



THE EFFECTS OF PREVIOUS SPONTANEOUS ABORTION ON THE MENTAL PROBLEMS OF CURRENT PREGNANCY

*Júlia Talabér, Mátyásné Bachorecz, Zsófia Szemes, Ildikó Baji

Department of Family Care Methodology, Faculty of Health Sciences, Institute of Health Promotion and Clinical Methodology, Semmelweis University, Budapest, Hungary
Head of Faculty: prof. Zoltán Zsolt Nagy, PhD

Summary

Introduction. The risk of developing mental illness is significantly increased during pregnancy. The most common obstetric complication is spontaneous abortion. Women with a history of previous spontaneous abortion are at higher risk of developing mental problems during their subsequent pregnancy.

Aim. We examined the effects of a history of previous spontaneous abortion on emotional problems during subsequent pregnancy. We examined 987 pregnant women at the 1st Department of Obstetrics and Gynecology of Semmelweis University in Budapest, Hungary between 01-10-2012 and 31-08-2013. Among them there were 265 pregnant women who had at least one episode of previous spontaneous abortion.

Material and methods. We measured depression using the EPDS test. Anxiety was measured using the Spielberger (STAI) tests. We designed a questionnaire to gather socio-demographic data. We used the Chi-square test and Wald-Wolfowitz test to test for the statistical significance of associations.

Results. We found that 24.21% of the sample had depression, and 8.61% of the sample had anxiety. According to the number of previous spontaneous abortions we compared 3 groups: 722 women had no spontaneous abortion previously, 169 women had one previous spontaneous abortion and 96 women had 2 or more spontaneous abortions before. Depression, anxiety and previous mental illness were examined in these groups. Those women who had spontaneous abortion 2 or more times before got significantly higher scores in the EPDS test, than those who had no or just one spontaneous abortion. Among them 28.1% had mental illness previously. We found that prior mental illness and spontaneous abortions are independent predictors of antenatal depression. Among those women who had 2 or more spontaneous abortions before, the mean age and the number of single women was significantly higher, while the average level of education was significantly lower than in the other two groups.

Conclusions. Higher age, lower level of education and the lack of partner relationship can be associated with the number of spontaneous abortions. The number of episodes of spontaneous abortion and a history of mental illness are risk factors for depression during a subsequent pregnancy.

Key words: pregnancy, depression, anxiety, spontaneous abortion, antenatal depression

INTRODUCTION

Pregnancy and childbirth play an outstanding role in women's life. However, this period might be interrupted by obstetric complications, as well as episodes of mental illness. One of the most common obstetric complications is spontaneous abortion, which almost always results in the decompensation of mental health. There are several known risk factors of spontaneous abortions. Numerous studies examined the effects of several socio-demographic factors on spontaneous abortion. Maconochie et al. examined the effects of socio-demographic factors, such as age, marital status, level of education, smoking or moderate or occasional alcohol consumption, etc. on miscarriage in the United Kingdom. They found that high maternal age, previous spontane-

ous abortions has an increased risk of spontaneous abortion, however there was no association with level of education (1).

In 1992 and 1997 Neugebauer et al. found that age, marital status, and social class were not associated with mental illness after spontaneous abortion (2, 3).

The risk of postpartum depression is found to be between 14-30% in the first three months after birth. In most cases of postpartum depression, it already occurs in the second part of pregnancy (4). Depression is 12-15% more common among multiparas (4) and it has a risk of 7.4%, 12.8%, 12% during first, second and third trimesters of pregnancy (5).

Antenatal depression is also a risk factor of preeclampsia, low birth weight, several obstetric and neonatal complications (6-8).

Preeclampsia, hospitalization during pregnancy, caesarean section with an emergency indication, and hospitalization of the new born baby are risk factors of postpartum depression (9). A history of anxiety increases the risk of postpartum depression with 100%, hence it is a greater risk factor than a history of depression (10).

Neugebeuer et al. confirmed that prior affective symptomatology is a risk factor for depression following miscarriage. Among women with a history of depression, 54% experienced symptoms of depression again in a subsequent pregnancy (3).

In the last decades several studies examined the effects of spontaneous abortions on subsequent pregnancy from both obstetric and mental aspects. Klier et al. in 2002 found that women with a history of miscarriage will more frequently have symptoms of anxiety and depression in a subsequent pregnancy than those who have no history of miscarriage (11).

In a similar study Blackmore et al. defined spontaneous abortion as a predictor of depression in a subsequent pregnancy. They also found that not only the presence of miscarriage is a predictor, but the number of miscarriages too: a higher number of spontaneous abortions significantly increases the risk of developing depression or anxiety in a subsequent pregnancy (12).

