

Effects of psychological intervention and relevant influence factors on pregnant women undergoing interventional prenatal diagnosis

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Abstract

Background: This study aims to explore the effects of psychological intervention on eliminating anxiety and fear in pregnant women caused by interventional prenatal diagnosis, and the success rate of surgery.

Methods: A total of 100 pregnant women who scheduled for interventional prenatal diagnosis were included in this study, and were randomly divided into two groups: control group and intervention group. Women in the control group were given routine nursing care, and women in the intervention group were given psychological intervention in different stages of the operation. Psychological status were assessed by the symptom checklist-90 (SCL-90), self-rating anxiety scale (SAS), self-rating depression scale (SDS), and visual analogue scale (VAS). Furthermore, the success rate of surgery and the incidence of postoperative complications were tracked.

Results: Compared with the control group, the SCL-90 test scores of pregnant women in the intervention group were significantly lower in the following five factors: somatization, interpersonal sensitivity, depression, anxiety, and fear ($p < 0.05$). Furthermore, postoperative SAS, SDS, and VAS scores in the intervention group were significantly lower than in the control group; and the differences were statistically significant ($p < 0.01$).

Conclusion: Before pregnant women undergo interventional prenatal diagnosis, nurses should understand their psychological status and give psychological guidance in time, calm their anxiety, tension and fear, and help them build confidence to weather the pregnancy stages before and after the operation. This would improve the success rate of puncture and reduce the incidence of complications.

Keywords: Gestation; Invasive prenatal diagnosis; Psychological intervention

1. INTRODUCTION

Prenatal diagnosis refers to the detection and diagnosis of the development state of the embryo or fetus before birth, and the presence of diseases.¹ The prenatal diagnosis commonly used in clinic is amniotic puncture; that is, under the guidance of ultrasound, amniotic fluid is extracted for molecular genetics, cell genetics, and biochemistry assays. Since amniotic puncture is an invasive operation and the operated subjects have its particularity, combined with the risk of postoperative complications,² this operation brings very great psychological pressure to pregnant women.^{3,4} To improve the success rate of surgery, reduce the risk of postoperative complications, and relieve psychological problems such as anxiety and fear, in this study, 100 pregnant women who underwent amniotic puncture received

preoperative psychological investigation and intraoperative psychological counseling, so as to explore the effects of psychological intervention on removing the bad mood of pregnant women, improve prenatal diagnosis success rate, and reduce the incidence of postoperative complications. Related influence factors were analyzed. Details are reported as follows.

2. METHODS

2.1. Subjects

From June 2012 to June 2014, a total of 100 pregnant women who underwent prenatal screening in the Outpatient Department of our hospital and received amniotic puncture were included in this study. These women were divided into two groups, based on when the prenatal screening was conducted: intervention group (single week) and control group (double week). In the intervention group, 48 women underwent prenatal screening in a single week; and the age of these women ranged from 21 to 38 years old, with an average age of 26.9 ± 1.5 years old. Among these women, 13 women had an educational level of junior high school and below, 18 women had an educational level of high school, and 17 women had an educational level of university or above. The mean gestational week was 16.0 ± 0.4 weeks. In the control group, 52 women underwent prenatal screening in a double week; and the age of these women ranged from 20 to 40 years old, with an average age of 27.5 ± 1.4 years old. Among these women, 12 women had an educational level of junior high

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school and below, 19 women had an educational level of high school, and 20 women had an educational level of university or above. The mean gestational week was 16.0 ± 0.5 weeks. Differences in general data between these two groups were not statistically significant ($p > 0.05$).

