EFFECTS OF ASSISTED REPRODUCTIVE TREATMENTS ON PREGNANT WOMEN'S MENTAL HEALTH

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

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

Summary
Introduction. Childbirth is one of the most important period in women's life. It gets an even bigger emphasis, if parents have to take some kind of assisted reproductive treatment for the conception. The number of cases when assisted reproductive treatments (ART) are used, is increasing, infertility affects 15-20% of couples. Premature birth and low birth weight is more frequent among pregnant women suffering from major depressive disorder (MDD). The literature does not have a uniform view on the mental health of artificially fertilized women.
Aim. The aim of our research is to submit and analyse particular mental health of women who become pregnant due to ART (ART group), and to compare ART group with spontaneously conceived group.
Material and methods. 985 pregnant women were examined between 01. October 2012 and 31. August 2013 at the 1st Department of Obstetrics and Gynaecology of Semmelweis University (Budapest, Hungary) with self-rated questionnaires.
We measured depression using EPDS test, the level of anxiety by the STAI test. We measured the quality of life with the WHO Quality of Life Bref questionnaire. We used our self-designed questionnaire to gather the socio-demographic data.
Results. 100 pregnant women out of 985 were conceived with help of the ART. The mean age was 35 years, their average gestational week was 32 weeks and about half of them (47%) had multiple pregnancy. 20.8% of the ART group reached the clinical level of depression, and 9% had a high anxiety level.
Conclusions. The frequency of mental disorders in the ART group does not show a big difference from the frequency of mental problems in case of spontaneously conceived group.

Key words: major depression disorder, anxiety, pregnancy, assisted reproductive treatments, mental health

INTRODUCTION

We talk about infertility, when no pregnancy occurs within a year in spite of regular, sexual life without contraception. Increasingly more couples have this problem nowadays: infertility affects 15-20% of couples (1).

Infertility in women can be caused by two main reasons: hormonal or organic abnormalities. Moreover, current health condition, lifestyle (especially smoking, and excessive alcohol consumption) or psychological factors also affect the development of infertility (2-4).

Infertile couples can choose from different forms of assisted reproductive technologies. Ovulation-induction, intrauterine insemination and in vitro fertilisation each belong to ART. In Hungary, 2% of all birth comes from ART pregnancies (5).

Pregnancy and depression

Major depressive disorder (MDD) is one of the most common psychiatric diseases. MDD's lifetime prevalence is between 8.3 and 24.2% (6). According to WHO's forecast by 2030 MDD will be the biggest economic burden for modern societies (7). Main symptoms of depression are depressed mood, decreasing ability of happiness, or in serious cases its full cessation (anhedonia). In addition, the typical symptoms are negative way of thinking, fatigue, low level of daily activities, decreased ability of concentration, decreased self-esteem, eating and sleeping disorders and suicidal symptoms. (DSM V) Depression is often associated with other psychiatric diseases most commonly with anxiety. 25-50% of patients suffering from depression have a suicide attempt at least one time, and 5-15% of them end their life with suicide (7).

Hormonal changes in a woman's life are vulnerable periods in the aspect of psychiatric morbidity. During perinatal period the appearance of depression is increased. Although 25-30% of pregnant women show depressive symptoms, the number of threated cases is much less (8).

Premature birth and low birth weight is more frequent among pregnant women suffering from MDD (9, 10). In case of newborn babies of depressed mothers it is statistically proven that sleeping disorders, crying and later behaviour and emotional disorders are more frequent (11).

According to the results of Repokari's et al. research anxiety level and appearance of depressive symptoms of ART women were lower than in the control group (12).

However, Monti et al. had a very different result: ART women had twice as many depressive points, than the spontaneously conceived group (13, 14).

In Hungary, Bödecs et al. performed a research among pregnant women in the first trimester. They also examined the connection between demographic data and the appearance of depression and anxiety. They found that 17.9% of the sample reached clinical level of depression, and 14.6% showed clinical level anxiety (15).

Research of mental status pregnant women taking ART in Hungary has not been performed yet.

In our study, we presumed that the mental status is worst in case of pregnant women who became pregnant due to ART (henceforth: ART group), than in the spontaneously conceived group (henceforth: spontaneous group). More studies confirm that pregnant women taking ART need to face more mental problems, which hardly ever appear in spontaneous pregnancies (13, 16-19).

In case of ART pregnancies we presumed that the quality of life is better, than in case of the spontaneous group because ART group planned the pregnancy, their partnership is stable, their life circumstances are more secure and their somatic health is more balanced.

We also presumed that within the ART group, in case of twin pregnancies there is a higher depression and anxiety level than in case of singleton pregnancies. Twin pregnancy itself is an endangered pregnancy (20, 21).

AIMS

The principal aim of our research is to submit and analyse particular mental health of the ART group, and to compare ART group with spontaneous group.

On the other hand our aim is also to ascertain, whether singleton or twin pregnancies within the ART group have an effect on mental health, especially on the appearance of the major depression.

