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Plasma-based microRNA biomarkers for depression in Romanian patients: preliminary findings

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Introduction: Depressive disorders are one of the most disabling mental illnesses with a significant impact on society. In Romania the mean annual total costs per depression patient are EUR 5553, a much higher figure than the mean annual total costs per patient ranged worldwide.
Even though their roles in depression have not been elucidated, a plethora of potential biomarkers in multiple body fluids for the early diagnosis of depression has been suggested. Blood circulating microRNAs (miRNAs) are potential biomarkers for several human diseases, including psychiatric disorders. Different studies have shown that micro RNAs are involved in a series of pathophysiological processes and could be useful markers for diagnosis and prognosis of depression.
Objectives: This preliminary case-control study was designed to identify putative blood circulating miRNAs associated with the diagnosis of depression in Romanian patients.
Methods: In this study, 20 patients with depression and 24 non-depressed controls were enrolled. All the individuals have been interviewed and screened using the following scales: the Hamilton Anxiety Scale (HAM-A), the Becks Depression Inventory (BDI) and the Perceived Stress Scale (PSS). The expression of 179 miRNAs in plasma have been evaluated by qRT- PCR. The difference in the expression of miRNAs between the two groups, as well as the correlations with the scores of the scales have been analyzed.
Results: A panel of 28 miRNAs was identified as differentially expressed between patients and controls. Only miRNAs showing a -2>FC>2.0 and p<0.05 have been considered significant. Seven miRNAs (miR-143-3p, miR-331-3p, let-7f-5, miR-502-3p, miR-145-5p, miR-7-1-3p, miR- 29a-3p) were found up-regulated in the depression group, while 21 miRNAs (miR-885-5p, miR-425-3p, miR-32-5p, miR-23b-3p, miR-590-5p, miR-30a-5p, miR-132-3p, miR-376a-3p, miR-223-5p, miR-133b, miR-142-5p, miR-92b-3p, miR-140-3p, miR-16-2-3p, miR-28-3p, miR-27a-3p, miR-15b-3p, miR-106b-3p, miR-877-5p, miR-30e-3p, miR-140-5p) showed a down-regulation in the group of patients compared to the controls. Some of the significant correlations between miRNA expression and the scale scores are reported: a positive correlation between let-7f-5 and miR-7-1-3p with the BDI score (p=0.003 r=0.526, and p=0.008 r=0.477, respectively) and a negative correlation between miR-425-3p with BDI (p=0.002 r=-0.502) were found.
Conclusions: The results reported in this communication represent preliminary findings. Due to the nature and heterogeneity of depression, the number of patients and controls in the two cohorts will be enlarged to correlate these miRNAs with other patient features.

Disclosure of Interest: None Declared

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Mitochondrial DNA Copy Number Changes in Mood Disorders during the Menopausal Transition

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Introduction: A heightened susceptibility to mood disorders among women at specific junctures throughout their reproductive lifetime has been reported. Previous studies have suggested that the probability of developing Major Depressive Disorder (MDD) during the menopausal transition is amplified from 2 to 4 times when contrasted with both premenopausal and postmenopausal periods and also increased mood symptom severity in the menopausal transition in bipolar disorder (BD) has been cited (Chen *et al.* Arch Womens Ment Health 2017; 20 463-8). A considerable body of evidence suggests that mitochondrial dysfunction plays a crucial role in the pathophysiology of various psychiatric disorders, including MDD and BD. Researchers have proposed that the mitochondrial DNA copy number (mtDNAcn) may serve as an essential marker of mitochondrial health, which is the ratio of mitochondrial and nuclear DNA (Malik *et al*. Mitochondrion 2013; 13 481-92).
Objectives: In this review, we aimed to compile and present existing data regarding mtDNAcn alterations in women during the menopausal transition by comparing the mtDNAcn numbers of the women in premenopausal, perimenopausal and postmenopausal periods thereby establishing a foundation for future research on the origins of these conditions.
Methods: A literature search was conducted on the electronic databases PubMed, Cochrane Library, Medline (OVID), Scopus, Web of Science and CINAHL to identify the relevant studies published until 14 October 2024. The search was performed using the following keywords (Menopause OR Premenopause OR Pre-Menopause OR Premenopaus* OR Perimenopause OR Postmenopause OR Post-Menopause OR Postmenopaus*) AND (mitochondrial DNA copy number OR mtDNA copy number) and limited to English language.
Results: According to the search results, 66 publications were reached in total. After detecting and removing duplicate publications, there were 21 publications left. After screening, any of the studies met inclusion criteria for the systematic review, because most of them were conducted in different patient groups and healthy controls in the menopausal transition periods, but the main findings of these studies can be summarized as; mtDNAcn varies between the patients groups and healthy controls in the menopausal transition periods with the conflicting results. Some of the studies found higher mtDNAcn in patient groups such as breast cancer and pelvic organ prolapsus, whereas some of them found lower mtDNAcn numbers in patient groups such as osteopenia and osteoporosis.
Conclusions: Considering above findings, there is mtDNAcn alterations in women during the menopausal transition. These findings may highlight the need for future studies to elucidate the link with mtDNAcn and mood disorders in the menopausal transition period by comparing the women in different menopausal periods.

Disclosure of Interest: None Declared

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