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Original Research Article

Cross Sectional Observational Assessment of The association of Menstrual Cycle with Suicide in Female of Reproductive Age Group

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Abstract

Aim: The aim of the present study was to assess the association of menstrual cycle with Suicide in Female of Reproductive Age Group.

Methods: This was a cross sectional observational study conducted in the dept. of Forensic Medicine and Toxicology for one year. Sample size was calculated as 100. Subjects were brought dead suicidal deaths within their reproductive age group (15 to 45 years).

Results: Most of the victims were between 18 to 30 years age group (58%) followed by 30 to 45 years (32%) and 15 to 18 years age group (9.9%). Prevalence of suicide was more than double among married women (64%) than unmarried ones (36%). Among various methods of commission of suicide, burn was the commonest one (55%) followed by poisoning (28%) and hanging (17%). Suicide was committed in different time of the day. Approximately 2/3rd of the victims committed suicide in the day time i.e. between 6am to 6 pm whereas it was little more than 1/3rd between 6 pm to 6 am. Considering histological appearance of endometrium, it has been observed that most of the women (60%) committed suicide in secretory phase of their cycle. Late secretory phase was more frequently chosen time than early secretory phase. Association between phase of menstrual cycle according to histology of endometrium and marital status of the women was significant statistically (p value < 0.001).Association between phase of menstrual cycle according to histology of endometrium and age group of the women was significant statistically (p value = 0.012).

Conclusion: The Present study established a positive relationship between suicidal attempt and secretory phase, particularly late secretory one. On the basis of Chi-square test, associations have also been noticed between phase of menstrual cycle with marital status and age of individual.

Keywords: Menstrual cycle; Proliferative phase; Secretary phase; Suicide

Introduction

According to the World Health Organization, nearly 800,000 people die from suicide every year (WHO, 2019). The prevalence of suicidal ideation among women around the world is 2.2% to 2.4% [1]. Moreover, over the past 20 years, the suicide rate has increased 4.12 times for women and 3.44 times for men. [2] Several studies have interpreted these findings to be associated with female-specific events such as being married, feeling hopeless [3] and depression. [4] In addition, subjective happiness and economic status have been shown to affect suicidal ideation among Korean women. [5]

Suicidal behavior may be influenced by the menstrual cycle, and there are many studies on the relationship between suicide and menstruation cycle phases based on cases of suicide attempts and suicidal deaths. These studies have shown mixed results. Some of them concluded that there was no relationship between phases of the menstrual cycle and suicidal behavior. Holding and Mink off (1973) [6] conducted a prospective study on 74 cases of non-suicidal self-injury who were admitted and treated at Regional Poisoning Treatment Centre. They had divided the menstrual cycle in the preovulatory and postovulatory phase for the study.

In their study, they failed to associate non-suicidal self-injury cases with a particular phase of the menstrual cycle. Birtchnell and Floyd (1974) [7] conducted a prospective study on 76 attempted suicide patient by self-poisoning or self-injury who were brought to them for psychiatric analysis. They did not find any relation between the menstrual cycle phase and attempted suicide cases.

Luggin et al. (1984) [8] conducted a prospective study on the relationship between the menstrual cycle phases and 121 psychiatric admission with premenstrual syndrome, suicidal attempts, and other psychotic and non-psychotic symptoms. For the study, they divided menstrual cycle into four equal duration phases. They found that psychiatric admissions are more during the menstrual period in comparison with the intermenstrual period. However, they did not find any characteristic difference between the attempted suicide group and other groups. Ekeberg et al. (1986) [9] conducted a prospective study on suicidal and non-suicidal attempts with various toxic agents among 156 women on the day of admission with regular menstruation to know the association with the menstrual cycle. Suicidal attempts were classified when the patient had taken the drug with full intention to die, and otherwise, intake was classified as non-suicidal attempts. They did not find any statistically significant relationship between suicidal attempt and the menstrual cycle.

The aim of the present study was to assess the association of menstrual cycle with Suicide in Female of Reproductive Age Group.

