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Original Article

Diurnal Variation in Suicide Timing by Age and Gender- A Post-mortem Based Study in New Delhi

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ABSTRACT

Background: In India, suicide is a national social issue and alone contributes more than 10% of the total suicides in the world. Aim of present study is to find out the diurnal variation in suicide timing in relation to age and gender of suicidal deaths. **Material and Method:** The present study was conducted in the department of Forensic Medicine and Toxicology, Lady Harding Medical College on a total of 50 cases of suicide brought to the mortuary for post-mortem examination. **Result:** Most of the victims (52%) were from the age group 21-40 years followed by 12 (24%) from the age group 41-60 years. Maximum incidence (24%) happened between early morning (4 am- 8 am) and late night (12 pm-4 am). In male victims, maximum cases of suicide deaths (28.9%) happened between 4 am to 8 am followed by 23.6% cases between 8 am to 12 pm and 12 am to 4 am. In female victims, maximum cases of suicide deaths (36.3%) happened between 12 pm to 8 pm followed by 27.2% cases between 8 pm to 12 am. **Conclusion:** In present study, maximum suicides occurred in early morning and late night (24%) followed by late morning (20%).

Keywords: Age, Diurnal variation, Gender, Suicide

INTRODUCTION

Suicide is a global public health problem and it accounts for almost 2% of the world's deaths accounting major cause of death in Western countries. In India, it is a national social issue and alone contributes > 10% of the total suicides in the world. India recorded increase of 1.4% suicide cases in year 2015 as compared to year 2014^[1]. Forty two percentage of world's population which is living in India and showing suicidal incidences is between 15-39 years age groups^[2]. Suicidal attempts are more common among females as compared to male

and majority of suicides occur among men and in younger age groups^[5].

Suicide occurrence among residents of Sacramento County, CA, during the period from 1925 to 1983 was examined as variation by time of day has never before been adequately examined. Data was abstracted from coroner's autopsy and investigative reports. In contrast to previous studies, data on time of death were available for a large percentage of cases. 4,190 suicide deaths were identified during the study period. Suicide occurrence varied substantially by time of day; for both

sexes and for ages under 65 years, the fewest suicide deaths occurred during the early morning hours, from 0401 to 0800. For recent years of the study, suicides occurred most frequently on Monday for both males and females and for most age groups. Variation by month followed no consistent pattern by gender, age, years of the study, or combinations of these factors. Contrary to popular belief, suicide occurrence did not vary by lunar phase^[4]. Incidents of self-harm at a medium secure unit in England over a four-year period showed a clear evening peak in frequency. This study also stressed that a diurnal variation in rate of self-harm supports work from other studies and merits further investigation^[5].

A study done by Preti *et al.* shows that clear diurnal variation in the distribution of suicides over time can be observed for both genders, with a peak in the late morning (08:00-11:00 h), and a subsequent decrease to a trough in the night hours. In this study, the observed trend was more marked among males; however, the distribution of suicides by time of day is clearly congruent by age between both genders^[6]. Aim of present study is to find out the diurnal variation in suicide timing in relation to

age and gender of suicidal deaths.

MATERIALS AND METHODS

The present study was conducted in the department of Forensic Medicine and Toxicology, Lady Harding Medical College on a total of 50 cases of suicide brought to the mortuary for post-mortem examination. Case history was recorded on a Performa as described after obtaining a formal consent from relatives in writing to provide the required information for the above-mentioned study.

RESULTS AND OBSERVATIONS

Out of 50 cases, 38 (76%) were male and 11 (22%) were female. Most of the victims 26 (52%) were from the age group 21-40 years followed by 12 (24%) from the age group 41-60 years (Table 1).

Table 2 shows that maximum incidence (24%) happened between early morning (4 am- 8 am) and late night (12 pm-4 am). Majority of cases (52%) belonged to age group of 21-40 years followed by the age group of 41-60 years. 14% cases belonged to age group 0-20 years followed by 10% cases in age group 61-80 years.

