ORIGINAL PAPER

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Depressive symptoms during pregnancy and their risk factors – a cross-sectional study

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ABSTRACT

Introduction. It was established that intragestational depression is a common disease, with the estimated average prevalence of 10–25% in all expectant mothers worldwide.

Aim of the study. The aim of the study was to evaluate the frequency of depressive symptoms in pregnant women in Poland and to identify which factors may be related to a higher risk of depressive symptoms during pregnancy.

Material and methods. A prospective cross-sectional study was performed. Depressive symptoms were assessed with the validated Edinburgh Postnatal Depression Scale (EPDS). 346 women were enrolled in the study.

Results. 130 women (37.6%) scored 13 or more points and were considered as presenting with depressive symptoms. Independent risk factors of depressive symptoms during pregnancy including mood disorders diagnosed before the current pregnancy (aOR=2.68, 95%CI 1.37-5.22), mental disorders confirmed in family members (aOR=2.72, 95%CI 1.24-5.98), unhappiness in their current relationship (aOR=4.0, 95%CI 1.77-9.01), lack of support from family members (aOR=2.73, 95%CI 1.51-4.96) increased the risk of DS and good financial status decreased the risk of DS occurrence (aOR=0.45, 95%CI: 0.25-0.80).

Conclusions. Pregnant women commonly report depressive symptoms. The evaluation of relations with the family members, socio-economic status, former depressive symptoms and possible prenatal depression are essential for proper screening of depression in pregnant women.

Keywords. depression risk factors, depressive symptoms, Edinburgh Postnatal Depression Scale, perinatal depression, pregnancy

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Introduction

It was established that intragestational depression is a common disease, with an estimated average prevalence of 10-25% in all expectant mothers worldwide.[1,2]selective serotonin re-uptake inhibitors (SSRIs According to a frequently cited hypothesis, hormonal changes occurring physiologically during gestation are related to decreased mood, which may further evolve into perinatal depression (PD).[3,4] However, other factors may increase the risk of PD occurrence among pregnant women, with mood and anxiety disorders in a patient's medical history, lack of support from a partner and other family members, significant stress and addictions being mentioned the most commonly. Gestation-related complications or ambivalent feelings towards the pregnancy itself may also raise the risk of PD occurrence.[2]but the burden of MDD attributable to perinatal depression is not yet known. There has been little effort to date to systematically review available literature and produce global estimates of prevalence and incidence of perinatal depression. Enhanced understanding will help to guide resource allocation for screening and treatment. Methods A systematic literature review using the databases PsycINFO and PubMED returned 140 usable prevalence estimates from 96 studies. A random-effects meta-regression was performed to determine sources of heterogeneity in prevalence estimates between studies and to guide a subsequent random-effects meta-analysis. Results The meta-regression explained 31.1% of the variance in prevalence reported between studies. Adjusting for the effects of all other variables in the model, prevalence derived using symptom scales was significantly higher than prevalence derived using diagnostic instruments (odds ratio [OR] 1.6, 95% confidence interval [CI] 1.3–2.0

The prevalence of PD varies around the world.[1,5,6]selective serotonin re-uptake inhibitors (SSRIs According to the literature up to 51% of pregnant women in South Korea may suffer from PD, while only 10% of expectant mothers in the United States fit the diagnostic criteria of perinatal depression.[2]but the burden of MDD attributable to perinatal depression is not yet known. There has been little effort to date to systematically review available literature and produce global estimates of prevalence and incidence of perinatal depression. Enhanced understanding will help to guide resource allocation for screening and treatment. Methods A systematic literature review using the databases PsycINFO and PubMED returned 140 usable prevalence estimates from 96 studies. A random-effects meta-regression was performed to determine sources of heterogeneity in prevalence estimates between studies and to guide a subsequent random-effects meta-analysis. Results The meta-regression explained 31.1% of the variance in prevalence reported between studies. Adjusting for the effects of all other

variables in the model, prevalence derived using symptom scales was significantly higher than prevalence derived using diagnostic instruments (odds ratio [OR] 1.6, 95% confidence interval [CI] 1.3–2.0 A general tendency towards a higher frequency of possible PD cases in lower-income countries is observed, which may suggest a significant role of socio-economic factors in its development.

According to a regulation by the Polish Ministry of Health, each pregnant woman should undergo screening for perinatal depression twice during pregnancy - in the first and the third trimester, with two recommended questionnaires being EPDS and Beck's Depression Inventory.[7] A positive screening test or the presence of risk factors should be followed by a more detailed examination of a patient's mental state by either a psychologist or a psychiatrist.

