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Cognitive Impairment in Pregnant Women with Autonomic Nervous System Dysregulation.

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ABSTRACT

Women frequently report cognitive impairment during pregnancy. The aim of the research is to carry out the analysis of cognitive impairments in pregnant women with autonomic nervous system dysregulation. 19 pregnant women with autonomic nervous system dysregulation (the basic group) and 16 pregnant women without neurologic pathology (the control group) were examined. Neuropsychological tests such as Montreal Cognitive Assessment test (MoCA test) and concentration test by the method of Münsterberg were applied for investigation of cognitive impairment. Depression screening test – Depression scale (CES-D) was applied to determine depressive disorder among pregnant women. Statistica 8.0, Microsoft Excel were used for data processing. The research showed the decrease of the short-term memory, decreased concentration, the impairment of extended memory reproduction and abstract thinking in pregnant women with autonomic nervous system dysregulation. Depressive disorder was met in pregnant women in both groups. The majority of women with depressive disorder were found in pregnant women with autonomic nervous system dysregulation. All pregnant women with autonomic nervous system dysregulation had cognitive impairment (100%). It was detected 2 times more often than in a control group

Key words: cognitive impairment, pregnant women, autonomic nervous system dysregulation

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INTRODUCTION

The data of multiple epidemiological analysis estimates that, worldwide, approximately 80% people have autonomic nervous system dysregulation. It is one of the causes of cognitive impairment. Autonomic nervous system dysregulation includes all forms of vegetative regulation abnormality such as vegetative crisis, lingering subfebrile conditions, neurogenic syncope, vascular-trophic local syndromes, orthostatic hypotension, anhidrosis, Neurogenic bladder dysfunction. [1] Pregnancy with autonomic nervous system dysregulation deteriorates by enhancing such clinical syndromes as respiratory, asthenic, hemorrhagic, aggravating peripheral vascular disorders.

Women with vegetative regulation abnormality develop gestosis, placental insufficiency, have spontaneous abortions. Neonates have abnormal neonatal adaptation. In spite of enhanced clinical symptoms, pregnancy for patients with autonomic nervous system dysregulation is not contraindicated. [2] Cognitive functions are the most difficult brain functions which realize the world rational perception, cognition process. These functions include memory, gnosis, speech, praxis and mentality.[3]Cognitive impairment is frequent in pregnancy and it is coupled with a range of undesirable outcomes, including maternal death.[4] The pregnancy-induced deficit that is associated with working memory is less than the pregnancy-induced deficit in general cognitive processing, which suggests that working memory tasks are not especially likely to show a pregnancy-induced deficit, but may instead be related to a subtle and overall cognitive impairment related to pregnancy. [5]

The aim of the research is to carry out the analysis of cognitive impairments in pregnant women with autonomic nervous system dysregulation.

This investigation is focused on solving the following problems:

1. To figure out the prevalence of cognitive impairment among pregnant women with autonomic nervous system dysregulation ;
2. To determine what cognitive impairments are -typical for pregnant women with autonomic nervous system dysregulation;
3. To reveal the prevalence of depressive disorder among pregnant women with autonomic nervous system dysregulation.

MATERIALS AND METHODS

The authors examined 48 women in Perm Clinical Perinatal Center during investigation. 19 pregnant women with autonomic nervous system dysregulation (the basic group) and 16 pregnant women without neurologic pathology (the control group) were investigated. Both groups were equal in the age, educational level, duration of gestation.

Entry criteria

- Women in the third trimester of pregnancy;
- Age - 19-35 years old;
- Higher or incomplete higher education of the participants
- Informed consent

13 Participants were excluded.

Excluded criteria

- Extragenital pathology among pregnant women;
- Multiple pregnancy;
- Preeclampsia.

The neurologic physical examination for neurologic pathology detection was used in both groups during investigation. Neuropsychological tests were applied in the research. The Montreal Cognitive Assessment test (MoCA test) was realized for cognitive sphere assessment to study attention, concentration, memory, visuo-constructive abilities, executive functions, language, abstract thinking, counting and orientation. Test concentration by the method of Münsterberg was used to examine the level of concentration. According to this test the man behind two minutes should be found in a long passage, consisting exclusively of letters, as many words. Found words to emphasize the need to pencil. The text contained twenty-three encrypted words. If the test in two minutes found fewer words, it meant the level of concentration was unsatisfactory, if more - great.

Depression screening test – Depression scale (CES-D) was applied to determine depressive disorder in pregnant women. CES-D test - a type of self-administered test that aims to measure the level of the patient's depressive feelings and behavior. Microsoft Excel, Statistica 8.0. were used for data processing.

RESULTS AND DISCUSSION

The statistical data manipulation showed that 19 pregnant women out of 48 had autonomic nervous system dysregulation (39,58 %). The majority of pregnant women in this investigation (77%) had abnormalities in cognitive sphere. The decrease of cognitive functions was typical for all pregnant women in the basic group (19 women). Among pregnant women in both groups below the average attention stability was met in 23 women (65,7%), low attention stability took place in 8 women (22,8%) and the average attention stability in 4 women (11,4%). 7 Pregnant women (30,4%) with below the average attention stability and 3 women (37,5%) with a low attention stability were representatives of the basic group. There was no autonomic nervous system dysregulation among pregnant women with the average attention stability. It is necessary to notice that depressive disorder was founded in 6 pregnant women in both groups (17%). The majority of them had autonomic nervous system dysregulation (66,6%). Table 1 showed the main differences in the basic and in the control groups. Table 2 focused on the correlation between cognitive impairment and women with vegetative regulation abnormality.

Table 1: Differences of the main and control groups in various criteria

Comparative criteria	All women under study	Women with autonomic nervous system dysregulation	Cognitive impairment	Depressive disorder
The main group	19	19	19	4
The control group	16	0	8	2

Table 2: Correlation between cognitive impairment and autonomic nervous system dysregulation (n=19)

Cognitive impairment	Spearman rank correlation coefficient
Short-term memory	0,99
The low attention stability	0,99
The extended memory reproduction	0,99
Abstract thinking	0,99

CONCLUSION

Pregnancy, childbirth, and early motherhood physiologically and psychologically affect a woman's cognitive parameters.[4] Pregnant women with cognitive impairment, mild to severe, are at increased risk for spontaneous abortion, preterm labor and for having a growth-retarded baby.[4] Women frequently report cognitive impairment during pregnancy. There is a stereotype of cognitive impairment in pregnancy and while there is no evidence for a pervasive deterioration in cognitive ability, there may be changes in some specific aspects of cognitive processing. [6]

In our research we found that:

- All pregnant women with autonomic nervous system dysregulation had cognitive impairment (100%, 19 women). It was founded in 2.3 times more often than in a control group (42%, 8 women).
- The short-term memory decrease ($R=0,99$, $p<0,05$), the low attention stability ($R=0,99$, $p<0,05$), the impairment of extended memory reproduction ($R=0,99$, $p<0,05$) and abstract thinking ($R=0,99$, $p<0,05$) were founded in pregnant women with autonomic nervous system dysregulation.
- Exploratory analyses showed that, the majority of depressed participants, was found in the basic group ($R=0,95$, $p<0,05$).

Management of pregnancy in women with autonomic nervous system dysregulation should be conducted by an obstetrician together with a neurologist for making the pregnancy course and outcome successful for woman and her child.

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