

Relationship Between Menstrual Cycle and Suicide Based on Histo-Pathological Study of Cadaver Uterus in a Tertiary Care Center, South India

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Abstract

Suicide is a global health concern. The risk of suicide is more in females compared to males. Reproductive health related factors are the major reason for this increasing risk. The aim of the study is to find out the relationship between menstruation and suicide and to find out if there is any relationship exists between any of the other phases of menstrual cycle and suicidal behaviour. Hospital based cross sectional study was conducted in the Department of Forensic Medicine, Government Medical College, Thrissur which is a tertiary care centre. The study was done for a period of one year, from August 2015 to July 2016. The final sample size attained i.e the uterus specimens of reproductive age group during the study period is 100. Thus 50 were taken as cases and the other 50 who died of any other cause other than suicide were taken as control. Majority of the study participants belongs to 20 years of age group among cases. Most of our study participants were married in our study, majority of the study participants were above poverty line, no specific history of motivation towards suicide was found in majority of the study participants followed by psychiatric problems and family problems. Hanging was the most common method used for suicide. Among the cases majority of the study participants were in the late proliferative phase. In our study majority of the study participants committed suicide in the early proliferative phase.

Keywords: Suicide, Menstrual cycle, Uterus, Endometrium.

Introduction

Around one million people die every year due to suicide. 10-20 million people attempt to suicide. Annually 50-120 million people gets impacted

profoundly by the suicide or the attempt made by a close friend or family member.¹ It was found that globally suicides constituted only 1.8% in 1998 where as it increased to 2.4% by the year 2020.² Suicidal ideation is the one which is described as contemplation

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about one's own death. Suicide attempt is defined as self injurious behavior with the implied or explicit aim to die.³ Many risk factors which coexist along with this behavior. They are panic disorder or post traumatic stress disorder, drug misuse and cluster B personality disorders. These risk factors which coexist will change or accelerate the suicidal ideation to suicidal attempt. In addition to this, women will have other factors like menstrual cycle, pregnancy, postpartum psychosis, abortion, marriage related stressors which will accelerate women's suicidal tendency.⁴⁻⁵ Though both males and females are victims of this unnatural form of death, gender variation exist in both suicidal deaths and suicidal attempt. According to some authors, attempt to suicide was found to be 3 times more among females compared to males but suicidal deaths are 3 times more common in males compared to females^{6,7}. In current scenario, the suicidal attempts in both young and middle aged females have increased alarmingly. The factors which are responsible for the suicide are familial or social disharmony or mental depression.

The hormonal changes in the Menstrual cycle occurs in both the Proliferative phase and Secretory phase. From the first day of menstruation to ovulation the phase is known as Proliferative Phase. Secretory phase starts from ovulation till the start of next menstruation. The hormonal changes which occurs during these phases can lead to mood swings, depression and also plays a major role in the suicidal ideation. Many systematic reviews done in these topics stated that more deaths are common in proliferative phase.⁸⁻¹¹ In contrast some studies stated that the deaths are more common in secretory phase. But still no authenticative data is available in this matter.

Materials and Methods

Study setting: Hospital based cross sectional study was conducted in the Department of Forensic Medicine, Government Medical College, Thrissur which is a tertiary care centre. The study was done for a period of one year, from August 2015 to July 2016.

Inclusion criteria:

- Women cadavers of reproductive age group 15-45 years which were determined cases of suicide

Exclusion criteria:

- Age <15 years and > 45years
- Decomposed body
- Hermaphrodites
- Death occurring after 24 hours of suicide attempt
- Bodies of pregnant women

Sample Size: Based on the Leenaars AA et al¹² study "Menstruation and suicide: A Histo-Pathological Study" $p_1=25\%$ and $p_2=4.5\%$. Substituting in the below formula,

$$= \frac{z\alpha + z\beta}{2} \sqrt{p_1q_1 + p_2q_2}$$

Z alpha(constant)=1.96, Z beta (constant)=0.84, $p=p_1+p_2/2$, $q=100-p$, $D=p_1-p_2$

With 80% power, 95% confidence interval victims were recruited for our study. The final sample size attained i.e the uterus specimens of reproductive age group during the study period is 100. Thus 50 were taken as cases and the other 50 who died of any other cause other than suicide were taken as control.