Table 1: Distribution of cases between gender and age group

Age group (Years)	Male	Female	Transgender	Total
0-20	3 (7.89%)	4 (36.3%)	0	7 (14%)
21-40	20 (52.6%)	5 (45.4%)	1	26 (52%)
41-60	10 (26.3%)	2 (18.1%)	0	12 (24%)
61-80	5 (13.1%)	0 (0.0%)	0	5 (10%)
Total	38	11	1	50 (100%)

Table 2: Relationship between time of Incidence and Age groups

Age groups (Years)	Time of Incidence					Total
	Early Morning (4AM-8AM)	Late Morning (8AM-12 PM)	Evening (12 PM-8 PM)	Night (8 PM-12 AM)	Late Night (12 PM-4AM)	
0-20	1	2	0	3	1	7 (14%)
21-40	8	4	1	6	7	26 (52%)
41-60	2	2	3	1	4	12 (24%)
61-80	1	2	0	0	2	5 (10%)
Total	12 (24%)	10 (20%)	6 (12%)	10 (20%)	12 (24%)	50 (100%)

Table 3: Relationship between time of Incidence and Gender groups

Time of Incidence	Gender			Total
	Male	Female	Transgender	
4 am – 8 am	11 (28.9%)	1 (9.09%)	0	12 (24%)
8 am – 12 pm	9 (23.6%)	1 (9.09%)	0	10 (20%)
12 pm – 8 pm	2 (5.26%)	4 (36.3%)	0	6 (12%)
8 pm – 12 am	7 (18.4%)	3 (27.2%)	0	10 (20%)
12 am – 4 am	9 (23.6%)	2 (18.1%)	1	12 (24%)
Total	38 (76%)	11 (22%)	1 (2%)	50 (100%)

Figure 1: Relationship between Gender groups and time of Incidence

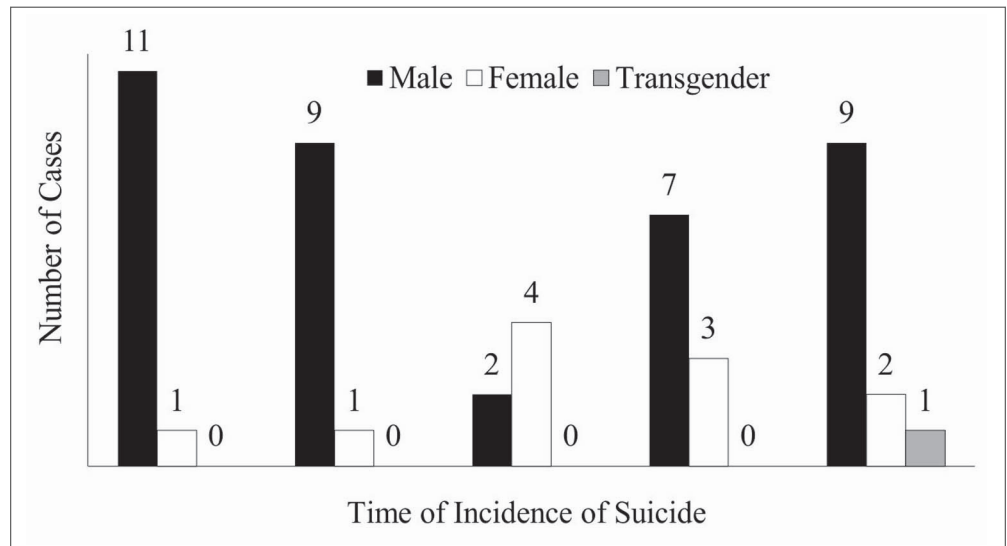


Table 3 and Figure 1 shows that maximum incidence of suicide (24%) occurred between 4 am to 8 am and 12 am to 4 am. In male victims, maximum cases of suicide deaths (28.9%) happened between 4 am to 8 am followed by 23.6% cases between 8 am to 12 pm and 12 am to 4 am. In female victims, maximum cases of suicide deaths (36.3%) happened between 12 pm to 8 pm followed by 27.2% cases between 8 pm to 12 am.

DISCUSSION

In present study, fifty victims who committed suicide during the period of November 2014 to march 2016 were included. To find out the nature and causes of suicide, psychological autopsy was used. Various international and international studies also used the similar approach previously. In present study, about half of the cases (52%)

belong to age group 21-40 years followed by 41-60 years (24%) age group. Similar results were observed in the studies done by various authors [7-9]. National Crime record Bureau also observed similar age group as prime age group for suicide [10]. The reason behind this may be suicidal behavior, not attending school or college due to peer pressure, exposure to premarital sex, physical abuse at home and experience of sexual abuse.

