ORIGINAL ARTICLE

Association between suicides among females and phase of uterine cycle during autopsy at a tertiary care centre in Bengaluru north

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Abstract

The study of "Association between suicides among females and phase of uterine cycle during autopsy" was carried out at a tertiary care centre over a period of 5 years with aim to identify the phase of uterine cycle in female suicides and to correlate the phase of uterine cycle with methods and reasons of suicide. A total of 222 cases fulfilled criteria, most vulnerable age group was 21-30 years (112 cases) and most vulnerable phase of uterine cycle was menstruation phase-88 cases (40%) followed by secretory phase-68 cases (31%). Most female suicides (79%) were due to hanging. Majority of suicidal cases during the 11–20-year (24 cases) and 21–30-year (50 cases) age groups were menstruating. In contrast, majority of suicidal cases during the 31–40-year (13 cases) and 41–50-year (8 cases) age groups were in secretory phase. Dysmenorrhoea (13 cases) and stomach pain (9 cases) were the reasons for the suicide exclusively in menstruating women, whereas depression (12 cases) was seen more in secretory phase and husband related conflicts were almost equally distributed in secretory (10 cases) and menstrual (9 cases) phases. Thus, this study indicates the time of applying the various strategies to curb the unhealthy emotional state of a woman in the form of health education, counseling and treatment of PMTS, a period between 4 days prior to start of menses to the end of menstruation; wherein a woman is vulnerable for sadness and impulsive acts.

Introduction

Worldwide, suicide is an important public health hazard. In India, suicide rate is approximately 8.0 per 1 lakh in females. While the population increase in the last decade was 25%, the suicide rate increased by 60%.[1] Significant risk factors for suicide are sudden impulsive decision of ending their life taken during height of emotion due to stress such as from financial difficulties, troubles with relationships, or from bullying[2] and a poor handling of emotions.[3] A number of psychological states increase the risk of suicide in people with low suicidal intention including: hopelessness, anxiousness, loss of pleasure in life and depression. The menstrual cycle also is a trigger for the onset of depressive disorders, including premenstrual dysphoric disorder (PMDD or PMTS), a disorder specific to the luteal phase of the menstrual cycle; and depression associated with the transition to menopause.[4] PMTS is an entity that causes considerable morbidity, and in about 3% of the women, it may disrupt the woman's life when severe symptoms like anger attacks, depression and suicidal thoughts recur.[5] Thus, these types of studies are known to give a comprehensive view of the root of the problem and help us draw various strategies to prevent suicide in females.

Materials and Methods

The present study was a descriptive study conducted to identify the phase of uterine cycle in female suicides and to correlate the phase of uterine cycle with methods and reasons of suicide. All cases with history of suicide in females subjected for medico-legal autopsy at Department of Forensic Medicine in a tertiary care centre, Bengaluru from December 2013 to December 2018.History was furnished by police in forms 146 (i) and (ii) and further proforma was filled by interviewing the relatives and friends of deceased, who accompanied the dead body. This proforma was used to collect the socio-demographic details of each suicide case (age, time of incidence, past medical history, personal history, LMP etc.) including various psycho-social variables associated with suicide (interpersonal relationship, various stressors, substance abuse, psychiatric illness, physical illness, chronic pain and disablement, suicide note, method used, and previous attempts, etc.). Post mortem examination of each case was carried out as per standard procedure, phases of menstrual cycle was determined grossly and from microscopic examination after staining with haematoxylin & eosin staining and causes of death were recorded (Figure 1,2 and 3). Further, comparative evaluation of data was analyzed. All cases with history of suicide in females brought for autopsy were included

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in this study. Cases where bodies were in advanced state of decomposition and where in uterus was removed (hysterectomy was done) were excluded from this study.

Sample Size Determination

Expected proportions of female suicides: p = 42.6 % (55 out of 130 cases).[1]

q = 100-p = 100-42.6 = 57.4

d = 20% of p = 8.52 (Relative precision: 20 %)

Required sample size: n = 4pq/d² = 135 cases.

