

ORIGINAL ARTICLE

Cognitive disorders in pregnant women with a malfunction of the autonomic nervous system

Elena ALESHINA¹, Vera CHERKASOVA², Vladimir CHEREMISKIN³

¹ Municipal Central Children Clinical Hospital №15, Perm, ² Department of Medical Rehabilitation and Sport Medicine, Perm State Medical University, Cognitive Dysfunctions Center, Perm, ³ Perm Clinical Perinatal Center, Perm, Russia.

Correspondence to: Aleshina Elena, neurologist, Municipal Central Children Clinical Hospital №15, 614066 Russian Federation, Permsky region, Perm city, Stahanovskaya 45b st.-20; TEL +79028304466; E-MAIL: aleshina.helena@gmail.com

Submitted: 2015-02-14 *Accepted:* 2015-03-10 *Published online:* 2015-04-01

Key words: **cognitive disorder; pregnant women; autonomic nervous system**

Act Nerv Super Rediviva 2015; 57(1–2): 3–5

ANSR571215A01

© 2015 Act Nerv Super Rediviva

Abstract

BACKGROUND: Pregnancy with malfunction of the autonomic nervous system deteriorates by enhancing such clinical syndromes as respiratory, asthenic, hemorrhagic, aggravating peripheral vascular disorders. Cognitive disorder is frequent in pregnancy and it is coupled with a range of undesirable outcomes, including maternal death.

AIM: To carry out the analysis of cognitive disorders in pregnant women with a malfunction of the autonomic nervous system.

METHODS AND MATERIAL: 19 pregnant women with the malfunction of the autonomic nervous system (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 disorder. Depression screening test – Depression scale (CES-D) was applied to determine depressive disorder among pregnant women.

STATISTICAL ANALYSIS USED: Statistica 8.0, Microsoft Excel were used for data processing.

RESULTS: 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 the malfunction of the autonomic nervous system. Depressive disorder was met in pregnant women in both groups.

CONCLUSIONS: All pregnant women with the malfunction of the autonomic nervous system had cognitive disorders (100%). The majority of women with depressive disorder was found in group of pregnant women with the malfunction of the autonomic nervous system.

INTRODUCTION

The data of multiple epidemiological analysis estimates that, worldwide, approximately 80% people have a malfunction of the autonomic nervous system. It is one of the causes of cognitive disorders. The malfunction of the autonomic nervous system 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 (Vein 2003). Pregnancy with the malfunction of the autonomic nervous system 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 the malfunction of the autonomic nervous system is not contraindicated (Makolkin *et al* 2007). 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 (Zaharov 2005). Cognitive disorder is frequent in pregnancy and it is coupled with a range of undesirable outcomes, including maternal death (Nagananda *et al* 2012). 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 (Anderson & Rutherford 2012).

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

This investigation is focused on solving the following problems:

1. To figure out the prevalence of cognitive disorders in pregnant women with the malfunction of the autonomic nervous system;
2. To determine what cognitive disorders are typical for pregnant women with the malfunction of the autonomic nervous system;
3. To reveal the prevalence of depressive disorder among pregnant women with the malfunction of the autonomic nervous system.

METHODS

The authors examined 48 women in Perm Clinical Perinatal Center during investigation. 19 pregnant women with the malfunction of the autonomic nervous system (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

The statistical data manipulation showed that 19 pregnant women out of 48 had the malfunction of the autonomic nervous system (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 malfunction of the autonomic nervous system among pregnant women with the average attention stability. It is necessary to notice that depressive disorder was found in 6 pregnant women in both groups (17%). The majority of them had a malfunction of the autonomic nervous system.

Tab. 1. Differences of the main and control groups in various criteria.

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

(66.6%). Table 1 showed the main differences in the basic and in the control groups.

DISCUSSION

Pregnancy, childbirth, and early motherhood physiologically and psychologically affect a woman's cognitive parameters. Pregnant women with cognitive impairment, mild to severe, are at increased risk for spontaneous abortion, preterm labor and for having a growth-retarded baby (Nagananda *et al* 2012). 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 (Crawley 2006).

In our research we found that:

All pregnant women with the malfunction of the autonomic nervous system had cognitive disorders (100%, 19 women). It was found 2 times more often than in a control group (42%, 8 women).

The short-term memory decrease ($R=0.99$, $p<0.05$), the low concentration ($R=0.99$, $p<0.05$), the impairment of extended memory reproduction ($R=0.99$, $p<0.05$) and abstract thinking ($R=0.99$, $p<0.05$) were found in pregnant women with the malfunction of the autonomic nervous system.

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

Conflict of Interest Statement: *The authors have no financial conflicts of interest.*

REFERENCES

- 1 Anderson MV & Rutherford MD (2012) Cognitive reorganization during pregnancy and the postpartum period: an evolutionary perspective. *Evol Psychol.* **10**(4): 659–687.
- 2 Crawley R (2006) Cognitive changes in pregnancy: Real or mythical? University of Sunderland, May 3rd, 2006.
- 3 Makolkin VI, Kozinova OV, Ishchenko AI (2007) Specific course of neurocirculatory dystonia in pregnancy. *Ter Arkh.* **79**(12): 55–57.
- 4 Nagananda MS, Sengupta A, Rehman SMK, Santhosh J, Anand S (2012) Identifying prospective biomarkers for cognitive impairments during pregnancy – review of current status and some preliminary results. *Gynecol Obstetric.* **S8**:001. doi:10.4172/2161-0932.S8-001.
- 5 Vein AM (2003) Vegetative dysfunctions: Clinics, diagnostics, treatment. Moscow, 109p.
- 6 Zaharov VV (2005) Cognitive disorders in neurology practice. *A Difficult Patient.* No. 5, <http://www.t-patient.ru/archive/n5-2005/n5-2005—23.html>.