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Mental health issues during pregnancy - overview of the current knowledge..

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Streszczenie

Zaburzenia depresyjne w ciąży i okresie okołoporodowym stanowią wyzwanie diagnostyczne i coraz częściej występujący problem społeczny. Częstość występowania depresji w ciąży waha się od 10% do 16%, a około jedna trzecia wszystkich przypadków depresji poporodowej ma swój początek jeszcze w okresie ciąży. Od początku 2019r. obowiązuje Rozporządzenie Ministra Zdrowia z dnia 16 sierpnia 2018r. w sprawie standardu organizacyjnego opieki okołoporodowej, które po raz pierwszy wprowadziło obowiązek trzykrotnego przeprowadzenia badania przesiewowego w kierunku zaburzeń depresyjnych - dwukrotnie w czasie ciąży i raz w okresie okołoporodowym, definiowanym jako pierwsze 6 tygodni po porodzie. W związku z powyższym dokonano przeglądu aktualnej i dostępnej literatury

dotyczącej problemu występowania zaburzeń depresyjnych w okresie ciąży i możliwych czynników zwiększających ryzyko ich wystąpienia.

Słowa kluczowe: depresja, ciąża

Summary

Depressive disorders of antenatal and postnatal period are diagnostic challenge, as well as increasingly frequent social problem. Incidence of antenatal depression varies from 10% to 16%. Around one third of all postpartum depression cases has its beginning during the antenatal period. From the beginning of 2019, Ministry of Health's regulations specified for the first time the recommendation to perform screening of depressive symptoms - twice during the pregnancy and once during the perinatal period, defined as the first six weeks after the delivery. Therefore the review of current studies in the subject of mental health issues during pregnancy was conducted in order to establish possible risk factors.

Key words: depression, pregnancy

Introduction and purpose

The most difficult aspect of stating a diagnosis is when none of the up-to-date, modern and advanced medical tools isn't sufficient for an unambiguous diagnosis. That is the case when it comes to depression - a disease which perpetually does not have a diagnosis method, which beyond a reasonable doubt can answer the question, whether the patient is ill or not.

According to the World Health Organization over 264 million people of all ages suffer from depression [1].

Mental health of a women in the context of being a mother became a subject of interest already in the ancient times, mostly considering tragically ended postpartum psychosis. Then, after a very long intermission, the subject was brought back by Plater between XVII and XVIII century and the cases of postpartum psychosis, „maternal instincts disturbances” or „hatred towards babies” were reported. At the beginning, all of the cases mentioned above were attributed to the poor women who had illegitimate, unwanted children. Cases of such situations among married women were reported reluctantly [2].

Motherly „melancholia” was pictured by E. Dumas in the French literary work translated as the „killing young children by their parents”. One of the described by Dumas cases was women who sold everything to prepare farewell feast for her children, then strangulated all of them in their sleep and killed herself [3]. Such reports started to become more and more frequent. Pioneer Gordon's studies about etiology and course of mild peripartum mood disturbances started the new era of depression history [4]. In 1968 Pitt - psychiatrist - drew attention toward this atypical problem of depression among women after delivering a baby [5].

According to the society norms it was known and in most of the cases - still is - that pregnancy, birth and postpartum period are the time of constant joy of expecting the offspring, some kind of the „protected time” from all kinds of sorrow, sadness, lack of strength, despair. At the moment of getting pregnant, automatically the society's perception of woman changes and she is not seen as an individual with a separate psychological condition any more.

Considering this approach relatively few thorough studies were conducted about depression during pregnancy and the existing ones include wide range of results. This review aims to collect the existing data on the subject of depression cases during pregnancy, about its prevalence and risk factors to help with screening and prevention of mental health issues in pregnancy. The topic is important considering the obligatory depression screening during pregnancy, that started in 2019.