Data collection: Personal particulars like name, age, gender, marital status, occupation, socioeconomic status, motivating factors for the suicide, apparent cause of death were collected. After getting blanket consent from the relatives of the deceased, the uterus specimens of the women cadavers of reproductive age group 15-45 years coming for the autopsy in this tertiary care centre were examined at the time of autopsy. The fundus was caught hold and with left hand it was pulled upward. With the right hand the cervix was felt and the vagina was cut as low as possible with the knife. The ligaments were severed and the uterus intact with the ovaries and the tubes were freed. The size of the uterus was measured. Blade of scissors was introduced into the cervical canal and the anterior wall was cut up to a distance of 1cm distal to the fundus in order to open the uterus. Then the incisions were extended up to the horns. The findings were noted. Subsequently a bit of uterus measuring 5mm width which involves full thickness of the endometrium to serosa was taken from the fundal portion of the anterior wall was transferred for the histo-pathological examination in freshly prepared, 10% buffered formalin solution, in sealed bottles labeled with data, postmortem number, age,

police station and crime number. The 5 mm block of average uterus tissue is fixed in 20 times its volume of buffered neutral formalin for about 8 hours at room temperature. Complete fixation required 12-24 hours at room temperature. After fixation thin sections of endometrium were taken from the uterus and kept in capsules for processing.

Statistical analysis: After collecting the data, it was entered in MS excel Windows10. Statistical analysis was done in SPSS 23. Continuous data were expressed in terms of Mean \pm Standard deviation and Categorical variable were expressed in terms of numbers (percentages). P value of <0.05 is considered as significant.

Results

Majority of the study participants belongs to 20 years of age group 14(28%) followed by 26-30 years of age among cases 14(28%). In control group majority were in the 26-30 years of age 13(26%). Most of our study participants were married in our study 34(68%) followed by 43(86%). Majority of the study participants were above poverty line 31(62%) in cases and 44(88%) in control. (Table 1)

No specific history of motivation towards suicide was found in 16(32%) of the study participants followed by psychiatric problems 13(26%) and family problems 13(26%). (Figure 1) Hanging was the most common method used for suicide 27(54%) followed by burns 21(4%). (Figure 2)

Among the cases majority of the study participants were in the late proliferative phase 12(24%) followed by early secretory phase 11(22%). In control group most of the study participants were in early secretory phase 12(24%) and in early proliferative phase 10(20%). The difference between the groups were found to be not statistically significant. (Table 2)

In our study majority of the study participants committed suicide in the early proliferative phase 18 followed by late proliferative phase 12. Nearly 50% of the study participants committed suicide in this phase due to psychiatric problems 4(50%)

followed by family problems 2(25%). Psychiatric problems 3(25%) and the financial problems 3(25%) were the foremost cause of suicide in the late proliferative phase. In early secretory phase family problems were the foremost common cause 3(27.3%). No specific history was the most prevalent cause in the late secretory phase 5(45.5%) followed by family problems 3(27.3%). In menstrual phase, majority of the study participants who have committed suicide have no specific history 4(40%) followed by family problems as the second cause 3(30%).(Table 3)

Hanging was the most common method of choice for suicide in 7(87.5%) of the study participants in the early proliferative phase. In late proliferative phase around 10(83.3%) of the study participants opted for hanging followed by the poisoning 3(25%). Burns was the most common method of choice for suicide in early secretory phase 10(90.9%) followed by hanging. In late secretory phase burns was the most common method for suicide 6(66.7%). Hanging 7(70%) was the most common cause of suicide in the menstrual phase.(Table 4)