If left untreated, intragestational depression may contribute to a number of complications which may affect the mother, fetus and later the neonate, both during the pregnancy and the postpartum period. Severe postpartum depression is cited most often as a possible complication. However, a higher risk of spontaneous abortion, preterm birth, urgent operative delivery, preeclampsia or restricted fetal growth may also be associated with untreated prenatal depression.[8] Delayed child development was also reported more often in children of mothers who suffered from PD.[9] The aforementioned and other complications may be caused not only by depression itself, but by substance abuse as well, as it is more common among expectant mothers with perinatal depression.[9]

The knowledge of PD risk factors is essential in conducting the proper screening of pregnant women.

Aim of the study

The aim of the study was to evaluate the frequency of depressive symptoms (DS) among pregnant women and to identify which factors may be related to a higher risk of depressive symptoms during pregnancy.

Material and Methods

A cross-sectional study was performed. Polish language version of the questionnaire was distributed via internet between November 2017 and March 2018. A total of 346 pregnant women were enrolled in the study.

We used the validated Edinburgh Postnatal Depression Scale (EPDS). The questionnaire consisted of 46 questions regarding maternal characteristics, sociodemographic status, obstetric and psychiatric history and current pregnancy. It contained a Polish translation of Edinburgh Postnatal Depression Scale (EPDS) - a 10-question scale with each answer scored between 0 and 3 points (minimum total score 0, maximum 30), which is commonly used in screening for possible de-

pression after delivery.[10] EPDS was primarily designed to detect postnatal depression, but it was proved to be an accurate tool for assessing the likelihood of intragestational,[11-13] with a score of 13 and more points being directly related to a high risk of depression.[11-13]

The respondents were asked to answer questions concerning their wellbeing over the past 2 weeks.

The study protocol obtained the approval of the Ethics Committee of the Medical University of Warsaw. The committee waived the obligation to gain a written consent to participate in the study as completing the questionnaire was tantamount to giving the consent.

Statistica 13.3 software was used for statistical analysis, with Mann-Whitney U-test being used for continuous variables and chi-squared test for categorical variables. *P*-values <0.05 were considered significant and all tests were two-tailed.

Results

A total of 386 pregnant women participated in the survey 40 of them were excluded as their questionnaires were completed incorrectly (missing data). Consequently 346 women were enrolled in the study: 182 being in the first trimester of pregnancy (52.6%), 82 in the second (23.7%) and 82 (23.7%) in the third.

216 women (62.4%) scored below 13 points in EPDS. Therefore, they were classified as having no depressive symptoms. 130 women (37.6%) had a score of 13 or more points and were considered as presenting with DS. Basic characteristics of the study group are presented in Table 1.

Lower income was related to a higher occurrence of DS, regardless of the type of the mother's occupation. The highest incidence of DS was reported by women in the first trimester of pregnancy (40.8%), with the rates declining with the progression of pregnancy. Hence, the lowest incidence was observed in the third trimester (27.7%; second trimester - 31.5%).

Women with DS more frequently admitted the current pregnancy had been unplanned (21.5% vs 12.5% in the group without DS, p=0.03). The respondents scoring above 13 points at EPDS significantly more often reported the lack of support from their partners (49.2% vs 17.6%, p<0.001) and family members (44.6% vs 16.2%, p<0.001) as well as unhappiness in their current relationship (28.5% vs 5.1%, p<0.001). Moreover, a larger proportion of those women admitted to having smoked during gestation compared to women with a score below 13 points in the EPDS (31.5% vs 18.1%, p<0.01).

Patients' medical history of mood disorders (49.2% vs 25%, p<0.001) and a history of mental disorders in family members (55.8% vs 44.1%, p<0.001) were more common in the group of women with DS. Except for cervical insufficiency none of the analyzed pregnancy complications were related to the occurrence of DS

in our study group. Cervical insufficiency was reported significantly more often in women presenting with DS. However, the rates were very low in both groups (3.9% vs 0.5%, p=0.02). Women with DS used sedatives (16% vs 5%, p<0.001), antidepressants or psychotherapy (12% vs 5%, p<0.01) more often during pregnancy.

Possible risk factors of DS were evaluated with logistic regression analysis. Only five of the analyzed factors were found to have a statistically significant impact on DS occurrence. They are presented in Table 2.

Mood disorders diagnosed before the current pregnancy, confirmed mental disorders in a family member, unhappiness in the current relationship and lack of support from family members increased the risk of DS while good financial status decreased the risk of DS occurrence.