In the present study, males (76%) outnumbered the females (22%) in the commission of suicide. Similar results (male preponderance) were also reported in studies done by various authors [11-14]. Reasons for this may be that male have to take care of the family and he is quite stressed due to financial burden. Many times due to peer pressure and society pressure, men suffer a lot. On the other hand, some studies reported female

outnumbered than males in commission of suicide ^[10]. Reasons for this are socio-cultural practices as common practice of arranged marriages in India which may result in social and family pressure for the woman. Stress related to dowry demands may also result in suicide.

Suicide occurrence varied substantially by time of day and a clear diurnal variation in the distribution of suicides over time is observed in the present study, most that is 12 (24%) cases of suicide each were committed in early morning hours (4 AM to 8 AM) and late hours of night (12 PM to 4 AM). 10 cases (20%) committed suicide in the late morning hours that is 8 AM to 12 noon and 10 (20%) cases occurred during night that is 8 PM to 12 AM. Only a few persons that are 6 (12%) committed suicide in the evening that is 2 PM to 8 PM. In the present study maximum number of people had committed suicide during early morning and late night hours as this is the time when most of the people are sleeping so no one was awake to prevent the victim from completing the act. Similar results were observed in the study done by Chandra *et al.* ^[13]. However other researchers pointed to the contrary that the fewest suicide deaths occurred during the early morning hours, from 0401 to 0800 ^[4]. Other studies where victims committed suicide during early office hours ^[6] that is 21.9% ^[13] with a peak at 8-11hrs in the age groups 45-64 and 65+ ^[6] and 08:31-12.30 hours ^[15]. The reason of choosing early morning hours is as suicide victims prefers isolation and no

disturbance so that they are alone in their homes during this time to be able to complete the act as most of the people in the family proceed for work.

However, children and adolescents can generally be presumed to be at school during the morning, therefore their opportunity for self-harm is restricted to afternoon hours. The elderly, on the other hand, may find themselves alone in the morning, when family and friends spend more time away from home due to daily work activities.

Some researchers observed a clear evening peak (6PM -9 PM) in frequency ^[5] and 18.5% people committed suicide during this time ^[13]. Similarly in another study on suicide attempts frequency of attempts was more between the hours of 6:00-9:00 pm in males and 3:00-6:00 pm in females ^[16]. Younger people have a peak number of suicides in the late afternoon (16:00-19:00 h) ^[6] and risk of suicide is greatest during the late morning and early afternoon in another study ^[17] and it was concluded in another study that the number of suicides was also significantly higher between 12:31h and 20:30h than between 20.31h and 8.30h and age and gender did not significantly affect the seasonal and circadian rhythms in suicide ^[15].

This observation in diurnal variation in the present study in the incidence of suicide support work from other studies and merit further investigations. Socio-relational

Table 4: Comparative analysis of time incidence of suicide victims

Studies	Time incidence				
	Early morning	Late morning	Evening	Night	Late night
Maldonado and Kraus (1991)	↓	21.9%	-	-	-
Manfredini (1994)	-	-	↓	-	-
Altamura (1999)	-	↑	-	-	-
Preti and Miotto (2001)	-	↑	↑	-	-
Doganay (2003)	-	-	↑	-	-
Timothy <i>et al.</i> (2007)	-	-	↑	-	-
Chandra (2008)	3.1%	21%	40%	24.9%	11%
Present study (2016)	24%	20%	12%	20%	24%

factors are also likely to contribute to diurnal variation in suicide risk (Table 4). Increased adrenergic activity and lowered serotonergic activity in the afternoon might play a part in mood changes and diurnal variation in suicides [17].

CONCLUSION

Most of the victims (52%) were from the age group 21-40 years followed by 12 (24%) from the age group 41-60 years. Maximum incidence (24%) happened between early morning (4 am- 8 am) and late night (12 pm-4 am). In male victims, maximum cases of suicide deaths (28.9%) happened between 4 am to 8 am followed by 23.6% cases between 8 am to 12 pm and 12 am to 4 am. In female victims, maximum cases of suicide deaths (36.3%) happened between 12 pm to 8 pm followed by 27.2% cases between 8 pm to 12 am.

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