

Short Communication

Pregnancy and exogenous constitutional obesity. possibilities of ozone therapy

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Abstract

The aim of the study was to evaluate ozone therapy in obese pregnant women. 118 pregnant women with varying degrees of obesity were examined and treated. It turned out that the course of intravenous drip administration of ozonated saline solution leads to the normalization of a number of important indicators of homeostasis including stimulation of the antioxidant system and reduction of peroxide stress. The reduction in the frequency of miscarriage, preeclampsia, premature birth, and bleeding during childbirth and the postpartum period is achieved.

It's possible to recommend the inclusion of ozone therapy in the preventive treatment of pregnant women with exogenous constitutional obesity.

More Information

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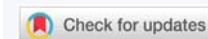
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Introduction

Obesity is one of the most common forms of disorders of fat metabolism, this disease is a serious medical, social, and economic problem [1,2]. The frequency of obesity in the structure of the overall morbidity is exceptionally high and varies between 15% and 45%, in the USA, 2011–2012 NHANES (National Health and Nutrition Examination Survey) data indicate that the prevalence of obesity in women aged 20–39 years is at least 31.8% and is even higher in women of low incomes at 61% [3]. The global prevalence of overweight and obesity in pregnancy is rising and this represents a significant challenge for the management of pregnancy and delivery. Women who have a pre-pregnancy body mass index greater than 25 kg m⁻² are more likely than those with a body mass index in the ideal range (20-24.99 kg m⁻²) to have problems conceiving a child and are at greater risk of complications during pregnancy (including miscarriage, preeclampsia), childbirth and the postpartum period [4-6].

The purpose of the study

To identify the effect of medical ozone on the course of pregnancy, childbirth, and the postpartum period in women with exogenous constitutional obesity and to evaluate a new treatment method using ozone therapy in order to increase the effectiveness of prevention of complications of the gestational process in overweight pregnant women.

Materials and methods of research

A dynamic examination of 118 pregnant women with exogenous constitutional obesity was carried out, of which 71 received medical ozone as part of complex treatment, and 47 received traditional therapy. The patients were divided into 3 groups depending on the severity of obesity: group 1 - patients with a mild form of the disease (42 women); group 2 - patients with obesity of II degree (44 women); group 3 - patients with obesity of III-IV degree (32 women). Spontaneous miscarriages in pregnant women of group 1 were 1.5 - 1.7 times less common than in patients of groups 2 and 3. It should also be noted that in women with obesity of II and III severity, spontaneous abortions prevailed up to 12 weeks of pregnancy. In general, 40% of women in the first, 60% of the second, and 70% of the third groups had a burdened obstetric and gynecological history.

In a significant part of the patients, the course of the present pregnancy was also complicated. Preeclampsia developed most often, and the frequency of this complication directly depended on the degree of obesity. Thus, in patients of group 1, preeclampsia was observed 2.4 times less often than in pregnant women of group 3. Threatening miscarriage in women with grade I obesity was found in 26.2%, threatening premature birth in 9.5%, and overexposure in 14.3% of cases. These complications were noted in group 2, respectively,

in 25%, 11.4% and 20.4% and in group 3 - in 21.9%, 18.8% and 23.3% of cases. Within each of the groups, depending on the method of treatment, the main (using ozone therapy) and control (using traditional therapy) subgroups were determined. Ozone therapy was carried out in the form of a daily intravenous drip of the ozonated saline solution obtained using a saturating concentration of ozone 400 micrograms / l in an ozone-oxygen mixture at the outlet of the ozonator ("Medozons - BM") in an amount of 400 ml. The course of treatment was 5 days. Thus, the differences in the subgroups were determined by the presence or absence of ozone therapy in the complex treatment. A comprehensive dynamic clinical observation was carried out for all pregnant women, lipid peroxidation indicators (LP), the activity of the antioxidant defense system (AOS), the lipid spectrum of blood serum and coagulogram were studied, and the hormone-producing function of the fetoplacental complex and dopplerometric studies of uteroplacental and fetoplacental blood flow were evaluated.