2.2. Methods

2.2.1. Evaluation tools

(1) General situation questionnaire: mainly includes age, nationality, occupation, educational level, and gestational week. (2) Symptom checklist-90 (SCL-90):⁵ consists of 90 items, including somatization, forcing, interpersonal sensitivity, depression, anxiety, hostility, terror, paranoia, psychosis, and 10 other symptom factors. Five-score method (0-4) was adopted. The higher the score was, the more obvious the symptoms became. (3) Self-rating anxiety scale (SAS):⁶ this scale includes 20 items that rated anxiety into 1-4 levels, according to the conditions. The higher the score was, the heavier the anxiety level became. (4) Self-rating depression scale (SDS):⁷ this scale includes 20 items, which rates mood into 1-4 levels, according to the conditions. The higher the score was, the heavier the depression level became. (5) Visual analog scale (VAS): although VAS is more frequently used as a method of assessment of pain and anxiety, studies have shown that it is also effective in fear evaluation.^{8,9} Pregnant women estimated their fears, and the estimated scores ranged between 0 and 100 points. A higher score suggests more intense fear. (6) Amniotic puncture cognitive questionnaire: by reading literature, combined with expert guidance, the questionnaire was designed by the researchers themselves. The questionnaire includes 10 items, in which one point was given for each correct answer, and no point was given for a wrong answer. The sum of the scores for each item is the total score. The higher the score was, the better they were able to master of the knowledge of amniotic puncture.

2.2.2. Psychological intervention contents

(1) Age, educational level, occupation, and gestational age these of pregnant women were investigated by the general situation questionnaire before the operation. Depression, anxiety, fear, and other psychological status of these pregnant women were assessed by the SCL-90 questionnaire. All pregnant women underwent routine examinations, and blood pressure, pulse, fetal cardiac activity, and others factors were recorded in detail. (2) Health education was provided for the pregnant woman in the intervention group using images, animation, and other forms of media, enabling them to understand the necessity of amniotic puncture and related knowledge. The adverse effects of preoperative anxiety, depression, and fear on amniotic puncture were explained; and individualized guidance and help were provided for pregnant women with serious anxiety, depression, and fear. At least one member of the patient's family was required to attend the health education. (3) After the operation, care should continue to be provided by nurses and family members, enabling the psychological intervention to continue.

2.2.3. Psychological intervention methods intervention group

(1) Preoperative intervention: (A) psychological support: nurses patiently and carefully talked to the pregnant women, carefully listened to them with enthusiasm, clearly explained the knowledge of the puncture, provided scientific explanation to their inner doubts, and tried to increase the trust of the pregnant women, in order to ease their tension. (B) Introducing the procedure: nurses explained the process and security of the operation to the pregnant women before surgery, explained the

performance of intraoperative and postoperative normal reaction, possible discomfort and precautions, and introduced the technical level of the surgeons, to eliminate their inner concerns. For pregnant women with high anxiety, nurses should carefully understand the source of their bad mood, provide psychological counseling, and help them build up confidence with the assistance of family affection and mental comfort, to calm their moods down and accept the puncture as soon as possible. (C) Relaxation training: under the background of soothing music, pregnant women underwent systemic muscle relaxation training in a sitting or lying position, which was guided three to five times repeatedly, until the pregnant women could conduct these by themselves. (D) Family support: surgery significance, methods, and postoperative nursing knowledge were explained to a pregnant woman's family, especially by her husband; and guided them on how to concern, support and help pregnant women in all aspects. (2) Intraoperative intervention: (A) during the operation, a nurse stood beside the pregnant woman, slightly held the hands of the pregnant women, or touched their upper arms, giving her psychological support, and reducing her tension mood. (B) During the process of the operation, pregnant women wore headphones, in which a light soothing music was played at a comfortable volume until the end of the surgery. (3) Postoperative intervention: after the surgery, nurses assisted the pregnant women to walk back to their room for observation and rest, and guided the family to continue to give concern. Control group: general health education was provided, related knowledge and operation process were explained to the pregnant women, and a normal operation was provided.

2.2.4. Survey method and timing

The study objective was to explain to the research subjects. After obtaining an informed consent, under the guidance of doctors, the questionnaire was filled up by the pregnant women themselves. The general situation questionnaire and the amniotic puncture cognitive questionnaire should be filled up only once before the operation, while the SCL-90, SAS, and SDS questionnaires should be completed twice: one before the operation and psychological intervention and one after the operation. The VAS questionnaire was filled up during the operation.

