

Brief Review

An Overview of Short- and Long-Term Adverse Outcomes and Complications of Perinatal Depression on Mother and Offspring

Wafaa Mohamed Korany¹, Diaa Marzouk Abd el-Hamid^{1,2}, Mohamed Farouk Allam^{1,2,*}

¹Department of Family Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt

²Department of Community, Environmental and Occupational Medicine, Faculty of Medicine, Ain Shams University, Cairo, Egypt

*Correspondence: Mohamed Farouk Allam (farouk.allam@med.asu.edu.eg)

Abstract Antenatal and postpartum major depressive episode (MDE) according to Diagnostic and Statistical Manual of Mental Disorders 5th Edition (DSM-V) is defined as either daily sustained sad mood or lack of enjoyment or desire for a minimum two weeks plus four associated manifestations (only three if the two major symptoms are present) that start throughout pregnancy or during the first 4 weeks postpartum respectively: 1) Unintentional notable slimming up or down; 2) Sleepiness or sleeplessness; 3) Tiredness sensation; 4) Guilty or futility sensation; 5) Declined concentration capacity; 6) Frequent suicidal thoughts; 7) Psychomotor excitation or delay. Perinatal depression carries vital and adverse consequences on mother's psychosocial aspects of life, pregnancy and delivery outcomes, her interrelations specifically with the new born with poorer overall health and influences negatively on offspring from the intrauterine life passing by complicated delivery experiencing hard unstable childhood reaching unhealthy adolescence and adulthood. These negative consequences necessitate a great attention for prevention, screening and prompt treatment for antenatal and postnatal depression to prevent such disastrous effects.

Keywords: Enterprise Resource Planning, Cloud ERP, Artificial Intelligence, Big Data, Business Intelligence System, S/4 HANA

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Mini Review

Perinatal depression has been identified with its multidomain serious adverse outcomes on mother, foetus from his intrauterine life passing by child birth till childhood, adolescence up to adulthood, family and society with various effects on many aspects of life. This necessitates a multidisciplinary approach for prevention, screening and early treatment for mothers with perinatal depression to prevent such devastating complications [1-4].

Pregnant women with depression are highly probable to have bad nutrition with insufficient body weight gain, miss her prenatal meetings, have poor state of health, develop preeclampsia or gestational diabetes, be involved in risky behaviours such as substance use, tobacco smoking and alcohol drink with their subsequent adverse outcomes on both mother and foetus, to undergo elective operative delivery and to have poor Maternal-foetal attachment [4, 5].

From womb to tomb, there is continuation in foetal to infant, adolescence and adult neurobehavior. Foetal heart rate variability or foetal heart reactivity are common indicators for the differences in central and autonomic nervous systems linked to types of destined emotion control problems and psychopathology risk. Both of them are greatly

affected by maternal exposure to stressors and depression, the effects of depression are appearing in the form of a higher baseline of foetal heart rate, a tardy foetal heart rate responsiveness to exterior stimuli and increased time to get back to baseline level after stimulation, Also maternal depression influences foetal movements, activity and sleep pattern in the form of increased the time of foetal activity with less time spent in quite sleep as monitored by ultrasound [1, 6].

These foetal changes in heart rate, activity and sleep pattern with long term future effects on neurobehavior and development could be explained by increased activity of hypothalamic pituitary adrenal axis and high resistance of the uterine artery which can be assessed by colour doppler ultrasound by detecting presence of notches sharing the same findings found in preeclampsia [7, 8].

Intrauterine Growth Retardation (IUGR), Preterm Birth (PTB) and Low Birth Weight (LBW) are common unfavourable consequences for depression in pregnant women which mimic the injurious effects of gestational diabetes, preeclampsia, hypertension, substance abuse and smoking on pregnancy. In turn IUGR, PTB and LBW have subsequent serious influence on neonatal, infant and childhood health states, mortality rates and neurodevelopment [2, 9].

