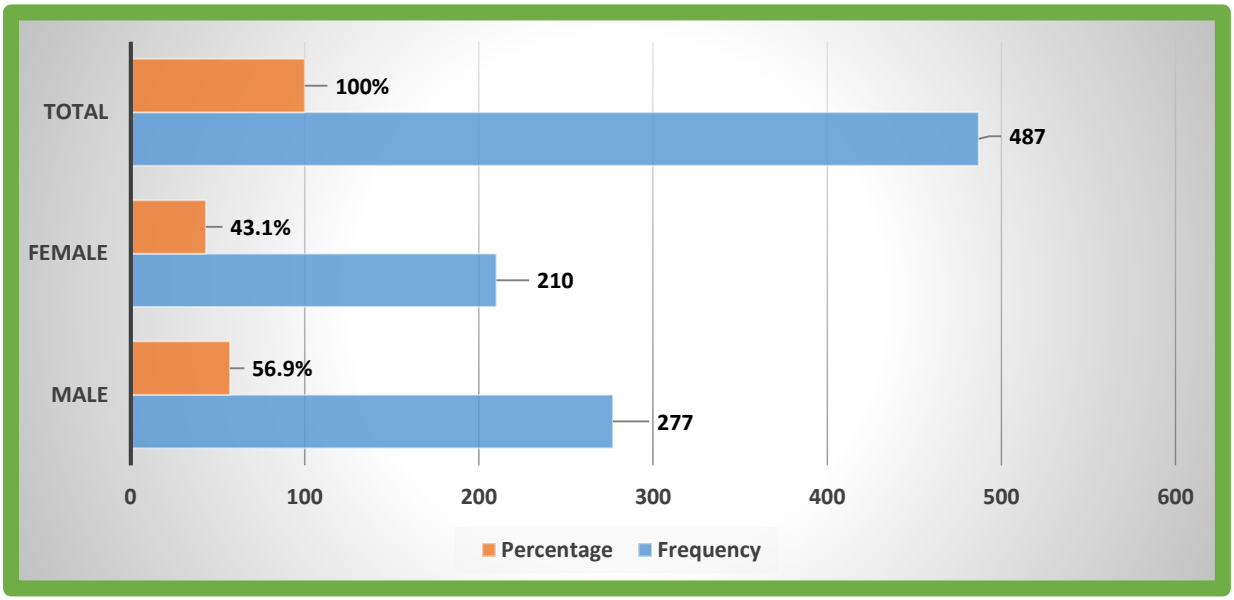
Age wise Distribution of Medico legal Cases



	1 to 18 years	19 to 30 years	31 to 40 years	41 to 50 years	above 50 years	Total
Frequency	83	147	156	92	9	487
Percentage	17	30.2	32	18.9	1.8	100

Graph#2

Gender wise distribution of Medico legal Cases



Table#1

Demographic Profile of Medico legal Cases

Demographic Characteristics	*f*(%) (no=487)
Marital Status	
Married	146 (30.0%)
Un-married	263(54.0%)
widow	44(9.0%)
Divorced	34(7.0%)
Educational Status	
Illiterate	129(26.5%)
Primary	154(31.6%)
Secondary	137(28.1%)
Higher than secondary	67(13.8%)
Occupation	
Student	72(14.8%)
Government Employee	32(6.6%)
Private Employee	127(26.1%)
Un Employee	122(25.1%)
Self Employed	68(14.0%)
Labor	66(13.6%)
Socio economic Status	
Good	186(38.3%)
Poor	146(29.9%)
Fair	155(31.8%)
Residential Status	
Rural	305(62.6%)
Urban	182(37.4%)

Table#2

Patterns of Medico legal Cases

Distribution of MLCs	Males		Females		Total	
	Frequency	%	Frequency	%	Frequency	%
Road Traffic Accident	34	6.98%	17	3.49%	51	10.47%
Stab Injury	42	8.62%	12	2.46%	54	11.08%
Poisoning	33	6.77%	43	8.82%	76	15.6%
Thermal Burn	4	0.82%	5	1.02%	9	1.84%
Sexual Assault	26	5.33%	37	7.6%	63	12.93%
Brought dead	26	5.33%	28	5.75%	54	11.08%
Fall from Hights	15	3.08%%	17	3.49%	32	6.57%
Near Drowning	4	0.82%	3	0.61%	7	1.43%
Near Hanging	24	4.92%	15	3.08%	39	8.00%
Electric Injuries	8	1.64%	3	0.61%	11	2.25%
Fire arm Injuries	34	6.98%	21	4.31%	55	11.3%
Alcohol intoxication	27	5.54%	9	1.85%	36	7.39%