MATERIAL AND METHODS

Our research is going on at the 1st Department of Obstetrics and Gynaecology of the Semmelweis University in Budapest, Hungary. Data gathering happened between 01. October 2012 and 31. August 2013. The whole sample included 985 pregnant women, who were between 22st and 40st gestational week. The participation was voluntary.

The mean age of our sample was 32.9 years and the average gestational week was 34.6 weeks. 91.0% lived in a relationship, 2.7% was divorced, and 6.3% was single.

According to the conception we compared two groups: ART group and spontaneous group. 885 women belong to spontaneous group and 100 women belong to ART group.

The mean age in the spontaneous group was 32.6 years. The average gestational week was 34.6 weeks. 86.7% of the spontaneous group lived in a relationship, 2.9% was divorced and 6.7% was single. In the spontaneous group 835 women had a singleton pregnancy, and 50 women had a multiple pregnancy.

The mean age of ART group was 35.2 years, average gestational week was 32.6 weeks. 98.0% of this group lived in a relationship, 1.0% was divorced and 1.0% was single.

In the ART group there were 47 multiple pregnancies out of the 100 pregnancy, therefore we examined this group separated to multiple and singleton pregnancies.

53 pregnant women belonged to singleton, ART group, their mean age was 35.6 years and the average gestational week was 34.8 weeks. 92.8% of this group lived in a relationship and 7.2% was single. 47 pregnant women belonged to multiple, ART group. Their mean age was 34.7 years, the average pregnancy period was 30.2 weeks. All members lived in a relationship (tab. 1).

Methods

We measured the mental state of pregnant women with standardized, validated self-rated scales, widely used in Hungary.

Table 1. Socio-demographic data of the total sample.

	Spontaneous group (n = 885)	ART group		
		Total (n = 100)	Singleton, ART group (n = 53)	Twin, ART group (n = 47)
Mean age (year)	32.6	35.2	35.6	34.7
Average pregnancy period (week)	34.6	32.6	34.8	30.2
Lived in a relationship (%)	86.7	98.0	92.8	100.0
Divorced (%)	2.9	1.0	0.0	0.0
Single (%)	6.7	1.0	7.2	0.0

We measured the level of depression with the Edinburgh Postnatal Depression Scale (EPDS). The questionnaire contains 10 items, the total score, (ranging from 0 to 30) is determined as the sum of the scores for each of the 10 items. The cut-off score was 9, implying that a woman reaching 9 points or above is likely to suffer from clinical level of depression (22).

We used the Spielberger State-Trait Anxiety Inventory questionnaires to measure anxiety. It has two parts. The State-part of the questionnaires shows 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. The cut-off point was 50, implying that 50 or more points indicate a clinical level of anxiety. The second part (Trait) shows the general level of anxiety, again with 20 questions, scores between 20 and 80, the cut-off score was 50 (23).

We measured the quality of life with the 26-item WHO Quality of Life Bref questionnaire. This is shortened version of the original 100-items questionnaire. Minimum 104, maximum 520 points could be reached. Higher scores shows better quality of life (24).

We used our self-designed questionnaire to collect the socio-demographic data.

Statistical analysis, we used Statistica 12 program, Chi^2 tests and multinomial logistic regression models.

RESULTS

We used statistical analysis to examine the relationship between socio-demographic data of ART group and spontaneous group. Using the Chi^2 test we found that 99.0% of the ART group lived in a relationship. This proportion is significantly higher than in the spontaneous group (p ≤ 0.000) Examining age ART group was significantly older than the spontaneous group (p ≤ 0.001) (tab. 2).

Table 2. Socio-demographic data of spontaneous and ART group.

	Spontaneous group (n = 885) %	ART group (n = 100) %
Marital status: in a relationship single	96.7 3.3	99.0* 1.0
Education: primary school high school university	6.4 22.3 69.3	1 18.7 80.3
Mean age (years)	32.6	35.2**

Chi^2 test: *p ≤ 0.000, **p ≤ 0.001

Spontaneous group

The clinical-level depression was measured by EPDS test, where the cut off score was 9. 24.5% of the spontaneous group showed clinical-level depression. Their average score was 5.9 on the EPDS. 11.6% of the group reached the clinical level of anxiety (≥ 50 points) and their average score was 35.6 points. The average score of WHO questionnaire was 409.3 points (tab. 3).

ART group

20.8% of the spontaneous group showed clinical-level depression. Their average score was 4.8 on the EPDS. 9.0% of the group reached the clinical level of anxiety (≥ 50 points) and their average score was 34.0 points. The average score of WHO questionnaire was 417.0 points (tab. 3).

Based on the examination of average depressive scores, presence of clinical-level depression and clinical-level anxiety and level of quality of life of spontaneous and ART group, we can say that the results of ART group were better.

Spontaneous and ART group's average depressive scores, presence of clinical-level depression and clinical-level anxiety and level of quality of life were compared with Chi^2 test. We found no significant difference between the two groups.

