**Journal of Advanced Medical and Dental Sciences Research**

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

# Original Research

## Optimization of methods for prevention and intensive therapy of complications in pregnant women with chronic syndrome of Disseminated Intravascular Coagulation

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***ABSTRACT:***
In order to develop preventive intensive care methods that ensure safe delivery in women with chronic disseminated intravascular coagulation syndrome and thus have a beneficial effect on the condition of the mother and fetus, we analyzed exchange cards and the birth history of 45 pregnant women. All pregnant women underwent intensive therapy including β-blockers (atenalol, bisoprolol, metaprolol), Ca antagonists (nifedipine, amlodipine, corinfar), magnesium therapy, neurometabolic protection if necessary, as well as infusion therapy (refortan, stabizol, etc.). Pregnant women of the main group received enoxaparin and heparin in a complex of intensive care. All patients showed a decrease in platelet count by 44%, a decrease in prothrombin index by 47%, prolongation of prothrombin time, clotting time, and an increase in hemoglobin values by 27%. In all pregnant women, the coagulogram was studied in stages: before delivery, day 1, day 3 and day 5. According to the literature and our research, in the third trimester during physiological pregnancy, there is an increase in the total activity of blood coagulation factors that make up the internal pathway of hemostasis activation - VIII, IX, X, XI, XII. All patients underwent elective delivery. In 6 patients (26%) of the main group, the clotting time was lengthened by 34% during the genus, in the rest of the patients it did not change. No complications were observed during childbirth and early postpartum. The use of enoxaparin and heparin in a complex of intensive therapy reduces the risk of developing fatal complications, disseminated intravascular coagulation of the syndrome in risk groups of pregnant women, and also improves indicators of the quality of life of the mother and the condition of the fetus.
**Key words:** Disseminated intravascular coagulation syndrome, pregnancy, bleeding.

**Received:** 23/07/2020 **Modified:** 20/08/2020 **Accepted:** 24/08/2020

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**This article may be cited as**: Nazarov FY, Yarmatov ST. Optimization of methods for prevention and intensive therapy of complications in pregnant women with chronic syndrome of Disseminated Intravascular Coagulation. J Adv Med Dent Scie Res 2020;8(9):82-85.

### INTRODUCTION

One of the main tasks of health authorities and institutions is the prevention and reduction of maternal and infant mortality, since these indicators have medical and social significance and determine the level of development of society and health care [1,2]. Thrombohemorrhagic complications are a constant companion of any obstetric and gynecological pathology, such as severe forms of gestosis, septic conditions, cardiovascular diseases, anemia, etc., and largely determine the course and outcome of pregnancy and child birth [3].

Revealing the causes of thrombohemorrhagic complications, understanding the pathogenesis, choosing rational diagnostics in an urgent and clinical situation, optimal tactics of intensive care, clarifying the timing of surgical or conservative treatment, anesthetic management - even this incomplete list gives an idea of the complexity and importance of this problem in an obstetric and gynecological clinic [4].

At the same time, the significance of thrombohemorrhagic manifestations of critical conditions in the obstetric clinic is still extremely insufficiently studied. In particular, clinical manifestations characteristic of disseminated intravascular coagulation syndrome (hemocoagulative

shock, acute respiratory distress syndrome, multiple organ failure syndrome) are usually associated by clinicians with the course of the underlying disease, or are considered separately, as independent, not united by a common pathogenesis, which complicates timely diagnosis and therapy of this pathology.

It should be especially noted that in the daily practice of intensive care, thrombohemorrhagic manifestations of critical conditions in obstetrics are the result of not only disseminated intravascular coagulation of the syndrome, but also other pathologies of hemostasis (congenital and acquired thrombophilia, von Willebrand disease, K-vitamin-dependent coagulopathy, coagulation dysfibrinogulopathy and etc.). Therefore, a situational approach to diagnosis and an empirical approach to treatment cannot be considered acceptable at this time [5, 6].

There is also no doubt that until now there are still quite controversial and controversial opinions on the classification structure of disseminated intravascular coagulation of the syndrome in urgent and clinical situations, as well as its differentiation with other coagulopathies in critical situations in an obstetric-gynecological clinic.

We also have to admit that the methods of correction and replacement therapy for disseminated intravascular coagulation of the syndrome have not been unified. Indications, optimal monitoring options, routes of administration and dosage of various types of heparin require further practical study [7].

In our opinion, further confirmation of the validity and dosage of cryoprecipitate and IV generation thrombolytics in the correction of hemostasis disorders in the obstetric clinic is required.

Disseminated intravascular coagulation syndrome, being one of the main causes of multiple organ failure, largely determines the outcome of the disease, and the treatment of this syndrome is a difficult task and is far from always successful. Development of issues of prevention, intensive care, disseminated intravascular coagulation of the syndrome are in the focus of attention of obstetricians-gynecologists and cardiologists therapist. Timely started complex intensive therapy and preventive measures based on the individual choice of hemodynamic support, means affecting the hemostasis system allow to ensure the removal of patients from a critical state [8, 9, 10].