Materials and Methods

This was a cross sectional observational study conducted in the Department of Forensic Medicine and toxicology, Lord Buddha Koshi Medical College and Hospital Saharsa, Bihar, India. It was one year-long study. Sample size was calculated as 100. Subjects were brought dead suicidal deaths within their reproductive age group (15 to 45 years). Details about the victims regarding the age, address, marital status, date and time of suicidal attempt and menstrual history where available, were obtained from police requisition and inquest, and also from victim's available close associates. Consent was taken from the keens before collecting the tissue from the body. Unnatural deaths which were suicidal in manner were included whereas decomposed bodies, pathological samples of uterus were excluded. Tissue was collected and fixed in 10%formol saline for 24 hours. Then it was processed through the stages of dehydration, clearing, impregnation, block formation, sectioning by microtome and staining using haematoxylin and eosin stain. Stained slides were examined under microscope to identify the stage of menstrual cycle from histological appearance of endometrium. Endometrium in different stages of menstrual cycle. [10,11]

Assessment tools: Data was entered in Microsoft Excel Office 365. SPSS Version 21 was used for statistical analysis. All data (categorical) were expressed by frequency or percentage. Comparison study was done by Chi-square test. Any P value <0.05 was considered as statistically significant.

Results

Table 1: Percentage distribution study population according to different parameters

Age in years	Number	Percentage
15-18	10	10
18-30	58	58
30-45	32	32
Marital status		
Married	64	64
Unmarried	36	36
Method of suicide		
Burn	55	55
Hanging	17	17
Poisoning	28	28
Total	100	100
Time of attempt		
6amto6pm	65	65
6pmto6am	35	35
Phase of menstrual cycle		
Early secretory	18	18
Late secretory	42	42
Proliferative	15	15
Menstrual	25	25
Total	100	100

Most of the victims were between 18 to 30 years age group (58%) followed by 30 to 45 years (32%) and 15 to 18 years age group (9.9%). Prevalence of suicide was more than double among married women (64%) than unmarried ones (36%). Among various methods of commission of suicide, burn was the commonest one (55%) followed by poisoning (28%) and hanging (17%). Suicide was committed in different time of the day. Approximately 2/3rd of the victims committed suicide in the day time i.e. between 6am to 6 pm whereas it was little more than 1/3rd between 6 pm to 6 am. Considering histological appearance of endometrium, it has been observed that most of the women (60%) committed suicide in secretory phase of their cycle. Late secretory phase was more frequently chosen time than early secretory phase.

Table 2: Relation between Marital status and phase of menstrual cycle according to histology of endometrium

Phase of menstrual cycle	Married	Percentage	Unmarried	Percentage
Early secretory	14	21.875	04	11.11
Late secretory	36	56.25	06	16.66
Proliferative	04	6.25	11	30.55
Menstrual	10	15.625	15	41.66
Total	64	100	36	100

Among 64 married women, 78.125% committed suicide in secretory phase whereas among unmarried women prevalence of suicide in secretory and proliferative phase is more or less same (27.7.9% and 30.55% respectively). 41.66% of unmarried women committed suicide during their menstruation. Association between phase of menstrual cycle according to histology of endometrium and marital status of the women was significant statistically (p value < 0.001).

Table 3: Relation between Time of attempt and phase of menstrual cycle according to Histology of endometrium

Phase of menstrual cycle	6 am to 6 pm	6 pm to 6 am
Early secretory	12 (18.46)	6 (17.14)
Late secretory	28 (43.07)	14 (40)
Proliferative	07 (10.76)	08 (22.85)
Menstrual	18 (27.69)	7 (20)
Total	65 (100)	35 (100)

Almost 2/3rd of the subjects who committed suicide between 6am to 6 pm were in secretory phase of menstrual cycle, 10.76% were in menstrual phase and 22.85% were in proliferative phase. Out of 35 women who committed suicide between 6 pm and 6am, 57.14% were in secretory phase, 20% were menstruating and 22.85% were in proliferative phase. P value was 0.697 and was not statistically significant.

Table 4: Relation between Age of individual and phase of menstrual cycle according to Histology of endometrium

Age in years	Early secretory phase	Late secretory phase	Menstrual phase	Proliferative phase
15-18	4 (22.22)	2 (4.76)	2 (13.33)	2 (8)
18-30	12 (66.66)	23 (54.76)	8 (53.34)	15 (60)
30-45	2 (11.11)	17 (40.47)	5 (33.33)	08 (32)
Total	18 (100)	42 (100)	15 (100)	25 (100)

Those who committed suicide in secretory phase, most were in the age group of 18 to 30 years followed by 30 to 45 years and 15 to 18 years. Similar frequency was also observed among women who committed suicide during proliferative phase. Association between phase of menstrual cycle according to histology of endometrium and age group of the women was significant statistically (p value = 0.012).