23.8% of women with DS admitted to having reported them to medical staff, with 17.7% subsequently getting diagnosed with prenatal depression. However, only 2.9% of the respondents stated they had undergone any form of depression treatment (either pharmacotherapy or psychotherapy) recommended by a doctor.

Discussion

Lack of family members support and unhappiness in the relationship seem to be the most relevant risk factors of PD occurrence, because of being relatively indicatable and removable risk factors. A systematic review conducted by Fisher et al. revealed that difficulties in a romantic relationship (a partner who rejected paternity, was unsupportive, uninvolved, critical and quarrelsome or presented unhealthy alcohol drinking behaviors, was violent or unfaithful) had a significant impact on PD occurrence.[14] A higher incidence of PD in women whose partner did not want the pregnancy was also reported by Mukherjee et al.[15] Lack of support from family members was related to PD in a systematic review by Fisher et al.[14] Interestingly the lack of support in the relationship and seems to play a role in DS occurrence rather than the presence of relationship itself. Relationship status was found statistically insignificant.[14] Therefore, we suggested estimating the relations of pregnant women with their family members and attitude to their family situation during every medical examination.

Moreover the present study showed the highest incidence of DS to occur in the first trimester and its decline with the progression of pregnancy, reaching with the lowest numbers reached in the third trimester. Precise percentages of PD occurrence differ between populations. However, most authors report the general numbers to be high. According to the majority of authors the percentage of women suffering from PD during the first trimester of pregnancy oscillated around 25-30%.[16,17] However, occurrences as low as 7.4% or as high as 40.5% were also reported.[18-21] Large discrepancies in reported

Table 1. Characteristics of the study group

	Study group N=346	Women scoring <13 points N=216	%	Women scoring ≥13 points N=130	%	OR (95% CI)	p-value
Age (years)	26.8±4.3*	26.8±3.8*		26.8±5.1*		1.0 (0.95-1.05)	0.99
17-24 years old	115	62	28.7	53	40.8	1.9 (1.2-3.0)	0.007
Education							
junior high school	11	5	23.1	6	4.6	2.40 (0.71-8.15)	
secondary/vocational school	134	77	35.6	57	43.9	1.48 (0.94-2.32)	0.11
university	201	134	62.0	67	51.5	1.0	
Place of residence							
village	87	57	26.4	30	23.1	0.92 (0.48-1.75)	
town <20 000	43	26	12.0	17	13.1	1.14 (0.53-2.47)	
town 20000-100000	73	43	19.9	30	23.1	1.21 (0.62-2.36)	0.93
city 100000-500000	69	43	19.9	26	20.0	1.05 (0.53-2.08)	
city >500 000	74	47	21.8	27	20.8	1.0	
Occupation							
unemployed	71	41	19.0	30	23.1	1.0	
mental	152	92	42.6	60	46.1	0.89 (0.50-1.58)	
physical	28	17	7.9	11	8.5	0.88 (0.36-2.16)	0.39
partly mental and partly physical	95	66	30.6	29	22.3	0.60 (0.32-1.14)	
Marital status							
single	22	10	4.6	12	9.2	1.75 (0.64-4.77)	0.89
in a relationship	324	206	95.4	118	90.8	1.0	
Household income							
poor	15	2	0.9	13	10.0	5.55 (1.18-26.05)	
average	89	41	19.0	48	36.9	1.0	<0.001
good	202	147	68.0	55	42.3	0.32 (0.19-0.54)	
very good	40	26	12.0	14	10.8	0.46 (0.21-1.00)	
Primiparity	247	160	74.1	87	66.9	1.41 (0.88-2.27)	0.15
Previous vaginal delivery	84	45	20.8	39	30.0	0.61 (0.37-1.01)	0.06
Assisted reproductive techniques	43	29	13.4	14	10.7	0.78 (0.39-1.53)	0.46
Smoking during pregnancy	80	39	18.1	41	31.5	2.09 (1.26-3.47)	<0.01
Alcohol consumption during pregnancy	37	20	9.3	17	13.1	1.47 (0.74-2.93)	0.27
Trimester of pregnancy							
1st	182	129	59.7	53	40.8	1.0	
2nd	82	41	19.0	41	31.5	0.18 (0.09-0.35)	<0.01
3rd	82	46	21.3	36	27.7	0.08 (0.04-0.16)	
Unplanned pregnancy	55	27	12.5	28	21.5	2.10 (1.16-3.82)	0.03
Infertility	73	45	20.8	28	21.5	1.44 (1.08-1.92)	0.04
Mood disorders before the current pregnancy	116	52	25	64	49.2	3.06 (1.92-4.87)	<0.001
Mental disorders in family members	86	38	44.1	48	55.8	2.74 (1.66-4.52)	<0.001
Lack of partner support	102	38	17.6	64	49.2	4.54 (2.78-7.42)	<0.001
Lack of other family member support	93	35	16.2	58	44.6	4.16 (2.53-6.87)	<0.001
Unhappiness in relationship	48	11	5.1	37	28.5	7.94 (3.87-16.29)	<0.001
Pregnancy complications:							
Gestational diabetes	22	13	6.0	9	6.9	0.86 (0.36-2.07)	0.74
Gestational hypertension	14	7	3.2	7	5.4	0.59 (0.20-1.72)	0.33
Cholestasis of pregnancy	4	2	0.9	2	1.4	0.60 (0.08-4.30)	0.61
Iron-treated anemia	48	27	12.5	21	16.2	0.74 (0.40-1.37)	0.34
Vaginal bleeding during pregnancy	60	34	15.7	26	20.0	0.75 (0.42-1.31)	0.31
Cervical insufficiency	6	1	0.5	5	3.9	0.12 (0.01-1.01)	0.02