In the past, it was believed that postpartum depression has a unidirectional effect on breastfeeding. Recently, a bidirectional interrelation between them has been reported; while postpartum depression decreases the engagement rates for breastfeeding, the non-breastfeed mothers have been recognized to be at a higher risk for depression development. Not only breastfeeding provides a protection against postnatal depression but also enhances a faster recovery from its manifestations [10, 11].

There is a vital testimony that perinatal maternal psychiatric disorders have adverse consequences on offspring in the form of lower birth weight, poorer physical health, neuro-developmental delay including impaired cognition progress, delayed motor development, impaired language acquisition, difficult infant temperament and impaired social-emotional functioning which is defined as young child's ability to create a healthy interrelation with others via an appropriate experiencing, regulation and expression of social life events allowing them to learn and explore surroundings. internalizing and externalizing manifestations are the hall mark features for studying social-emotional functioning, while lying, stealing, inattention, hostility, rules violation and impulsivity are characteristic features for behavioural problems related to externalizing disorders, somatic complaints, withdrawal, anxious and depressive behaviour are special manifestations related to internalizing disorders [3, 12, 13].

Depression during pregnancy is one of the main predictors for infant's negative affectivity which is abroad term that describes individual psychological construct with variable degrees of tendency to experience negative unpleasant emotions like; fear, irritability, anxiety, sadness, guilty sensation and shame that could be assessed thorough Infant Behaviour Questionnaire. Negative affectivity has a strong link to the first and the second trimester depression especially the second one this may be attributable to the fact that differentiation, proliferation and migration of the neurons involved in limbic system and associated areas of the cortex occurs between the 8th and 24th week of pregnancy [14, 15].

Thorough various mechanisms, maternal depression can impact negatively on neonatal, childhood and adolescence intellectual, social, psychological progress and neuroendocrine system. Firstly, poor mothering performance, weak mother child interrelation and overall defective family duties affect breast feeding, the nutritional status and lead to diminished his ability to experience interactive enriching life events. Secondly, interaction between genetic basis and environmental circumstances is one of the main underlying hypotheses for risk transmission of maternal psychiatric disorders. Thirdly, type, duration and timing of intrauterine and early postpartum exposure to certain nutrients, smoking, alcohol, medications or physiological transformations

accompanying maternal psychiatric conditions leads to long term affection on child cardiovascular, endocrinal, metabolic systems and early sleep pattern with special concern to Hypothalamic Pituitary Adrenal (HPA) axis influencing the emotional growth and maturation, physical wellbeing and circadian rhythm control [16, 17].

The economic burden of peripartum depression

There is a huge economic burden of peripartum depression due to its devastating impact on mother and offspring related to health care facilities utilization or disutility, educational support, social support, criminal issues and work-related problems. Due to the branching and multiple domain effects of peripartum depression, there is a difficulty in accurate and total estimation for the economic cost [18].

For example, but not limited, families with mothers suffering from postpartum depression has been recognized with their high overall medical, pharmaceutical spending and outpatient clinic visits in comparison to the unaffected households. The yearly depressed mother's medical and pharmaceuticals spending was estimated by about \$19,611 which is significantly higher than \$15,410 for her counterpart non-depressed mother [19].

Children for depressed mothers after their childbirth spent about \$24,572 as a healthcare expenditure within their 1st two years which is higher than \$21,946 spent by similar age group children for non-depressed mothers [20].

Pre-term births resulting from mothers' depression in pregnancy has branching multi domain costs that cannot be totally measured. The costs were about £974 per child subjected to antepartum depression for health and social care, £418 for health-related quality of life losses, £20 for education, £22 for productivity losses, £14 for costs of parents' out-of-pocket expenditure [18]. In conclusion, perinatal depression has major and branching adverse consequences on mother's overall health with a negative impact on interpersonal relationship especially with her new born and offspring's general and mental health along his course from womb to tomb.

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