Result of singleton-ART and multiple-ART groups

We examined ART group separated to multiple and singleton pregnancies because of the big rate (47%) of the multiple pregnancies within the ART group.

16.7% of the singleton, ART group showed clinical-level depression (≥ 9 points), the average score on EPDS test was 4.3 points. 7.2% of this group signified

Table 3. The results of mental status of spontaneous and ART group.

	Spontaneous group (n = 885)	ART group (n = 100)
EPDS test		
Average score	5.9	4.8
Clinical-level depression ≥ 9 (%)	24.4	20.8
Current part of STAI test		
Average score	36.6	34.0
Clinical-level anxiety ≥ 50 (%)	11.6	9.0
WHO questionnaire		
Average score	409.3	417.0

Chi^2 test

clinical-level anxiety (≥ 50 points) in the actual part of STAI test the mean score was 33.0 points. In the case of the WHO questionnaire the group achieved an average of 417.0 points (tab. 4).

25.5% of multiple, ART group showed clinical-level depression (≥ 9 points). The average score of EPDS test was 5.3 points. 10.6% of the group reached points over the cut off value (≥ 50 points) in the current part of STAI test, and the average score was 35.9 points. The average score of WHO questionnaire was 415.0 points (tab. 4).

After examining the average depressive scores, presence of clinical-level depression and clinical-level anxiety and level of quality of life of ART group singleton and multiple pregnants, it is ascertainable that results of singleton, ART group were better in case of each value. Singleton, ART and multiple, ART group's average depressive scores, presence of clinical-level depression and clinical-level anxiety and level of quality of life were compared with Chi² test. We found no significant difference between the two groups.

We examined the effects of spontaneous conceiving and conceiving by ART and multiple pregnancies on clinical-level depression in multinomial logistic regression models. By analysing depressive values – dichotomized at the cut off point ≥ 9 – of ART singleton and multiple pregnancies in multinomial logistic regression models, we can see that multiple pregnancy and ART itself does not have significant effect on the development of clinical-level depression. But if there is a multiple pregnancy conceived by ART, it significantly raises the risk of the occurrence of the clinical-level depression (p ≤ 0.05) (tab. 5).

Table 4. The results of mental status of the singleton, ART and the multiple, ART groups.

	Singleton, ART group (n = 53)	Multiple, ART group (n = 47)
EPDS test		
Average score	4.3	5.3
Clinical-level depression ≥ 9 (%)	16.3	25.5
Current part of STAI test		
Average score	33.0	35.9
Clinical-level anxiety ≥ 50 (%)	7.2	10.6
WHO questionnaire		
Average score	419.5	415.0

Chi² test

Table 5. Results of analysis with multinomial regression model.

Multinomial regression model	Regression β coefficient	Level of significance
Spontaneous/ artificial	0.021	0.55
Multiple	-0.050	0.15
Spontaneous/ artificial X Multiple	0.068	0.05

DISCUSSION

We compared the mental status and quality of life of spontaneously conceived women to mental status of women who became pregnant after ART.

20.8% of the ART group suffered from clinical-level depression, 9.0% reached clinical-level anxiety, till the proportion of clinical level depression was 24.4% and clinical level anxiety 11.6% appeared in the spontaneous group. The ART group judged their quality of life a little bit better than the spontaneous group. According to the percental values the ART group angst less, are less depressed and their quality of life is better than the spontaneous group. Despite if this, during statistical analysis we found no significant difference between these two groups.

We also examined within ART group the multiple and singleton pregnancies. Rate of clinical-level depression was 25.5% in the multiple, ART group, till in cases of singleton, ART group this proportion was only 16.3%. Clinical-level anxiety in cases of multiple, ART group was 10.6%, in the singleton, ART group was 7.2%. The mental status of these two groups is also different: clinical-level depression and clinical-level anxiety is lower in the singleton, ART group than the multiple, ART group. But according to statistical analysis, this difference is not significant. The singleton, ART group judged their quality of life better than the multiple, ART group, but there is no significant difference.

According to analysis performed in the multinomial regression model clinical level depression appears more frequent in case of multiple pregnancies by ART than in singleton pregnancies by ART.

According to results of our research in the ART group in case of singleton pregnancy appearance of depression and anxiety is rarer than in the spontaneously conceived group. The cause of this can be different. Their social support is substantial and presumably their financial status is better. Because of this their pregnancy is not necessary to closely monitor and follow up their mental status.

The risk of evolution of clinical depression is significantly higher if there is a multiple pregnancy due to ART.

In conclusion, in case of multiple pregnancies by ART it is necessary closely following up the mental status of the pregnant women. It is also important to support the pregnant woman keeping her mental health both by the family and by the team of professionals who take care about the pregnancy. ☐

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Correspondence to:
*Zsófia Szemes
Department of Family Care Methodology
Institute of Health Promotion and Clinical Methodology
Faculty of Health Sciences
Semmelweis University
1088 Budapest, Vas street 17, Hungary
tel.: +36 305-457-181
e-mail: sophie0091@gmail.com