Results

From prospective record analysis of female suicidal autopsy cases over a period of 5 years fulfilling inclusion criteria, 222 cases were eligible.112 cases were in the 21-30-year age group followed by 49 cases in 11-20, 35 cases in 31-40, 18 cases in 41-50 and 8 cases in >50-year age groups. As age advanced, females succumbed to suicides less often. Amongst 222 female suicides; at the time of their death, 88 cases (40%) were menstruating followed by 68 cases (31%) were in secretory phase, 43 cases (19%) were in proliferative phase, 14 cases (6%) had attained menopause and 9 cases (4%) were pregnant. 175 cases (79%) were due to hanging and 42 cases (19%) were due to poisoning, 4 cases (2%) and 1 case was due to drowning and burns respectively. In our study, there were no suicidal deaths due to other causes like fall from height, gunshot injuries, electrocution etc.

Amongst 175 hanging cases; at the time of their death, majority of cases (78 cases) were menstruating followed by 48 cases were in secretory phase, 34 cases were in proliferative phase, 8 cases had attained menopause and 7 cases were pregnant. In contrast, amongst 42 poisoning cases; at the time of their death, majority of cases (17 cases) were in secretory phase followed by 9 cases were menstruating, 9 cases were in proliferative phase, 5 cases had attained menopause and 2 cases were pregnant. Also, amongst 4 drowning cases; at the time of her death, 2 cases (31%) were in secretory phase followed by 1 case menstruating and 1 case attained menopause. 1 burn case was also in secretory phase.

Amongst 11-20-year age group (49 cases), at the time of their death, majority of cases (24 cases) were menstruating followed by 15 cases were in secretory phase, 8 cases were in proliferative phase and 2 cases were pregnant. Similarly, in 21-30-year age group (112 cases); at the time of their death, majority of cases (50 cases) were menstruating followed by 32 cases were in secretory phase, 23 cases were in proliferative phase and 7 cases were pregnant. In contrast, amongst 31-40-year age group (35 cases), at the time of their death, majority of cases (13 cases) were in secretory phase followed by 11 cases were menstruating. Even in 41-50-year age group (18 cases); at

the time of their death, majority of cases (8 cases) were in secretory phase followed by 3 cases were menstruating.

Most suicidal cases during menstruating phase of uterine cycle were seen in 21–30-year age group (50 cases), followed by 11-20 year (24 cases). Similarly, most cases during secretory phase of uterine cycle were seen in 21–30-year age group (32 cases), followed by 11-20 year (15 cases). In contrast, most suicidal cases during proliferative phase were seen in 21–30-year age group (23 cases), followed by 31-40 year (11 cases). Whereas, suicidal cases during pregnancy were confined to 21–30-year age group (7 cases), followed by 11-20 year (2 cases). And suicidal cases during menopause were more during 41–50-year age group (6 cases) followed by 3 cases each in 51-60 and >70-year age groups and 2 cases in 61-70 year. Various reasons for suicides and their association with different phases of uterine cycle are tabulated (Table 1). Out of 222 cases, no reason could be found in 58 cases. Alleged dowry (31 cases) was the commonest reason for suicide and was more prevalent in 21–30-year age group. Conflicts with husband (23 cases), depression (22 cases) and dysmenorrhoea (21 cases) were the other main reasons.

Table 1: Various reasons for suicides & its relation with phases of uterine cycle