2.3. Statistical methods

Data were statistical analyzed using statistical software SPSS 16.0. Count data were compared using χ^2 test. Measurement data were expressed as mean \pm SD, and were compared using t test. Test level was $\alpha = 0.05$.

3. RESULTS

3.1. Comparison of SCL-90 scores between the two groups before and after intervention

The total score of SCL-90 and the Scores of somatization, depression, and anxiety were significantly ($p < 0.05$) decreased after the psychological interventions in pregnant women in the intervention group, and all the five scores in the intervention group were lower ($p < 0.05$) than the control group. Details are shown in Table 1.

3.2. Comparison of SAS and SDS scores between the two groups before and after intervention

An SAS score >50 points and SDS score >53 points was set as the standard line. The incidence of anxiety and depression in these two groups of pregnant women were 27.6% and 13.9%, respectively. Before intervention, differences in anxiety, depression, and fear levels between these two groups were not

Table 1**Two groups of pregnant women before and after intervention SCL-90 Score comparison (mark, $\bar{x} \pm s$)**

Group	SCL-90 divide the total	Somatization	Force	Sensitive of interpersonal relationship	Depression, r	Anxiety
Intervention group (n = 48)						
Before the intervention	1.67 ± 0.58	1.49 ± 0.42	1.76 ± 0.69	1.80 ± 0.69	1.70 ± 0.71	1.61 ± 0.50
After the intervention	1.30 ± 0.37 [△]	1.20 ± 0.39 [△]	1.40 ± 0.56 [△]	1.29 ± 0.60 [△]	1.43 ± 0.45 [△]	1.24 ± 0.53 [△]
Control group (n = 52)						
Before the intervention	1.62 ± 0.51	1.53 ± 0.41	1.78 ± 0.48	1.80 ± 0.59	1.69 ± 0.58	1.55 ± 0.43
After the intervention	1.55 ± 0.43	1.49 ± 0.37	1.76 ± 0.43	1.79 ± 0.54	1.63 ± 0.45	1.53 ± 0.42

Note: Comparison in the group, * $p < 0.05$; Compared with the control group, [△] $p < 0.05$. SCL-90 = symptom checklist-90.

Table 2**Two groups of pregnant women before and after intervention SAS Score comparison (Score, $\bar{x} \pm s$)**

Group	n	SDS		SAS	
		Before the intervention	After the intervention	Before the intervention	After the intervention
Intervention group	48	44.69 ± 8.39 [△]	35.58 ± 8.37 [△]	46.91 ± 8.56	39.32 ± 9.58 [△]
The control group	52	44.12 ± 7.15	42.80 ± 9.29	47.23 ± 7.98	46.10 ± 9.23

Note: Comparison in the group, * $p < 0.05$; Compared with the control group, [△] $p < 0.05$. SAS = self-rating anxiety scale; SDS = self-rating depression scale.

Table 3**Two groups of pregnant women in pain score comparison**

Group	Preoperation	Postoperation
Intervention group	42.9 ± 11.9	32.7 ± 11.7 [△]
Control group	44.4 ± 11.4	38.4 ± 11.9 [*]

Note: Comparison in the group, * $p < 0.05$; Compared with the control group, [△] $p < 0.05$.

statistically significant ($p > 0.05$). Postoperative SAS and SDS scores were significantly lower in the intervention group than in the control group, and the differences were statistically significant ($p < 0.01$). In the control group, differences in anxiety, depression, and fear levels were not statistically significant between preoperation and postoperation ($p > 0.05$). Details are shown in Table 2.

3.3. The comparison of VAS scores between the two groups

As depicted in Table 3, there was a trend of declination of VAS scores after the procedure (both in intervention and control groups). However, when psychological intervention is performed, the difference was even more obvious ($p < 0.05$).

3.4. Comparison of success rate between groups

The success rate of punctation is higher in intervention group when compared to control group ($p = 0.04$). In addition, duration of the procedure is shorter in intervention group ($p = 0.03$).