The processing of the obtained data was carried out using the Microsoft Excel software product using methods of variational statistics and correlation analysis. The samples were checked for the normality of the distribution. The Student's method was used to prove the validity of the difference between the samples. Two samples were considered to belong to different general populations at $p < 0.05$.

Results and discussions

In patients treated with ozone, a decrease in the blood level of LP and an increase in the activity of AOS enzymes were found, which was proved by a decrease in the level of primary and final molecular products of lipoperoxidation - diene conjugates and Schiff bases, as well as an increase in I_{\max}/S according to induced biochemiluminescence. Under the influence of ozone therapy, there was a decrease in the blood content of total lipids, low-density lipoproteins, and, accordingly, the atherogenicity coefficient (a decrease in initially elevated levels of total cholesterol, β -lipoproteins, and triglycerides). In pregnant women with a tendency to hypercoagulation after treatment, normalization of coagulogram parameters (activated partial thromboplastin time), activated recalcification time, and prothrombin index), a decrease in the initially elevated fibrinogen level was noted. In addition, an improvement in the state of uteroplacental blood flow was revealed.

Ozone therapy initially applied in medicine by an empirical approach, has now reached a new stage where most of the biological mechanisms of ozone action have been clarified, which refers to antimicrobial effects, immunoregulation, antioxidant defenses and epigenetic modification [7-9]. In our opinion, it is the ability to correct peroxide stress that is the basis of numerous therapeutic effects of ozone. The data obtained by us correlate with some published results.

In particular, studies using ozone therapy for the prevention and/or treatment of toxicity caused by chemotherapy and how its effect is associated with the modification of free radicals and antioxidants are described [10,11].

When analyzing the further course of the gestational process, it was found that the use of ozone therapy in patients with obesity of I and II severity can significantly reduce the risk of developing preeclampsia. Thus, in group 2 patients treated with ozone, this pathology was almost 1.4 times less common than in the control, while pregnant women receiving ozone therapy did not have a single severe case of the disease, while preeclampsia of moderate severity developed 2.2 times less often than in women receiving traditional treatment. When studying the effect of ozone therapy on the frequency of threatening premature birth, it was found that in pregnant women with obesity of I - II degree, this complication was almost one and a half times less common than in patients treated without the use of ozone. Also, when comparing the results of therapy in the main and control subgroups, it was found that pregnant women of group 1 who received medical ozone as part of treatment were 1.4 times less likely to suffer from anemia later. According to our observations, one of the most frequent complications of pregnancy in overweight women - overeating - occurred in patients treated with ozone in significantly fewer cases.

When analyzing the course of labor, it turned out that in patients of all three groups receiving ozone therapy, weakness of labor activity was observed 1.6 - 1.7 times less often than in control patients. Special attention should be paid to the fact that pregnant women with obesity of II degrees against the background of ozone treatment were 1.5 times less likely to experience bleeding in the III periods of labor and in the early postpartum period.

It should be emphasized that in women of groups 1 and 2 treated with ozone, a caesarean section was performed 2.1 times less often than in women of the control subgroup.

We believe that the identified effects of ozone will be useful in the treatment of various pregnancy complications and will expand the existing list of indications for ozone therapy [12].

Conclusion

It was found that the most pronounced beneficial effect of ozone on the clinical course of pregnancy and childbirth, as well as homeostatic indicators of the body, is observed when using ozone therapy in pregnant women with obesity of I - II degree, however, positive changes in the lipoperoxidation system, lipid metabolism, hemorheological parameters, uteroplacental blood flow, occurring under the influence of medical ozone in the group patients with obesity of III-IV degree, do not give grounds to refuse ozone therapy in this contingent of patients.



The results obtained made it possible to recommend the inclusion of ozone therapy in the preventive treatment of pregnant women with exogenous constitutional obesity.

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