Fergusson et al. draws attention to the connection between spontaneous abortion and mental problems during a subsequent pregnancy, which is also a predictor of postpartum depression after miscarriage and the mental problems of a subsequent pregnancy (13). Postpartum depression is also reported to have a negative effect on the stable mother-child attachment (14). The lack of this attachment can be associated with subsequent behavioural problems and depression of the child (11).

Our aim was to examine the interaction between the risk factors of mental illness during pregnancy. We examined the effect of one or more episodes of spontaneous abortion on the risk of developing symptoms of depression and anxiety in a subsequent pregnancy. Are there any other factors besides the history of spontaneous abortion which can cause mental problems during pregnancy?

This study was part of the joint research project undertaken by the Faculty of Health Sciences (Department of Family Care Methodology) and the 1st Department of Obstetrics and Gynecology, at the Budapest Semmelweis University, Hungary. Our dataset, collected between 01-10-2012 and 31-08-2013, included information of 987 pregnant women on episodes of spontaneous abortion and emotional problems during a subsequent pregnancy. The women in the sample voluntarily entered the study during between their 22nd and 40th gestational week, and were provided detailed information.

Our study had three main hypotheses. First, we expect that there is relationship between age, marital status, level of education and the number of miscarriages. Second, we also expect that the number of miscar-

riages has a negative effect on the mental condition of pregnant women. Thirdly, we also expect that previous mental problems are more frequent among women with a history of spontaneous abortion.

SAMPLE

The total sample consists of 987 pregnant women. The mean age was 33 years, the average gestational week was 34.5. The highest average educational level was 15 classes. 66.9% of the sample was married, 30.1% lived in a partnership and 3% was single.

According to the number of previous episodes of spontaneous abortion we formed 3 groups. The first group consisted of 722 women with no history of spontaneous abortion. The mean age in this group 32 years, the average gestational week was 34.6. The highest average level of education was 15 classes. 66.5% of the group was married, 30.2% lived in a partnership and 3% was single.

The second group consisted of 169 women with one spontaneous abortion in their obstetric history. The mean age of the group was 34 years; the average gestational week was 34.5 weeks. The average level of education, just like in the previous group was 15 classes. 71.6% of the group was married, 25.4% lived in a partnership and 3% was single.

The third group consisted of 96 women, they had 2 or more episodes of spontaneous abortion previously. The mean age was 36 years which is significantly higher than in the other two groups ($p \leq 0.05$). The average gestational week was 33.5 weeks. The average level of education was significantly lower than the other two groups, it was 13.8 classes ($p \leq 0.05$). 58.3% was married, 37.5% lived in a partnership and 4.2% was single which is significantly higher than the other two groups ($p \leq 0.05$). The socio-demographic data are shown in table 1.

Table 1. Socio-demographic data of the three groups according to the number of spontaneous abortions

Number of spontaneous abortions	0 (n = 722)	1 (n = 169)	2 or more (n = 96)
Mean age (years)	32	34	36*
Average gestation week	34.6	34.5	33.5
Average level of education (classes)	15	15	13.8*
Married (%)	66.5	71.6	58.3
Partnership (%)	30.2	25.4	37.5
Single (%)	3	3	4.2*

* $p \leq 0.05$, Chi-square

METHOD

We used the Edinburgh Postnatal Depression Scale (EPDS) to measure the level of depression. The questionnaire consists of 10 items, the total score, ranging from 0 to 30, is determined adding together the scores for each of the 10 items. The cut-off score was 9, implying that a woman scoring 9 or above is likely to suffer from clinical level of antenatal depression (15).

Anxiety was measured using the Spielberger State-Trait Anxiety Inventory questionnaires. The State-part of the questionnaires measures the current level of anxiety, where the total score, ranging from 20 to 80, is calculated as the sum of the scores for 20 questions, each rated on a 4-point scale. The cut-off point was 50, implying that 50 or more points indicate a clinical level of anxiety. The second part (Trait) measures the general level of anxiety, again with 20 questions, scores between 20 and 80, and a cut-off score of 50 (16).

We also examined prior mental illness and its effect on the present mental state. We designed a questionnaire on pregnant women’s history of mental illness, which consists of 4 main topics: socio-demographic data, physical health, previous mental state, present mental state. Using the same questionnaire we also obtained information on the history of previous spontaneous abortions, and socio-demographic data. Statistical analysis was performed using the Statistica 12 software. We used the Chi-square test and Wald-Wolfovitz test to test for the statistical significance of associations.

RESULTS

The average score of EPDS test in the whole sample was 5.79. 24.21% of the women reached the clinical level of depression. The average anxiety score was 36.36 in the whole sample, with 8.61% of women reaching the clinical level of anxiety.