Table 1: Demographic characteristics of the study participants

| Variables | Cases | Controls |
|--|---------|----------|
| Age category | 14(28%) | 6(12%) |
| <=20 years | 9(18%) | 4(8%) |
| 21-25 years | 14(28%) | 13(26%) |
| 26-30 years | 2(4%) | 10(20%) |
| 31-35 years | 11(22%) | 7(14%) |
| 36-40 years | 0(0%) | 10(20%) |
| >40 years | | |
| Marital status Married | 34(68%) | 43(86%) |
| Unmarried | 16(32%) | 7(14%) |
| Socioeconomic status Above poverty line (APL) | 31(62%) | 44(88%) |
| Below poverty line (BPL) | 19(38%) | 6(12%) |

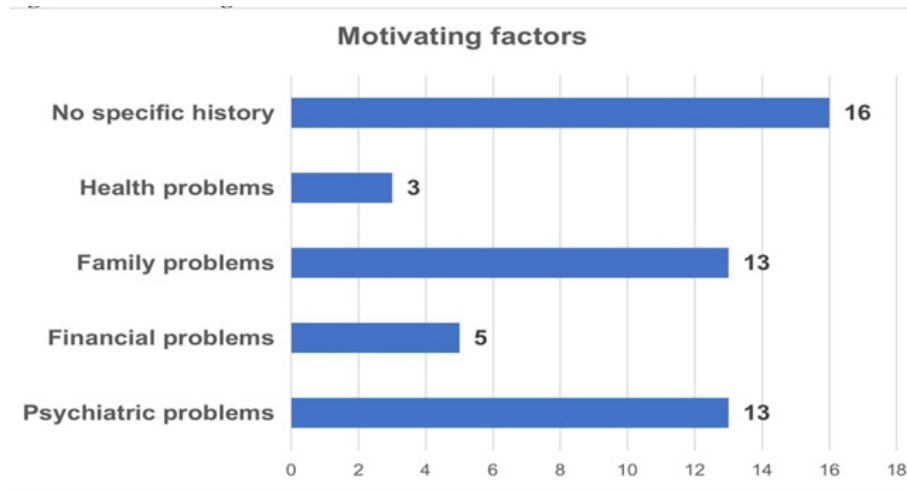


Figure 1: Motivating factors for suicide

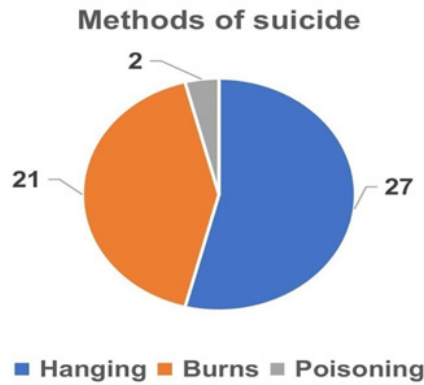


Figure 2: Methods of suicide

Table 2: Classification based on endometrial phase both in case and control group

| Endometrial phase | Cases | Controls |
|---------------------|---------|----------|
| Early proliferative | 8(16%) | 12(24%) |
| Late proliferative | 12(24%) | 10(20%) |
| Early secretory | 11(22%) | 12(24%) |
| Late secretory | 9(18%) | 7(14%) |
| Menstrual phase | 10(20%) | 9(18%) |

Table 3: Distribution of motivating factors for suicide in each endometrial phase

| Motivating factors | Endometrial phase | | | | |
|----------------------|---------------------------|--------------------------|-----------------------|----------------------|-----------------|
| | Early proliferative phase | Late proliferative phase | Early secretory Phase | Late secretory phase | Menstrual phase |
| Psychiatric problems | 4(50%) | 3(25%) | 2(18.2%) | 2(22.2%) | 2(20%) |
| Financial problems | 0(0%) | 3(25%) | 1(9.1%) | 1(11.1%) | 0(0%) |
| Family problems | 2(25%) | 2(16.7%) | 3(27.3%) | 3(27.3%) | 3(30%) |
| Health problems | 0(0%) | 2(16.7%) | 0(0%) | 0(0%) | 1(10%) |
| No specific history | 2(25%) | 2(16.7%) | 5(45.5%) | 5(45.5%) | 4(40%) |
| Total | 18 | 12 | 11 | 9 | 10 |