Table#3

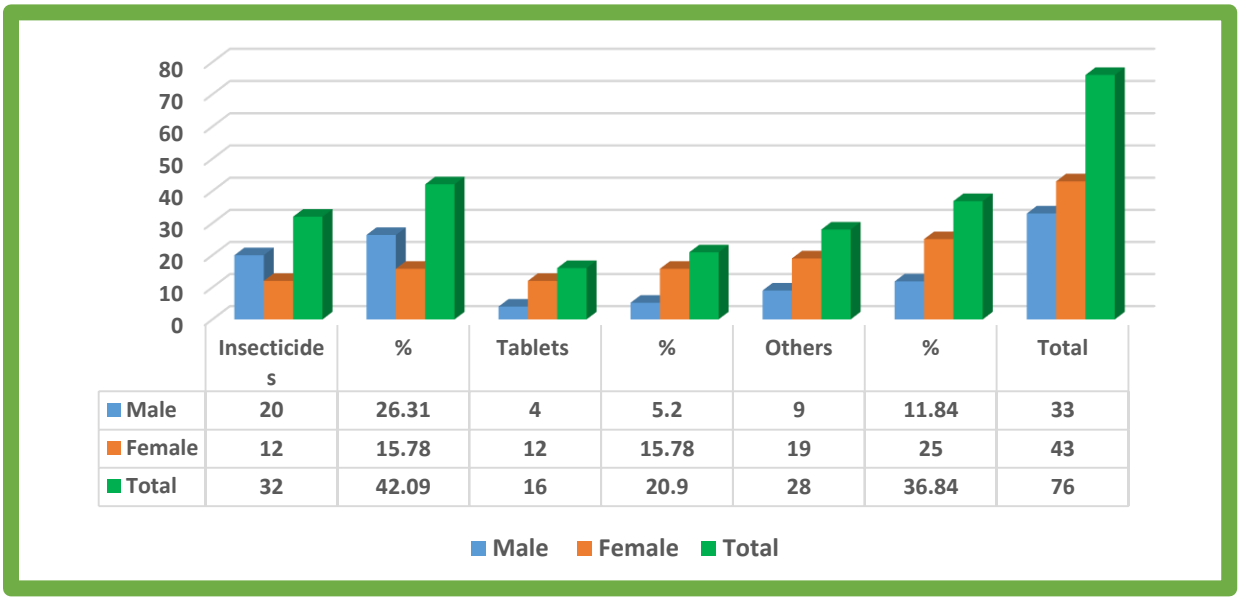
Association of various Types of Medico legal Cases with Socio-demographic Profile of Study Subjects

Types of Medico legal Cases	*f*(%) n=487	p-values		
		Gender	Marital Status	Educational Status
1. Self-inflicted Injuries				
Poisoning Near drowning Near hanging Alcohol intoxication	76 (15.6%) 8(1.6%) 38 (8.0%) 36(7.4%)	**0.02***	**0.00***	0.07
2. Occupational Accidental Injuries				
Road traffic accident Thermal Burn Electrical Burn	51(10.5%) 8(1.65%) 11(2.3%)	0.30	0.33	0.16
3. Other Medico legal Cases				
Stab Injury Sexual assault Fall from height Fire arm injuries	54(11.1%) 63(12.8%) 32(6.6%) 56(11.5%)	**0.001***	0.85	**0.00***
4. Outcome of Medico legal Cases				
Cured /discharged Referred Deaths	467(95.8%) 17(3.6%) 3(0.6%)	**0.03***	0.06	0.46

***significant associations**

Graph#3

Gender Distribution and Type of Poison taken by Victim



	Insecticides	%	Tablets	%	Others	%	Total
Male	20	26.31	4	5.2	9	11.84	33
Female	12	15.78	12	15.78	19	25	43
Total	32	42.09	16	20.9	28	36.84	76

p<0.05

Table#4
Hospital arrival Time after Exposure to Poison Among Male & Female Victims

GENDER	HOSPITAL ARRIVAL TIME		p-value
	≤ one hour	>one hour	
MALE	24(31.57%)	10(13.15%)	**0.001***
FEMALE	29(38.15%)	13(17.10%)	

***significant association**

DISCUSSION

It was record based cross sectional study conducted at emergency department of tertiary Liaquat University Hospital Hyderabad/Jamshoro during the period of 1st March to 31 May 2021 (3 months periods) where total of 639 medico legal cases were registered to get full information on 487 cases, the response rate was 76.21%. A retrospective record based study on412 medico-legal cases attending the casualty of Shyam Medical Hospital was conducted in Madhya Pradesh, India where the response rate was around 66.78 percent [31]. Another cross sectional study conducted by Meskere Y et al in emergency department of Tikur Anbesa Specialized Hospital on 437 cases in trauma patients attending the emergency department also showed the response rate of 68.21% percent [32].

Comparing socio-demographic profile of medicolegal cases, a hospital based observational study conducted by Mina SS et al at a tertiary care center in Delhi revealed a total of188 (79%) males and 50 (21%) females among a total of 238 cases (Male: Female ratio 1.58:1.0) [33]. Another research found agewise distribution of the subjects as 16 (6.72%) MLCs<1 year, 51 (21.42%) MLCs from 1 to 5 years, 44 (18.48%) from age group 6 to 10 years followed by 58 (24.36%) at age 11 to 15 years and remaining 69 (29%) of the subjects were in the age bracket of 16 to 18 years[34.] Contrasting to this, the study participants in the current study were classified into five age groups age groups. The majority 156 (32.0%) of age group belonged to 31-40 years (Male: Female ratio 1.13:1.0), 147 (30.2%) participants were from 19-30 years' age (Male: Female ratio 1.29:1.0), 92 (18.9%) victims were from 41-50 years of age group (Male:Female ratio 2.06:1.0), 83 (17%) responders were aged between 1-18 years (Male:Female

ratio 1.12:1.0) and 9 (1.9%) participants were from 50 years and above (Male:Female ratio1.25:1.0).