* – average ± standard deviation

OR – odds ratio

95% CI – 95% coefficient interval

Table 2. Independent risk factors of depressive symptoms during pregnancy

	Study group N=346	Women scoring <13 points N=216	%	Women scoring ≥13 points N=130	%	aOR (95% CI)	p-value
Mood disorders before the current pregnancy	116	52	25	64	49.2	2.68 (1.37-5.22)	0.004
Mental disorders in family members	86	38	44.1	48	55.8	2.72 (1.24-5.98)	0.013
Lack of family member support	93	35	16.2	58	44.6	2.73 (1.51-4.96)	<0.001
Unhappiness in a relationship	48	11	5.1	37	28.5	4.0 (1.77-9.01)	<0.001
Good financial situation	202	147	68.0	55	42.3	0.45 (0.25-0.80)	<0.01

aOR – adjusted OR (logistic regression)

95% CI – 95% coefficient interval

PD occurrence during the second and third trimester were also observed. Gaynes et al. found the incidence of PD being 8.5% in the second and third trimesters in the populations of England, Scotland, Norway, Portugal, the Netherlands, Australia, the United States, Canada, Hong Kong, and Japan.[20]her children, and other family members. Objectives. We systematically review the evidence on (1 Alqahtani et al. reported the incidence reaching 12.8% and Mikšić et al. - 23% in the third trimester, while Park et al. suggested it may even approximate 61.4% in the third trimester of pregnancy.[21-23] According to Koss et al. every third woman will suffer from depression during at least one trimester of her pregnancy, while for 25% of women the experience of depression will be limited only to one trimester.[24]

Our research, as well as previous studies, confirmed the presence of multiple issues which increase the incidence of DS and, therefore, increase the chance of PD development if present.[3,5,21,23] According to Dimidjian et al. a history of mood disorders constitutes one of the most important factors, which stays in line with our results.[25] In our study pre-pregnancy mood disorders were one of the most significant risk factors of DS. A similar odds ratio was reported by Gebremichael et al. who correlated previous history of depression with a significant impact on PD occurrence.[26]monthly income AOR (95% C.I Mood disorders in family members are an independent risk factor of PD. According to Gebremichael et al. a mental disorder in a close relative is associated with over a 3-fold higher risk of PD.[26]monthly income AOR (95% C.I Our study also showed that confirmed mood disorders in family members were an independent risk factor of DS.

According to our results socioeconomic status played a significant role in DS occurrence. Self-assessment of the financial status as "good" reduced the incidence of DS. Additionally, questionnaires returned via internet may promote honesty of the answers. A small study group and no verification possibility of PD occurrence in the studied cohort constitute a limitation of this study.

DS are not sufficiently reported by pregnant women, with up to 80% of the cases of PD remaining under-recognised by healthcare providers.[27] Implementing screening methods in modern technologies like smartphone applications or websites, which are commonly used by pregnant women, seems feasible and could be considered a way of enforcing a more private or confidential and less impersonal screening method.[27-29] Creating a universal strategy of educating medical professionals regarding the risk factors of PD and developing guidelines for ways of screening for it is also crucial.[29]

Conclusions

Pregnant women commonly report depressive symptoms. The evaluation of relations with the family members, socio-economic status, former depressive symptoms and possible prenatal depression is essential for the proper screening of depression in pregnant women.

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