Table 4: Distribution of method of suicide in each endometrial phase

| Method | Endometrial phase | | | | |
|-----------|---------------------------|--------------------------|-----------------------|----------------------|-----------------|
| | Early proliferative phase | Late proliferative phase | Early secretory Phase | Late secretory phase | Menstrual phase |
| Hanging | 7(87.5%) | 10(83.3%) | 1(9.1%) | 2(22.2%) | 7(70%) |
| Poisoning | 0(0%) | 3(25%) | 0(0%) | 1(11.1%) | 1(10%) |
| Burns | 1(12.5%) | 2(16.7%) | 10(90.9%) | 6(66.7%) | 2(20%) |
| Total | 18 | 12 | 11 | 9 | 10 |

Discussion

Suicidal death is considered as an important indicator for the level of social, physical and mental health of an individual. Suicide death always pose a challenge for the Forensic expert as it is important to find the risk factors, risk factors and the pitfalls encountered by the victims. There is variation in incidence of suicidal deaths in different age group among women. This may be due to the marital status, manner of commission of suicide, time of the suicide attempt and different phases of menstrual cycle. Variation can occur due to multiple factors like psychological, socioeconomic, educational, cultural and geographical differences.

In our study around 60% of the women belonged to less than 30 years of age. This was similar to the Biswas et al¹³ study where majority of the women died of suicide 58.2% was less than 30 years. This was also concurrent with the results shown by AASRA¹⁴ where it was found according to a statistics that 139 women suicides in a day were of age less than 30 years. Similar findings were also seen in Patel V¹⁵ work where it was published that women of 15-29 years are the most vulnerable group of committing suicide.

Majority of the study participants in our study were married 77%. Similar results was also seen in Biswas et al¹³ study where 68.1% were married and the remaining 29(31.9%) were unmarried. This was in par with the observations made in AASRA¹⁴ where it was found among 130 women who committed suicide 69 were housewives. Patel V¹⁵ in his publication stated that marriage is found to be a psychological factor associated with suicide. Randy A Sansone et al¹⁶ also had similar results which is concurrent with our study.

In our study hanging is the most common method of suicide 27(54%) followed by 21(42%) Burns and poisoning 2(4%). Similar results was also seen in Balaram NA et al¹⁷ study and Dr surjith Sreenivas¹⁸ study. This was in contrast to study done by Biswas et al¹³ where 54.9% of women preferred burns followed by poisoning 27.5% and 6% hanging. In AASRA¹⁴ study majority consumed poison 33.1 % followed by hanging 31.4%, 10% burning and 4% drowning.

In our study majority of the study participants were in late proliferative phase 12(24%) followed by early secretory phase 11(22%). This was in contrast to Biswas et al¹³ study where majority were in early secretory phase 45.1% followed by proliferative phase 23.1%. Various studies were done to establish the relationship, some were in favour of proliferative phase and some in favour of secretory phase. No significant relation was found in our study between any of the phases of the menstrual cycle and the completed suicide. Similar results was also seen in Ekeberg O et al and Vanezis P.¹⁹⁻²⁰

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Conclusion

It is concluded in our study that there is no significant correlation between any phases of menstrual cycle and completed suicide. No specific cause was the predominant reason motivating to suicide in our study. Suicides were common in younger age group.

Recommendations: It is recommended to do further studies to find out the hormonal and the biological variations in the different age group and in different period like day and night and its association with the various phases of the menstrual cycle.

Ethical clearance: Taken from Institutional Ethics Committee, Govt. Medical College, Thrissur

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