4. DISCUSSION

In the physiological process of pregnancy, in addition to physical appearance changes, changes in a woman's endocrine level and mental state are also very obvious.^{10,11} Particularly, interventional prenatal diagnosis has certain risks to pregnant women and the fetus, such as abortion, infection, and the premature rupture of membranes.¹² Furthermore, women who need this operation are under different levels of pressure and fear in psychology,

physiology, and social environment. Pregnant women suffer agonies due to these pressures, which affect the operation process and the incidence of postoperative complications.^{4,13} Therefore, when communicating with pregnant women and implementing the doctor's advice, nurses need to understand their psychological state, provide psychological counseling in a timely manner, help them eliminate the influence of bad feelings, and build up confidence to weather the pregnancy stages before and after the operation.¹⁴

In this study, five factors in the SCL-90 questionnaire, namely, somatization, depression, anxiety, forcing and interpersonal sensitivity were significantly higher in the two groups of pregnant women than in the previous studies.^{15,16} After psychological intervention, the score of each factor in pregnant women in the intervention group significantly decreased; while these scores did not significantly decrease in the control group. In addition, the incidence of anxiety and depression in these two groups of pregnant women were 27.6% and 13.9%, respectively; which were higher than those reported in previous studies.^{17,18} Before intervention, differences in anxiety, depression, and fear levels between these two groups were not statistically significant ($p > 0.05$); and after psychological intervention, SAS, SDS, and VAS scores significantly decreased and became lower than that in the control group. Furthermore, these decline rates were significantly higher than in the control group. It was reported in a previous literature that a pregnant woman's anxiety and depression is associated with their health care knowledge during pregnancy.¹⁹ Compared with normal pregnant women, pregnant women who underwent prenatal interventional diagnosis have higher psychological pressure.⁴ In addition, due to the specificity of medicine, most pregnant women have certain misunderstandings on amniotic puncture.³ Through the amniotic puncture cognitive questionnaire survey, it was found that the main problems that induce anxiety, depression, and fear in pregnant women included the following: whether the operation would endanger fetal development, whether the operation would induce abortion, and whether the operation would cause intrauterine infections.^{3,4} Based on the understanding of these psychological activities in pregnant women, maternity nurses should observe

the patient's conditions from the psychological and physical aspects, with good psychological quality. Sincere concern and abundant professional knowledge help pregnant women establish confidence, overcome fear and anxiety; and it also help them better weather the pregnancy stages before and after the operation. Psychological nursing in obstetrics and gynecology refers to the opposition to existing and potential maternal psychological problems, psychological needs, and psychological state. With knowledge on medical psychology, scientific attitude and appropriate methods, nursing personnel can manage a patient's psychological concerns, mental anguish, difficult problems, and thought burden, in order to meet the various requirements of these pregnant women, and solve their psychological problems. In this study, the integrated use of psychological intervention measures such as health education, music therapy, psychological support, and relaxation training reduced the degree of maternal anxiety and improved their stress ability, enabling the amniotic puncture operation to be carried out smoothly. Also, the success rate of puncture is significantly improved after psychological interventions, which can be attributed to improved compliance in these patients. Health education was also carried out for pregnant women before the operation, in which the amniotic puncture process and precautions were explained. Pregnant women receive psychological support through language communication; thus, their anxiety, depression, and fear degrees were reduced. Through the relaxation of the whole body muscles, the addition of the use of relaxation training reduced anxiety and tension. During the operation, nurses gently held the pregnant women's hands or touched their arms, and played slow and melodious music. These tactile and auditory signals transmitted to the brain cortex produced good effects on the central nervous system, and effectively alleviated the tension and anxiety of pregnant women.

In conclusion, in this study, the anxiety, depression, and fear of the pregnant women who underwent amniotic puncture were intervened by comprehensive psychological interventions. These results revealed that psychological intervention could achieve the purpose of relieving anxiety, depression, and fear caused by the arrival of interventional prenatal diagnosis. Among these measures, health education, music therapy, psychological support, and relaxation training have exhibited good effects. The physical and psychological double care of nurses, as well as being accompanied by their family and family support, could help relieve anxiety, tension, and fear among pregnant women, improve the success rate of the surgery, and reduce the risk of complications.

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