Brief description of the state of knowledge

One of the oldest available studies - from 1994 stated that the problem of depression affects about 10% of pregnant women [6]. In 1998 the suggested prevalence reached even 25% of pregnant women [7]. In meta-analysis from 2005 the incidence of major depressive episode was estimated as 3,8% at the end of the first trimester, 4,9% at the end of the second and 3,1% at the end of the third trimester of pregnancy [8]. Recent studies report that even one third of all of the postpartum depression cases has its beginning during pregnancy [9]. At the same time it is difficult to point whose responsibility it is to detect the first signs of mental health issues among pregnant women.

The most frequent health care providers to contact pregnant women are obstetrician-gynecologists during scheduled visits, sometimes this job is executed by the midwife when the pregnancy is considered to be physiological. When affected by not-gynecological malignancies woman turns to general practitioner and during postpartum period again the midwife is the one to contact. There are a few situations when the pregnant woman has a possibility to visit a psychologist or psychiatrist and usually are caused by mental health issues detected before the pregnancy. This shifts

the weight of the identification of subtle signs of mental health disorders towards the stated above health care providers. It is worth mentioning these groups until 2019 weren't equipped with any screening tools.

Obligatory depression screening

At the beginning of 2019 the Ministry of Health's Directive from the 16th of August 2018 entered into force and introduced the obligatory screening which is the part of standardized care during pregnancy and labour. Screening towards the depression symptoms is supposed to be performed three times - twice during the pregnancy — between 11 and 14 weeks, then between 33 and 37 weeks and once in the postpartum period, within the first 6 weeks after the delivery date [10]. The Directive unfortunately doesn't precise the tool that should be chosen to perform the screening, leaving an open field to the interpretation. According to the recommendations the patient selected during the screening as the one with higher risk of depression should be referred to psychologist and in some cases to psychiatrist.

Depression during pregnancy - what do we know about the risk factors

According to some of the available data the age of woman during pregnancy doesn't correlate with the prevalence of depression [11, 12, 13]. In the studies where the correlation with age was found, the age group with the highest risk of depression were young mothers - younger than 20 years old [14, 15, 16] or at the other side - the oldest pregnant women [14, 17, 18].

Lower education status as well as low income, poor housing conditions and financial problems are one numerously mentioned as risk factors of depression during pregnancy [19, 20, 21]. Also it seems to be important whether a woman has a significant other during the time of pregnancy. Lack of partner's support during this large life changing event was frequently listed as a depression risk factor [22, 23, 24, 25, 26]. But what is interesting in some studies the importance of the quality of the relationship was underlined to be a protective factor, not being in the relationship in general [27]. Risk of depression rises when women stay home full time or are unemployed comparing to working women [28, 29], as well as the poor working conditions and possible discrimination due to pregnancy impact the mental health of a pregnant woman [30].

Depending on personal capabilities and coping mechanisms different stressful events can cause increased risk of depression. This includes divorce, conflicts with partners, losing job [31]. Among frequently mentioned was the fact of sexual abuse especially during childhood which severely affects the pathophysiology of central nervous system [32]. Women who experience this kind of trauma suffer from stress reaction system damage including sympathetic system disruption and serotonin flow [33].

Health condition seems to be important factor when it comes to depression in general. It was proved that carbohydrates disorders - gestational diabetes as well as diabetes before pregnancy, both type I and II increase the risk of depression during pregnancy [34, 35, 36, 37]. Hyperglycaemia and insulin resistance which occur during pregnancy cause increased levels of stress hormones including cortisol and exacerbate depressive symptoms [38, 39]. Fear of the consequences of fetal and maternal complications during pregnancy and labour typical for gestational diabetes are also mentioned among depression causes [39]. Thyroid dysfunction was not proven to be a factor for depression during pregnancy nor has been the intake of L-thyroxine [40]. Smoking cigarettes before pregnancy increased the risk of depression [41, 42].