Discussion

Suicide is nothing but taking away someone's own life. Though males both and females are victims of this unnatural form of death, gender variation in suicidal attempt and suicidal deaths exist. According to Jennifer Langhinrichsen [12] and Ahuja N, [13] females attempt suicide 3 times more than males while suicidal deaths are 3 times more common among males. In present scenario, suicidal attempts amongst young and middle-aged females (both married as well as unmarried) have alarmingly increased which may be due to many a factor like mental depression, familial or social disharmony or some sort of provocation either alone or in combination of more than one such factors. During a menstrual cycle hormonal changes occur both in proliferative phase (1st day

of menstruation to ovulation) and secretory phase (after ovulation till next menstruation starts). This hormonal change leads to mood swing, depression which may play a role in suicidal ideation. In a systematic review done by Wetzel RD, McClure JN, [14] suicidal death in secretory phase was more common in 5 studies whereas it was more common in proliferative phase in 6 studies.

All over the world, there is variation in the incidence of suicidal deaths amongst women, in reference to their relation with different age group (particularly between 15 to 45 years of age), marital status, religion, manner of commission of suicide, time of suicidal attempt and different phases of menstrual cycle. Factors responsible for such variation may be socioeconomic, psychological, educational, cultural and geographical differences. Most of the victims were between 18 to 30 years age group (58%) followed by 30 to 45 years (32%) and 15 to 18 years age group (9.9%). Prevalence of suicide was more than double among married women (64%) than unmarried ones (36%). Among various methods of commission of suicide, burn was the commonest one (55%) followed by poisoning (28%) and hanging (17%). Suicide was committed in different time of the day. Approximately 2/3rd of the victims committed suicide in the day time i.e. between 6am to 6 pm whereas it was little more than 1/3rd between 6 pm to 6 am. Considering histological appearance of endometrium, it has been observed that most of the women (60%) committed suicide in secretory phase of their cycle. Late secretory phase was more frequently chosen time than early secretory phase. Association between phase of menstrual cycle according to histology of endometrium and marital status of the women was significant statistically (p value < 0.001). The present observation is also consistent with the observation of Patel V in 2012, published in Lancet, where it was concluded that marriage is a risk factor for depression, which is of course the commonest psychological factor associated with suicide. [15] Observation of Randy A. Sansone et al in 2007 is also in concurrence with the observation of present study. [16] According to Caykoylu A et Al suicide completion and suicidal attempt are more common during proliferative or preovulatory phase which is not in concurrence with the observation of present study. [17] Premenstrual syndrome (PMS) which is characterised by anxiety, irritability, mood swing, insomnia and other psychological symptoms, starts during second half of menstrual cycle, i.e. secretory phase. It lasts till the onset of menstruation or 1 to 2 days after onset. Symptoms worsen as the secretory phase progresses. Sometimes symptoms become very severe which is known as Premenstrual dysphoric disorder (PMDD). When such symptoms combine with various social, cultural and socio-economic factors may aggravate suicidal ideation.

Almost 2/3rd of the subjects who committed suicide between 6am to 6 pm were in secretory phase of menstrual cycle, 10.76% were in menstrual phase and 22.85% were in proliferative phase. Out of 35 women who committed suicide between 6 pm and 6am, 57.14% were in secretory phase, 20% were menstruating and 22.85% were in proliferative phase. P value was 0.697 and was not statistically significant. Those who committed suicide in secretory phase, most were in the age group of 18 to 30 years followed by 30 to 45 years and 15 to 18 years. Similar frequency was also observed among women who committed suicide during proliferative phase. Association between phase of menstrual cycle according to histology of endometrium and age group of the women was significant statistically (p value = 0.012).On the basis of Chi-square test, associations have been found between phases of menstrual cycle with marital status of the women and age of the women (P value in both the cases were bellow 0.05) whereas no such association was found between phases of menstrual cycle with other parameters of the study.

Conclusion

The Present study established a positive relationship between suicidal attempt and secretory phase, particularly late secretory one. On the basis of Chi-square test, associations have also been noticed between phase of menstrual cycle with marital status and age of individual. All the relations established from this study, need further researches to find out any hormonal or other biological variations in young adult married women and in different period of day and night hours on the background of various phases of menstrual cycle which increase depression and mood swing, leading to increased incidence of suicidal attempt.

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