In the 3 groups, according to the number of previous spontaneous abortions we reported the following results. Those women who had no history of previous spontaneous abortion had an average score of 5.85 in the EPDS test. 24.65% of them reached the clinical level of depression. Their anxiety score according to the Spielberger test was a 36.30. 8.59% of these pregnant women reached the clinical level of anxiety.

The 169 women who had spontaneous abortion once before, scored on average of 5.46 in the EPDS test. 20.71% of them had a clinical level of depression. As we examined the level of anxiety, we found that the average score was 36.5 in the Spielberger test. 8.28% of them had clinical level of anxiety.

96 women had 2 or more spontaneous abortions, and among them the average score of EPDS test was 5.99. 27.08% of them reached clinical level of depression. The average score of Spielberger test in this group was 36.81. Clinical level of anxiety was found in 9.4% of the group.

We used statistical analysis to examine the relationship between the number of spontaneous abortions and mental state and the relationship between the previous mental illness and the number of spontaneous abortions.

Using the Chi-square test to examine the relationship between the previous mental illness and the number of spontaneous abortions, we found the following 5.96% of women who had no spontaneous abortion before reported symptoms of mental illness, while this proportion was, 15.4% for those who had a history of one spontaneous abortion, and 28.1% for those who had 2 or more episodes of spontaneous abortions. This proportion was significantly higher than in the other two group ($p \leq 0.05$). Table 2 represents these results.

Using the Wald-Wolfovitz test, we compared the average score of EPDS and Spielberger tests in the 3 groups. Those who had no previous spontaneous abortion an average score of 5.92 ± 4.61 in the EPDS test. Those who had 1 spontaneous abortion before scored 5.50 ± 4.16 , Those who had 2 or more spontaneous abortions scored 6.15 ± 4.98 which was significantly higher than the average score in the other 2 groups ($p \leq 0.05$).

As we examined the average score of the Spielberger test in the 3 groups, we found that women with no history of spontaneous abortion scored 36.46 ± 9.69 . Those who had 1 spontaneous abortion previously scored 36.47 ± 8.83 . Those who had 2 or more spontaneous abortions scored 37.22 ± 9.22 . Table 3 represents our results.

Table 2. Examination of previous mental illness in the three groups according to the number of spontaneous abortions.

Mental state	0 (n = 722)	1 (n = 169)	More (n = 96)
EPDS \geq 9	24.65	20.71	27.08
Spielberger \geq 50	8.59	8.28	9.34
Previous mental illness (%)	5.96	15.4	28.1*

*p < 0.05, Chi-square

Table 3. Examination of mental state according to the number of spontaneous abortions.

Mental state	0 (n = 722)	1 (n = 169)	More (n = 96)
EPDS score	5.92 ± 4.61	5.50 ± 4.16	$6.15 \pm 4.98^*$
Spielberger score	36.46 ± 9.69	36.47 ± 8.83	37.22 ± 9.22

*p < 0.05, Wald-Wolfovitz test

Considering that the those women with previous mental problem and 2 or more spontaneous abortions reported significantly higher scores in EPDS questionnaire, we used a multivariable regression model to examine the effect of previous mental illness, the number of spontaneous abortions and the interaction of these two variables on the EPDS score in subsequent pregnancy. Both prior mental illness ($p = 0.000$), and the number of spontaneous abortions ($p = 0.040$) was associated with a significantly higher score in the EPDS test. We found that in an interaction these two variables have significantly negative effect on EPDS score in current pregnancy ($p = 0.006$). These results are represented by table 4.

DISCUSSION

In this study we examined the mental state of pregnant women according to their previous spontaneous abortions.

24.21% of our whole sample ranged the clinical level of depression and 8.61% of them reached clinical level of anxiety.

According to the number of previous episodes of spontaneous abortion we formed 3 groups. The first group consisted of 722 women with no history of spontaneous abortion. The second group consisted of 169 women with one spontaneous abortion in their obstetric history and the third group consisted of 96 women, they had 2 or more episodes of spontaneous abortion previously.

There is relationship between age, marital status, level of education and the number of miscarriages. The mean age of the group having 2 or more spontaneous abortions previously is 36 years which is significantly higher, their average level of education is 13.8 classes,

that is significantly lower than the other two groups. 4.2% was single which is significantly higher than the other two groups.

Examining the relationship between previous mental illness and the number of spontaneous abortions we found the following. 28.1% of those who had 2 or more spontaneous abortions reported symptoms of mental illness before. This proportion was significantly higher than in the other two groups, but lower than Neugebauer et al. found in 1997 (14).

Using the Wald-Wolfowitz test, we compared the average score of EPDS and Spielberger tests in the 3 groups. Those who had 2 or more spontaneous abortions scored 6.15 ± 4.98 which was significantly higher than the average score in the other 2 groups. This result was the same in Blackmore et al research in 2011 (16). We did not find significant difference examining anxiety.

