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Original Research Article

EXPLORING BIOLOGICAL CONTRIBUTORS TO DEPRESSION IN POSTMENOPAUSAL WOMEN IN CENTRAL KERALA

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Abstract

Background: Postmenopausal women are susceptible to depression due to various factors. Identifying these risk factors is crucial for recognizing individuals at a higher risk of developing depression during this life stage. Therefore, this study aimed to explore the biological contributors to depression in postmenopausal women. **Materials and Methods:** The study involved 50 cases and 50 age-matched controls. The diagnosis of depression in postmenopausal women was based on the International Classification of Diseases-10 Diagnostic Criteria for Research (ICD 10 DCR). Sociodemographic, medical, and gynecological data were collected using a specialized proforma. Menopausal symptoms were assessed with the Menopausal Rating Scale. Statistical analysis, including chi-square tests and odds ratios, compared data between cases and controls. **Result:** The study found significant associations between postmenopausal depression and the severity of menopausal symptoms, history of premenstrual symptoms, past depression, and medical disorders. **Conclusion:** This study brought out that several biological factors make postmenopausal women vulnerable to depression. These factors can serve as markers for identifying individuals at higher risk. Early recognition of these risk factors enables timely intervention and support, ultimately leading to improved outcomes for affected individuals.

INTRODUCTION

Menopause is a biological transition from reproductive to non-reproductive life, characterized by the cessation of menstruation for 12 consecutive months.[1] While the majority of women transition through menopause without experiencing psychiatric issues, approximately 20% may experience depression at some point. This phase brings about various physiological changes resulting from the decline in ovarian function and the natural aging process. Menopausal symptoms, including vasomotor, somatic, psychological, and sexual disturbances, can significantly impact the quality of life for postmenopausal women.[2] Depression, anger, anxiety, and mood swings are commonly observed psychological symptoms in postmenopausal women. In addition to this, menopause often coincides with important life events, such as changes in the family structure, such as children leaving home, and changes in women's roles, responsibilities, and relationships further adding to the distress.[3] Depression can have detrimental effects on both mental and physical health, leading to functional impairments and a decline in social functioning.[4] Unfortunately, many cases of postmenopausal depression go undiagnosed due to various factors. Therefore, it is crucial to identify the contributors associated with depression in postmenopausal women to recognize those who are vulnerable and enable early diagnosis and treatment. However, in India, research is scarce on this subject, and specifically, no case-control studies have been conducted.

Addressing this research gap is essential for a better understanding of the factors contributing to depression in postmenopausal women. This will ultimately improve the overall well-being and mental health outcomes of postmenopausal women.

MATERIALS AND METHODS

The study was initiated in a tertiary care hospital in central Kerala from February 2021 to 2022 August

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after approval from the Institutional Ethics Committee. The study sample included 50 postmenopausal women with depression and 50 normal postmenopausal women in the control group. The purposive sampling method was used in this study. Postmenopausal women who met the International Classification of Diseases 10 Diagnostic Criteria for Research (ICD-10 DCR) for depressive episode, under the age of 65 were included as cases with their consent. The cases were taken from the psychiatric outpatient department. After the exclusion of psychiatric disorders by using the MINI plus questionnaire, 50 age-matched postmenopausal women were included in the control group from the general population. A semi-structured proforma was prepared for this study, which included socio-demographic details, and medical and gynecological history. Each subject was assessed for menopausal symptoms using the Menopause Rating Scale. Data were entered into Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (IBM SPSS), version 25. Sociodemographic variables, menopausal symptom scores, and other variables were analyzed as proportions or percentages for categorical variables and as either mean ± SD or median (IQR) for numerical variables. The chi-square test was used to analyze associations between study variables and groups. Differences in mean variables between groups were analyzed using the unpaired t-test for parametric variables and the Mann-Whitney U test for nonparametric variables. p-value <0.05 was considered statistically significant.

RESULTS

Sociodemographic details among groups are described in [Table 1]. The mean age of cases was 53.58 ± 4.58 and 54.56 ± 3.82 years in the control group. There was no statistical difference between the two groups in educational status, occupational status, marital status, religion, and socioeconomic status. No statistical significance was obtained for the presence of family history of depression (P=0.010) [Table 4] and duration of the reproductive period (P = 0.682) [Table 2]. Most of the cases had comorbid medical disorders (P = 0.015, Odds ratio=2.73) [Table 3]. History of premenstrual symptoms was present in 30% of cases and 6% of controls (P = 0.002, Odds ratio = 6.714). The mean score of MRS [Table 2] of cases was 27.12 ± 5.374 and of controls was 7.90 ± 3.72(P= <0.001).

Table 1: Comparison of the sociodemographic variables

Variables	Cases (n=50) Mean ± SD	Controls (n=50) Mean ± SD	t/ χ2	P value
Age (years)	53.58±4.58	54.56±3.82	1.161	0.248
Education				
Primary High school Above 10th	6(12%) 25(50%) 19 (38%)	4 (8%) 27(54%) 19 (38%)	0.477	0.788
Occupational status				
Employed Unemployed	13(26%) 37 (74%)	12 (24%) 38 (76%)	0.053	0.817
Marital status				
Married Unmarried Widowed	44 (88%) 1 (2%) 5 (10%)	43 (86%) 2 (4%) 5 (10%)	0.345	0.842
Socioeconomic status				
Upper middle class Lower middle class Lower class	11 (22%) 37(74%) 2(4%)	15 (30%) 35(70%) 0	2.671	0.263