This is noteworthy that the Male: female ratio among medico legal cases remains the same in both studies.

In the present study there was a significant association of gender identified with multiple factors like self-inflected injuries ($p<0.02$) as well as the poison taken by victim ($p <0.05$). Tariq SA et al report in their study that marital status of victims as significantly associated to the type of the injury inflicted [34]. In the present study, 263 (54%) were un-married (Male:Female ratio 1.65:1.0), 146 (30%) were married (Male: Female ratio 1.56:1.0). Cumulatively the marital status of subjects was found significantly associated with type of self-inflicted injuries ($p <0.02$).

The present study showed that 62.6% of the study subjects belonged to rural areas and remaining as compared to 37.4% subjects who were residing in urban areas, the residential status of MLC cases having significantly association ($p<0.02$) with self-inflected injuries. However, the educational status of MLC cases, the 31.6% of the subjects were only primarily educated whereas only 13.8% subjects had received higher education (Male:Female ratio 1.48:1.0) i.e. $p = 0.00$). These findings are endorsed by a record based cross sectional study with similar objectives conducted by Brahmankar TR et al where 61.27% of the subjects belonged to urban areas as against 38.73% rural residents ($p=0.03$)[35].

Considering the patterns of medicolegal cases presenting at the study venue, the present study found out of total 487 cases 76 (15.6%) MLC cases of poisoning, 63 (12.9%) cases of Sexual assault,55(11.3%) firearm injuries,54 (11.1%) stab injuries and brought dead seen in 54 (11.1%) of the ML cases. Moreover, 51 (10.5%) MLCs of road traffic accidents, 39 (8 %) of total cases

were attempt to hanging which rescue by other persons, 36 (7.4%) cases of alcohol intoxication, 32 (6.6%) reported MLCs of fall from height, 11 (2.25%) Electric injuries, 9 (1.84%) thermal burn and only 7 (1.43%) firearm. A record based cross sectional study conducted at Karnatka, India on 2350 subjects,the stab injuries like blunt and hard objects injuries and sharp and pointed objects injuries were recorded in 27.2% subjects, road traffic accidents among 6.9%, falls among 6.8%, poisoning among 6.6%, domestic violence among 4.3% subjects, burns cases among 0.2% subjects; whereas only 0.6% subjects were brought dead[36]. An other retrospective study conducted in casualty department of Sri Siddhartha Medical College, Tumkur, Karnataka, India in which 41.6% of the reported medicolegal cases were road traffic accidents as compared to 8.09% cases of poisoning, 5.2% fall, 2.31% cases of electrocution, mechanical injuries 12.13%, 0.57% cases of burns. There were 21.96% cases of assault [37]. In the current study there were found significant association of gender with multiple determinants of MLCs like with self-inflected injuries (p= 0.01).

A study conducted in a tertiary care hospital Salem Tamil Nado, India in which among 150 MLCs of poisoning 61.33% were male and 38.66% female[37]as compared to present study in which among total76 cases of poisoning there were 55.26% females&44.74% were males. The association between gender & poison intake was statistically significant (p=0.02).Furthermore, out of total seventy six victims of poisoning, 69.75% victims (42.02% females & 57.08% males) were brought in hospital within hour of the incidence; this shows that the first reporting or time of arrival of the poisoning cases is short for males as compared to females. Moreover association of gender with time of arrival at casualty after exposure to poison was statistically significant (p=0.001).

A study conducted by Tariq SA et al in casualty department of tertiary care hospital attached with Punjab Medical college, Faisalabad, Punjab Pakistan recorded in all 22.22% victims of poisoning reporting for medico legal examination within twenty four hours [34].

The present study showed 56 medico legal cases belonged to firearm injuries of them 35 (62.52%) were males among whom majority got self inflicted firearm injuries.

CONCLUSION

The present study concluded that among all medico legal cases, the poisoning due to various substances was the most commonly reported MLCs at Medico Legal Department, Liaquat University Hospital Hyderabad/Jamshoro during the study period; this was followed by road traffic accidents, sexual assault& stab injuries, respectively. Furthermore, stab injuries, sexual assault, firearm injuries in term of incident were found significantly associated with lack of education. Further, the gender & marital status of the victims were identified as determinants of self inflicted injuries. The seriousness of the public health issue of medico legal cases needs to be addressed and planned with an organized approach for preventive strategies. Additionally, more elaborated research should be done to find out instances, causes and outcome of those MLC issues for concerned sections of society.

Declaration of No Conflict of Interest:

The research was not funded & has no conflict of interest among authors.

Ethical Approval:
Prior to the initiation of the study an ethical approval was obtained from Liaquat University Of Medical & Health Sciences Jamshoro. (NO.LUMHS/REC/-851).

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