Using a multivariable regression model to examine the effect of previous mental illness, the number of spontaneous abortions and the interaction of these two variables on the EPDS score in subsequent pregnancy we found that previous mental illness, number of spontaneous abortions associated with a significantly higher score in the EPDS test. We found that in an interaction these two variables have significantly negative effect on EPDS score in current pregnancy.

As a result we can say that our findings are similar to the results of other researches. The previous mental illness and number of previous spontaneous abortions has negative effects on the mental state of current pregnancy, increasing the risk for antenatal depression. If these two variables both are in the history, amplifying each other's effects they increase the risk for depression during current pregnancy. □

References

1. Maconochie N, Doyle P, Prior S, Simmons R: Risk factors for first trimester miscarriage – results from a UK-population-based case – control study. *BJOG An International Journal of Obstetrics and Gynaecology* 2007; 170-186. doi:10.1111/j.1471-0528.2006.01193.x
2. Neugebauer R, Kline J, O'Connor P, Shrout P et al.: Determinants of depressive symptoms in the early weeks after miscarriage. *American Journal of Public Health*, 1992; 82: 1332-1339. doi:10.2105/AJPH.82.10.1332
3. Neugebauer R, Kline J, Shrout P et al.: Major Depressive Disorder in the 6 Months After Miscarriage. *JAMA* 1997; 277: 383-388.
4. O'Hara MW, Zekoski EM, Philipps LH: Controlled prospective study of postpartum depression: factors involved in onset recovery. *J Abnorm. Psychol* 1990; 99: 3-17.
5. Bennett HA, Einarson A, Taddio A et al.: Prevalence of depression during pregnancy: Systematic Review. *Obstet & Gynecol* 2004; 103: 698-709.
6. McKee MD, Cunningham M, Jankowski K, Zayas L: Health-related functional status in pregnancy: relationship to depression and social support in a multi-ethnic population. *Obstet & Gynecol* 2001; 97(6): 988-993.
7. Kurki T, Hiilesmaa V, Raitasalo R et al.: Depression and Anxiety in early pregnancy and risk for preeclampsia. *Obstet & Gynecol* 2000; 95: 487-490.
8. Alder J, Fink N, Bitzer J et al.: Depression and anxiety during pregnancy: A risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. *J Matern Fetal Neonatal Med* 2007; 20: 189-209.
9. Blom EA, Jansen PW, Verhulst FC et al.: Perinatal complications increase the risk of postpartum depression. *The Generation*

Table 4. The effect of previous mental illness and spontaneous abortions on antenatal depression.

	Clinical level of depression β coefficient	Level of significance
Number of previous spontaneous abortions	-0.105	0.040
Previous depression	-0.187	0.000
Number of previous spontaneous abortions X Number of previous spontaneous abortions (interaction)	-0.280	0.006

Multivariable regression model $p \leq 0.05$

- R Study. *Obstet & Gynecol* 2010; 117: 1390-1398. **10.** Matthey S, Barnett B, Howie P, Kavanagh DJ: Diagnosing postpartum depression in mothers and fathers: whatever happened to anxiety? *J Affect Disorder* 2003; 74, 139-147. **11.** Klier CM, Geller PA, Ritscher JB: Affective disorders in the aftermath of miscarriage: A comprehensive review. *Arch Womens Ment Health* 2002. doi:10.1007/s00737-002-0146-2 **12.** Robertson Blackmore E, Côté-Arsenault D, Tang W et al.: Previous prenatal loss as a predictor of perinatal depression and anxiety. *BJP* 2011. doi:10.1192/bjp.bp.110.083105 **13.** Fergusson DM, Horwood LJ, Boden JM: Abortion and mental health disorders: evidence from a 30-year longitudinal study. *BJP* 2008. doi:10.1192/bjp.bp.108.056499 **14.** Erős E, Hajós A: A perinatalis depresszió és szorongás megelőzése perikoncepcionális gondozással. *Orvosi Hetilap* 2011: 903-908. doi:10.1556/OH.2011.29119 **15.** Cox J, Chapman G, Murray D, Jones P: Validation of the Edinburgh postnatal depression scale (EPDS) in non-postnatal women. *J Affect Dis* 1995. **16.** Sipos M, Spielberger CD, Sipos K: The development and validation of the Hungarian form of the Test Anxiety Inventory. *Advances in Test Anxiety Research* 1986:, 221-228. **17.** Matthey S, Ross-Hamid C: The validity of DSM symptoms for depression and anxiety disorders during pregnancy. *J Affect Disorders* 2011 [In press].

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Correspondence to:
*Júlia Talabér
Faculty of Health Sciences
Semmelweis University
1088 Budapest, Vas street 17, Hungary
tel.: +36 20-268-68-91
e-mail: talaber.julia@se-etk.hu