Obstetric history was also a subject of interest when it comes to an impact on depressive symptoms during pregnancy. Most often the number of previous pregnancies did not change the prevalence of depression [43]. When it comes to the duration of pregnancy it is stated that the highest risk of depression occurs during the 3rd trimester and the lowest during the 1st trimester of pregnancy [44]. There is no difference in depression prevalence comparing women who experienced vaginal delivery and cesarean section [45, 46]. Numerous of previous obstetric complications seem to cause depressive symptoms during following pregnancies, such as complications during labour, intrauterine fetal death, pregnancy losses [47, 48, 49, 50]. According to WHO recommendation it is important to wait 6 months after pregnancy loss to minimize the risk of mental health issues during next pregnancy [51].

Considering the consequences of depression for the condition of current pregnancy it was demonstrated that women depressed during pregnancy give birth to children with lower birth weight and more often experience preterm birth [52, 53, 54].

Currently the most important and well documented depression risk factor remain previously experienced mental health issues, especially depression and anxiety disorder [55, 56, 57]. In one of the conducted studies it was pointed out that even one half of pregnant women diagnosed with depression suffered previously from major depressive episode [58]. Another depressive episode in life which takes place during pregnancy favors the risk of maintaining the symptoms also after the delivery of the baby, which means it increases also the risk of postpartum depression [59].

Conclusions

Depression during pregnancy - a time of dynamic hormonal, physical, psychological and social changes - remains hidden under a number of situations that appear to the society as „normal” for the time of pregnancy, which causes frequent oversight of evident symptoms. The subject of mental health issues during pregnancy is still a blank within the scientific approach as well as social awareness.

Research on risk factors and establishing suitable diagnostic tools, especially considering cultural differences in countries, needs to be performed in a wider range.

References

1. WHO <https://www.who.int/news-room/fact-sheets/detail/depression>
2. Dewhurst WG.: Melancholia and depression: from hippocratic times to modern times. *J. Psychiatry Neurosci.* 1992; 17: 81-83
3. Dumas E. Du libericide ou meurtre des enfants mineurs par leurs parents, these de medecine, Lyon, A. Storck, 1892, 91
4. Gordon RE, Gordon K: Some social-psychiatric aspects of pregnancy and childbearing. *J Med Soc NJ* 1957; 54:569-572
5. Pitt B, "Atypical" depression following childbirth. *The British Journal of Psychiatry* 1968,, 114, 1324-1335
6. Cox J.L., Holden J.M.: Perinatal psychiatry: Use and misuse of the Edinburgh Postnatal Depression Scale, London 1994, Gaskell
7. Bolton H.L., Hughes P.M. Turton P., Sedgwick P.: Incidence and demographic correlates of depressive symptoms during pregnancy in an inner London population. *Journal of Psychosomatic Obstetrics and Gynaecology* 1998, 19, 202-209
8. Gavin NI, Gaynes BN, Lohr KN, Meltzer-Brody S, Gartlehner G, Swinson T. Perinatal depression: A systematic review of prevalence and incidence. *Obstet. Gynecol.* 2005; 106(5 Pt 1); 1071–1083
9. Wisner KL, Sit DKY, McShea MC, Rizzo DM, Zoretich RA, Hughes CL i wsp. Onset timing, thoughts of self-harm, and diagnoses in postpartum women with screen-positive depression findings. *JAMA Psychiatry* 2013; 70(5): 490–498
10. Rozporządzenie Ministra Zdrowia z dnia 16 sierpnia 2018 r. w sprawie standardu organizacyjnego opieki okołoporodowej, Dz.U. 2018 poz. 1756
11. Agostini F., Neri E., Salvatori P., Dellabartola S., Bozicevic L., Monti F. Antenatal depressive symptoms associated with specific life events and sources of social support among Italian women. *Matern. Child Health J.* 2015; **19**:1131–1141.
12. Abuidhail J., Abujilban S. Characteristics of Jordanian depressed pregnant women: a comparison study. *J. Psychiatr. Ment. Health Nurs.* 2014; **21**:573–579.
13. Pope, C.J., Mazmanian, D., 2016. Breastfeeding and Postpartum Depression: An Overview and Methodological Recommendations for Future Research. *Depress. Res. Treat.* 2016, 4765310.
14. Raisanen S., Lehto S.M., Nielsen H.S., Gissler M., Kramer M.R., Heinonen S. Risk factors for and perinatal outcomes of major depression during pregnancy: a population-based analysis during 2002–2010 in Finland. *BMJ Open.* 2014; **4**:e004883.
15. Weobong B., Soremekun S., Ten Asbroek A.H., Amenga-Etego S., Danso S., Owusu-Agyei S., Prince M., Kirkwood B.R. Prevalence and determinants of antenatal depression among pregnant women in a predominantly rural population in Ghana: the DON population-based study. *J. Affect. Disord.* 2014; **165**:1–7.
16. Astbury, J., Brown, S., Lumley, J., Small, R., 1994. Birth events, birth experiences and social differences in postnatal depression. *Aust. J. Public Health* 18(2), 176-184.
17. Fisher J., Tran T., Duc Tran T., Dwyer T., Nguyen T., Casey G.J., Anne Simpson J., Hanieh S., Biggs B.A. Prevalence and risk factors for symptoms of common mental disorders in early and late pregnancy in Vietnamese women: a prospective population-based study. *J. Affect. Disord.* 2013; **146**:213–219.