Table 2: Association with menstruation-related factors

Variables		Cases (n=50) Mean ± SD	Controls (n=50) Mean ± SD	χ2 Value	P Value
Premenstrual symptoms	Present Absent	15 (30%) 35(70%)	3 (6%) 47 (94%)	9.756	0.002
MRS score		27.12 ± 5.37	7.90±3.72	20.801	0.000
Duration of the reproductive period		35.44± 3.61	35.72±3.201	0.410	0.682

Table 3: Association with medical disorders

Medical disorders	Groups				χ2 Value	p Value
	Case		Control			
	n=50	%	n=50	%		
Present Absent	35 15	70.0 30.0	23 27	46.0 54.0	5.911	0.015

Table 4: Association with the past history of depression and family history of depression

Variables		Cases (n=50) Mean ± SD	Controls (n=50) Mean ± SD	χ2 Value	P Value
Past history of depression	Present Absent	4 (8%) 46(92%)	0.00 50 (100%)	4.167	0.041

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Family history of depression	Present Absent	8(16%) 42 (84%)	3 (6%) 47 (94%)	2.554	0.110

DISCUSSION

The present case-control study aimed to explore the biological contributors to depression in postmenopausal women. The study included a sample of 50 postmenopausal women with depression (cases) and 50 postmenopausal women without depression (controls), matched for age.

The postmenopausal period has been recognized as a critical period associated with an increased vulnerability to depression and psychiatric disorders.[5] Findings from the Study of Women's Health across the Nation Mental Health Study (SWAN MHS) reveal a substantial three-fold higher risk of developing major depression during the late perimenopausal or postmenopausal phase compared to the pre- or early perimenopausal phase.[6] Hormonal changes during the menopausal transition, including decreased estrogen levels, have been implicated as risk factors for the development of depressive symptoms.[7]

Multiple studies have demonstrated the impact of hormonal changes during menopause on the development of various physical, sexual, vasomotor, and psychological symptoms.[8] Hot flashes have been associated with fluctuations in estradiol and follicle-stimulating hormone (FSH) levels, and the reduction of estrogen levels can lead to decreased serotonin levels and an upregulation of the 5-HT2A receptor in the hypothalamus, resulting in hot flashes.[9] The relationship between menopausal symptoms and depressive symptoms has been consistently reported in previous research.[10] These symptoms can be highly bothersome and represent a major risk factor for sleep disturbances, anxiety, and depressive symptoms.[11] In the current study, the severity of menopausal symptoms was assessed using the Menopausal Rating Scale (MRS). The findings revealed a significantly higher mean MRS score among women with depression (cases: 27.2 ± 5.37) compared to those without depression (controls: 7.90 ± 3.71). These results are in line with previous research that has consistently linked menopausal symptoms to depression in postmenopausal women.[10,12,13] This study also revealed a significant association between a history of premenstrual symptoms and postmenopausal depression, with a higher prevalence of premenstrual symptoms observed among women with depression (cases) compared to those without depression (controls) which is consistent with a previous study conducted by Ahuja et al.[14] This association underscores the importance of understanding reproductive hormone sensitivity as a potential contributor to depression.[15]

A longer reproductive period, characterized by a later age at menopause and extended exposure to endogenous estrogen, was seen to be associated with a decreased risk of depression in later life as per previous studies.[16,17] However, in the present study, the duration of the reproductive period did not significantly differ between cases and controls, hence could not establish any significant effect. It is important to acknowledge limitations such as sample size, recall bias, and the inclusion of women who underwent surgical menopause, which could have influenced our results. In the present study, hormone replacement therapy (HRT) was not used by any of the participants, which limited the examination of its relationship with postmenopausal depression.

The present study revealed a significant association between prior depression and postmenopausal depression, as cases had a higher prevalence of past depression compared to controls (P=0.041, Odds ratio=2.087). This finding is consistent with earlier research that has consistently established a link between a past history of depression and the increased risk of depression during the postmenopausal period.[15,18,19] In contrast, while some studies have suggested that a family history of depression may be a predictor of major depression in the postmenopausal period, the present study did not find a significant association in this regard. It is important to note that the methodology used in the present study only accounted for diagnosed relatives, potentially underestimating the true prevalence of family history.[20]

This study also revealed a significant association between the presence of chronic medical diseases and postmenopausal depression. Among the cases, there was a higher prevalence of medical disorders compared to the controls. This finding adds to the existing body of research that those with chronic medical conditions are at higher risk for depression.[21,22] Chronic illnesses not only impact physical health but also have a profound effect on individuals' psychosocial well-being.

This case-control study provides valuable insights into the biological contributors to depression in postmenopausal women. The findings highlight the importance of considering menopausal symptoms, premenstrual symptoms, past history of depression, the presence of medical disorders as potential indicators for identifying women at risk of postmenopausal depression.

However, several limitations need to be considered. The smaller sample size and lack of representation from the broader community may limit the generalizability of the findings, highlighting the need for larger-scale studies to confirm these results. Recall bias is also a potential limitation, as participants may face challenges accurately recalling past experiences or symptoms. Therefore, future research utilizing larger sample sizes and more diverse populations, along with a prospective study design, is warranted to further investigate these risk factors and enhance our understanding of postmenopausal depression.

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CONCLUSION

This case-control study investigated the biological contributors to depression in postmenopausal women. The study brought out that several biological factors make postmenopausal women vulnerable to depression. Specifically, the severity of menopausal symptoms, history of premenstrual symptoms, past history of depression, and presence of medical disorders were identified as significant risk factors for postmenopausal depression.

These findings are consistent with previous research, supporting the validity and generalizability of the study's results. The identified risk factors can serve as valuable indicators for identifying postmenopausal women who are at a higher risk of developing depression.

Further research is warranted to delve deeper into the factors that did not show significant associations in this study and to explore additional variables that may contribute to the development of postmenopausal depression.

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