| Phase Reason	Proliferative	Secretory	Menstruating	Pregnant	Menopause	Total
Abortion	2	-	1	-	-	3
Affair	-	-	2	-	-	2
Anger	-	1	2	1	-	4
Debt/loss	1	1	1	-	-	3
Depression	1	12	6	1	2	22
Dowry	9	8	11	3	-	31
Dysmenorrhoea	-	-	13	-	-	13
Exams fail	1	-	2	-	-	3
Harass/Torture	1	-	4	-	-	5
Headache	-	2	1	1	-	4
Husband related	1	10	9	2	1	23
Illness/injury	1	7	5	-	2	15
Love/failure	-	5	2	-	-	7
Mental illness	4	4	2	1	-	11
Not known	20	14	18	-	6	58
Parenting adjustment	1	3	-	-	-	4
Stomach pain	-	-	9	-	2	11
Unemployed/ poverty	1	1	-	-	1	3
Total	43	68	88	9	14	222
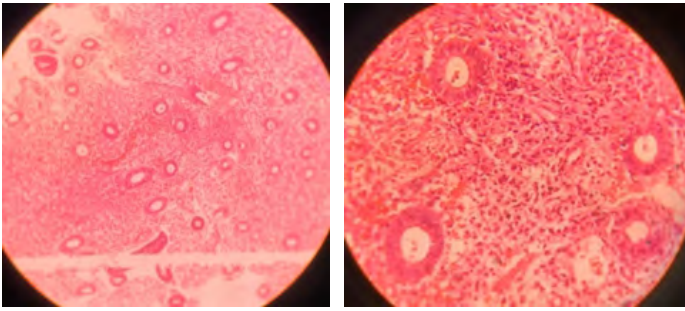
Figure 1: Proliferative Phase. Glands are straight & tubular, having columnar lining with basal nuclei. New sprouting vessels; Stroma is dense & compact
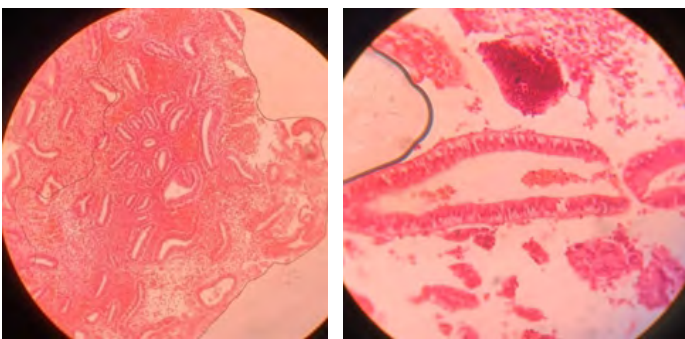

Figure 2: Secretory Phase. Luminal secretions & ragged luminal border of cells, Vacuole at surface of cell; Stroma large, edematous
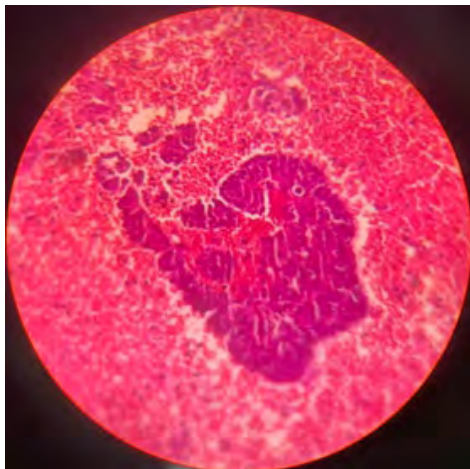

Figure 3: Menstruating Phase. Broken endometrial glands with large areas of hemorrhage (menstrual blood) in uterine cavity

Discussion

The vulnerable age groups for completed suicides were those in 21-30 years (50 %) followed by age group of 11-20 years (22 %). The reason being that it is the transitory period for females from adolescence to adulthood and also from parent's house to husband's house. Hence prone for lots of pressure arising out of managing family and work and succumbed mainly due to conflicts related to adjustment with her spouse or spouse's family at her new residence.

Similar observations were made in study done by Chavan et al., wherein majority (59.4%) of suicide victims were in age group of 20 to 29 years, followed by age group 30 to 39 years (14.8%).[1] Tanna et al. found that 85% of suicide cases were in 15-44 yrs age group.[6] Menstruating phase (40 % of suicides) was the most vulnerable phase of uterine cycle in our study of completed suicides wherein women developed suicidal tendencies owing to the mood changes that may happen during this period in reproductive age women. Secretory phase (31 % of suicides) was the second most vulnerable phase of uterine cycle in women committed suicides in our study owing to the depressive disorder of PMTS.