18. Fellenzer J.L., Cibula D.A. Intendedness of pregnancy and other predictive factors for symptoms of prenatal depression in a population-based study. *Matern. Child Health J.* 2014;**18**:2426–2436.
19. Bodecs T., Szilagy E., Cholnoky P., Sandor J., Gonda X., Rihmer Z., Horvath B. Prevalence and psychosocial background of anxiety and depression emerging during the first trimester of pregnancy: data from a Hungarian population-based sample. *Psychiatr. Danub.* 2013;**25**:352–358.
20. Prady S.L., Pickett K.E., Croudace T., Fairley L., Bloor K., Gilbody S., Kiernan K.E., Wright J. Psychological distress during pregnancy in a multi-ethnic community: findings from the born in Bradford cohort study. *PLoS One.* 2013;**8**:e60693.
21. Brummelte, S., Galea, L.A.M., 2016. Postpartum depression: Etiology, treatment and consequences for maternal care. *Horm. Behav.* 77, 153-166
22. Ogbo, F.A., Eastwood, J., Hendry, A. *et al.* Determinants of antenatal depression and postnatal depression in Australia. *BMC Psychiatry* **18**, 49 (2018).
23. Bayrampour H., McDonald S., Tough S. Risk factors of transient and persistent anxiety during pregnancy. *Midwifery.* 2015;**31**:582–589.
24. Ratcliff B.G., Sharapova A., Suardi F., Borel F. Factors associated with antenatal depression and obstetric complications in immigrant women in Geneva. *Midwifery.* 2015
25. Abbasi, M., Van den Akker, O., Bewley, C., 2014. Persian couples' experiences of depressive symptoms and health-related quality of life in the pre- and perinatal period. *J. Psychosom. Obstet. Gynaecol.* 35(1), 16-21.
26. Baxter, A.J., Patton, G., Scott, K.M., Degenhardt, L., Whiteford, H.A., 2013. Global Epidemiology of Mental Disorders: What Are We Missing? *PLoS ONE* 8(6), e65514.
27. Bilszta J.L., Tang M., Meyer D., Milgrom J., Ericksen J., Buist A.E. Single motherhood versus poor partner relationship: outcomes for antenatal mental health. *Aust. N. Z. J. Psychiatry.* 2008;**42**:56–65.
28. Rubertsson C., Hellstrom J., Cross M., Sydsjo G. Anxiety in early pregnancy: prevalence and contributing factors. *Arch. Womens Ment. Health.* 2014
29. Yanikkerem E., Ay S., Mutlu S., Goker A. Antenatal depression: prevalence and risk factors in a hospital based Turkish sample. *J. Pak. Med. Assoc.* 2013;**63**:472–477.
30. Cooklin A.R., Rowe H.J., Fisher J.R. Employee entitlements during pregnancy and maternal psychological well-being. *Aust. N. Z. J. Obstet. Gynaecol.* 2007;**47**:483–490.
31. Horowitz, J.A., Goodman, J., 2004. A Longitudinal Study of Maternal Postpartum Depression Symptoms. *Res. Theory Nurs. Pract.* 18(2), 149-163.
32. Murray, L., Dunne, M.P., Van Vo, T., Anh, P.N., Khawaja, N.G., Cao, T.N., 2015. Postnatal depressive symptoms amongst women in Central Vietnam: a cross-sectional study investigating prevalence and associations with social, cultural and infant factors. *BMC Pregnancy Childbirth* 15(1), 234.
33. Lara MA, Navarrete L, Nieto L, Le HN. Childhood abuse increases the risk of depressive and anxiety symptoms and history of suicidal behavior in Mexican pregnant women. *Rev Bras Psiquiatr.* 2015;**37**(3):203–10.
34. Katon JG, Russo J, Gavin AR, Melville JL, Katon WJ. Diabetes and depression in pregnancy: is there an association?. *J Womens Health (Larchmt).* 2011;**20**(7):983-989.
35. Langer N, Langer O Comparison of pregnancy mood profiles in gestational diabetes and preexisting diabetes. *Diabetes Educ.* 2000 Jul-Aug; 26(4):667-72.
36. Lee KW, Ching SM, Devaraj NK, et al. Diabetes in Pregnancy and Risk of Antepartum Depression: A Systematic Review and Meta-Analysis of Cohort Studies. *Int J Environ Res Public Health.* 2020;**17**(11):3767. Published 2020 May 26.