Hanging (79%) was the most common method of suicide in all phases of uterine cycle; accounting for 78 cases in menstruating phase, 48 cases in secretory phase and 34 cases in proliferative phase. Hanging was the most preferred method of suicide owing to easy availability of the materials in house required for hanging, thus resorting to faster death. Media including television and movies play a vital role in inducing such ideations in these vulnerable groups. Findings are consistent with study where out of 33 hanging cases 18 were in menstruation phase (54.54%).[7] Hanging was followed by poisoning (20%); both together accounting for 99% of cases. Hanging (72.2%) was also the most frequent method in studies by Chavan et al. and Soole et al.[1, 8] In contrast, the primary method of suicide was poisoning, used by 40.50% of deceased, involved in 45.53% of cases.[9] Women preferred jumping from height (p<0.001) in a study in Athens.[10]

Majority of menstruating women as well as women in secretory phase chose hanging as the method of suicide. But majority of women who chose poisoning as the method of suicide were in secretory phase. This may emphasize the extent of impulse during suicide in various phases of uterine cycle. So, although menstruating women and women in secretory phase looked for faster methods of suicide; luteal (secretory) phase women also resorted for other methods of suicides like poisoning which caused slow deaths owing to less severity of suicidal impulse in them compared to menstruating women. Majority of suicidal cases during the 11–20-year (24 cases) and 21–30-year (50 cases) age groups were menstruating. In contrast, majority of suicidal cases during the 31–40-year (13 cases) and 41–50-year (8 cases) age groups were in secretory phase. So, in early adulthood, females had more impulse of suicidal tendency during menstruating phase of PMTS whereas as the age advanced, females in their late reproductive periods had more suicidal tendencies during secretory phase of PMTS. Similarly, in a study, a high prevalence of PMTS and PMDD was observed in premenopausal women. The prevalence was higher in women older than 35 years.[5]

As most suicidal cases were in the 21–30-year age group (112 cases out of 222), the cases during any phase of menstrual cycle i.e., either proliferative, secretory or menstruating phase were more commonly seen in the 21–30-year age group. It is for the same reason that majority of suicidal cases during pregnancy were also found in the 21–30-year age group. Also, in another study, the prevalence of PMS (pre-menstrual syndrome) was higher in non-married women, in women aged 35-44 years.[11]

In our study, deceased women were found exclusively in menstruating phase when dysmenorrhoea (13 cases) and stomach pain (9 cases) were the reasons for their suicide; probably owing to less tolerance of pain during PMTS. They were found more in secretory phase than menstruating phase when the reasons for their suicides were depression (12 cases) or other reasons like chronic illness (7 cases), love failure (5 cases), parenting adjustment (3 cases). And they were distributed almost equally both in secretory (10 cases) and menstrual (9 cases) phases in husband related conflicts. In a study, both PMS and PMDD were strongly associated with poor physical health and psychological distress. Socio-cultural factors seem to determine the prevalence, perception and handling of PMS.[10] Whereas more serious reasons like dowry and cases of unknown reasons were distributed in all the phases of uterine cycle. In a study it was found that reasons for committing suicide were mainly due to marital discord (36.36%) followed by health issues (15.15%).[7]

Conclusion

In our study, suicides cases were mostly seen in women menstruating and in secretory (luteal) phase indicating these phases of uterine (menstrual) cycle as the most vulnerable phase in reproductive women for mood alterations leading to suicides. This could be due to an entity called pre-menstrual syndrome, a period between 4 days prior to start of menses to the end of menstruation; wherein a woman is vulnerable for sadness and impulsive acts. This indicates the time of applying the various strategies to curb the unhealthy emotional state of a woman in the form of health education, counseling and treatment of PMTS. Other psycho-social variables associated/affecting the mental status of a woman can also be curbed during that phase. Efforts to increase social connection in depressed and isolated women of reproductive age group especially in the period of PMTS or PMDD are recommended. Vulnerability of women during this period for anger, irritability and mood swings to be known and understood by the family especially husbands so that they keep their calm and help in easing out the stress of daily activities of his life partner. Suicide prevention efforts should include treating mental disorders such as depression including this PMTS or PMDD

and also improving economic conditions. The media, which includes the Internet, may help prevent suicide by providing a social group of women for those who are in need during this period of pre-menstrual tension syndrome.

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