37. Azami M, Badfar G, Soleymani A, Rahmati S. The association between gestational diabetes and postpartum depression: A systematic review and meta-analysis. *Diabetes Res Clin Pract.* 2019 Mar;149:147-155
38. Daniells S., Grenyer B.F., Davis W.S., Coleman K.J., Burgess J.-A.P., Moses R.G. Gestational diabetes mellitus: Is a diagnosis associated with an increase in maternal anxiety and stress in the short and intermediate term? *Diabetes Care.* 2003;26:385–389.
39. Lapolla A., Di Cianni G., Di Benedetto A., Franzetti I., Napoli A., Sciacca L., Torlone E., Tonutti L., Vitacolonna E., Mannino D. Quality of Life, Wishes, and Needs in Women with Gestational Diabetes: Italian DAWN Pregnancy Study. *Int. J. Endocrinol.* 2012;2012:1–6.
40. Costantine MM, Smith K, Thom EA, Casey BM, Peaceman AM, Varner MW, Sorokin Y, Reddy UM, Wapner RJ, Boggess K, Tita ATN, Rouse DJ, Sibai B, Iams JD, Mercer BM, Tolosa JE, Caritis SN, VanDorsten JP; Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD) Maternal-Fetal Medicine Units (MFMU) Network, Bethesda, MD. Effect of Thyroxine Therapy on Depressive Symptoms Among Women With Subclinical Hypothyroidism. *Obstet Gynecol.* 2020 Apr;135(4):812-820.
41. Fellenzer J.L., Cibula D.A. Intendedness of pregnancy and other predictive factors for symptoms of prenatal depression in a population-based study. *Matern. Child Health J.* 2014;18:2426–2436.
42. Smedberg J., Lupattelli A., Mardby A.C., Overland S., Nordeng H. The relationship between maternal depression and smoking cessation during pregnancy – a cross-sectional study of pregnant women from 15 European countries. *Arch. Womens Ment. Health.* 2015;18:73–84.
43. Fisher J., Tran T., La B.T., Kriitmaa K., Rosenthal D., Tran T. Common perinatal mental disorders in northern Viet Nam: community prevalence and health care use. *Bull. World Health Organ.* 2010;88:737–745.
44. Okagbue HI, Adamu PI, Bishop SA, Oguntunde PE, Opanuga AA, Akhmetshin EM. Systematic Review of Prevalence of Antepartum Depression during the Trimesters of Pregnancy. *Open Access Maced J Med Sci.* 2019 May 14;7(9):1555-1560.
45. Ajinkya S., Jadhav P.R., Srivastava N.N. Depression during pregnancy: Prevalence and obstetric risk factors among pregnant women attending a tertiary care hospital in Navi Mumbai. *Ind. Psychiatry J.* 2013;22:37–40.
46. Rasmussen, M.L.H., Strom, M., Wohlfahrt, J., Videbech, P., Melbye, M., 2017. Risk, treatment duration, and recurrence risk of postpartum affective disorder in women with no prior psychiatric history: A population-based cohort study. *Plos Med.* 14(9), e1002392
47. Waqas A., Raza N., Lodhi H.W., Muhammad Z., Jamal M., Rehman A. Psychosocial factors of antenatal anxiety and depression in pakistan: is social support a mediator? *PLoS One.* 2015;10:e0116510.
48. Stewart R.C., Umar E., Tomenson B., Creed F. A cross-sectional study of antenatal depression and associated factors in Malawi. *Arch. Womens Ment. Health.* 2014;17:145–154.
49. Armstrong D.S. Impact of prior perinatal loss on subsequent pregnancies. *J. Obstet. Gynecol. Neonatal Nurs.* 2004;33:765–773.
50. Faisal-Cury A., Rossi Menezes P. Prevalence of anxiety and depression during pregnancy in a private setting sample. *Arch. Womens Ment. Health.* 2007;10:25–32.
51. WHO . World Health Organization; Geneva, Switzerland: 2005. Report of a WHO Technical Consultation on Birth Spacing.
52. Wado YD, Afework MF, Hindin MJ. Effects of maternal pregnancy intention, depressive symptoms and social support on risk of low birth weight: a prospective study from southwestern Ethiopia. *PLoS One.* 2014;9(5):e96304
53. Rahman A, Bunn J, Lovel H, Creed F. Association between antenatal depression and low birthweight in a developing country. *Acta Psychiatr Scand.* 2007;115(6):481–6.

54. Sanchez SE, Puente GC, Atencio G, et al. Risk of spontaneous preterm birth in relation to maternal depressive, anxiety, and stress symptoms. *J Reprod Med.* 2013;58(1-2):25–33.
55. Akcal X.A.P., Ayd X.N.N., Yaz X.C.X.E., Aksoy A.N., Kirkan T.S., Daloglu G.A. Prevalence of depressive disorders and related factors in women in the first trimester of their pregnancies in Erzurum, Turkey. *Int. J. Soc. Psychiatry.* 2014
56. Giardinelli L., Innocenti A., Benni L., Stefanini M.C., Lino G., Lunardi C., Svelto V., Afshar S., Bovani R., Castellini G., Faravelli C. Depression and anxiety in perinatal period: prevalence and risk factors in an Italian sample. *Arch. Womens Ment. Health.* 2012;15:21–30.
57. Verreault N., Da Costa D., Marchand A., Ireland K., Dritsa M., Khalife S. Rates and risk factors associated with depressive symptoms during pregnancy and with postpartum onset. *J. Psychosom. Obstet. Gynaecol.* 2014;35:84–91
58. Marcus S.M., Flynn H.A., Blow F.C., Barry K.L. Depressive symptoms among pregnant women screened in obstetrics settings. *J. Womens Health (Larchmt)* 2003;12:373–380.
59. Andersson L., Sundstrom-Poromaa I., Wulff M., Astrom M., Bixo M. Depression and anxiety during pregnancy and six months postpartum: a follow-up study. *Acta Obstet. Scand.* 2006;85:937–944.