Considering the above, it is advisable to develop an optimal scheme for intensive care and prevention of disseminated intravascular coagulation syndrome, which is very important for reducing maternal and perinatal mortality [11, 12].

Thus, the development of methods of prevention and intensive care of disseminated intravascular coagulation of the syndrome in obstetrics and gynecology is an urgent problem that requires new solutions.

**Objective of the study:** The aim of our study is to develop preventive methods of intensive therapy that ensure safe delivery in women with chronic disseminated intravascular coagulation syndrome and thus have a beneficial effect on the condition of the mother and the fetus.

## MATERIALS AND METHODS

In the SamMI clinic, we examined 45 pregnant women in the maternity ward with a diagnosis of varying degrees of preeclampsia with concomitant chronic disseminated intravascular coagulation syndrome. All patients were divided into two groups: the first (main) group - 23 patients, the second (control) group - 22 patients. All pregnant women underwent intensive therapy including β-blockers (atenalol, bisoprolol, metaprolol), Ca antagonists (nifedipine, amlodipine, corinfar), magnesium therapy, neurometabolic protection, if necessary, as well as infusion therapy (refortan, stabizol, etc.). Pregnant women of the first (main) group received enoxaparin and heparin in a complex of intensive care.

All patients were examined according to the standards: complete blood count, clinical and biochemical blood tests, including blood clotting according to Sukharev, prothrombin index and prothrombin time, coagulogram, hematocrit, total blood protein, blood urea and creatinine, liver enzymes (Alanine aminotrasferase, Aspartate aminotransferase ) and etc.; general urine analysis (especially protein); Electrocardiography and Echoelectrography, Ultrasonic examination of the fetus and internal organs of the mother; hemodynamic parameters (blood pressure, heart rate, pulse); examination by specialists: neuropathologist, hematologist, ophthalmologist;

All patients showed a decrease in platelet count by 44%, decrease in prothrombin index by 47%, lengthening of prothrombin time, clotting time, increase in hemoglobin parameters by 27%.

The fibrinogen level at the end of the third trimester increases by 20-30% (in comparison with the average normative values), and the increase in the number of factors that make up the external pathway of blood coagulation activation is insignificant, as evidenced by the data of the prothrombin complex (prothrombin index on average 100-110% ).

Despite the increased activity of the main procoagulants during physiological pregnancy, pathological activation of hemostasis is not detected - this is achieved as a result of balanced and compensated work of all links of the hemostasis system, which is a unique feature during pregnancy.

Thus, physiological changes in the hemostasis system refer to the manifestations of the general circulatory adaptation of the body of a pregnant woman to the gestational process, which contributes to effective hemostasis, however, these physiological changes create the background for the breakdown of adaptation mechanisms in any critical situation during pregnancy and childbirth.

## RESULTS AND DISCUSSION

In all pregnant women, the coagulogram was studied in stages: before delivery, day 1, day 3 and day 5. According to the literature and our research, in the third trimester during physiological pregnancy, there is an increase in the total activity of blood coagulation factors that make up the internal pathway of hemostasis activation - VIII, IX, X, XI, XII (Table 1).

**Table 1. Dynamics of hemostasis indices during physiological pregnancy, M ± m**

| Hemostasis tests | Research stages | | | |
|---|---|---|---|---|
| | Before giving birth | 1st day | 3rd day | 5th day |
| Hemoglobin | 0,31±0,01 | 0,31±0,01 | 0,31±0,01 | 0,32±0,01 |
| Prothrombin index% | 102,0±0,9 | 102,1±0,6 | 101,7±0,6 | 103,0±0,8 |
| Prothrombin time, sec | 14,1±0,2 | 14,3±0,2 | 14,1±0,2 | 14,6±0,2 |
| Fibrinogen, g / l | 3,6±0,1 | 3,8±0,2 | 3,9±0,2 | 3,7±0,1 |
| Platelets, thous. | 233±8,4 | 247±13,1 | 295±12,2 | 283±11,2 |
| D-dimers, ng / l | Negative | Negative | Negative | Negative |

This confirms the fact of increased activity of the coagulation link of hemostasis and thrombinemia. In the vascular-platelet link of hemostasis, there is an increase in the aggregation ability of platelets by 20 - 30%, with their normal number.

All patients underwent elective delivery. In patients of the main group during childbirth, there were no significant changes in the blood coagulogram, bleeding and the development of complications requiring transfusion of fresh frozen plasma, blood, hydroxyethyl starch solutions. In 6 patients (26%), the clotting time was lengthened by 34% during the genus, in the rest of the patients it did not change. No complications were observed during childbirth and early postpartum. In the control group, against the background of hypotonic bleeding, there were significant changes in the coagulogram and the development of complications required the use of fresh frozen plasma, hydroxyethyl starch solutions, protease inhibitors, and blood transfusion. In 2 patients (12%), due to the development of disseminated intravascular coagulation of the syndrome, the scope of the intervention was expanded by carrying out extirpation of the uterus.

**Table 2. Distribution of patients along the route of delivery, type of complications**

| | Number of patients | Development of hemorrhagic complications |
|---|---|---|
| **Main group** | 23 | 6 (26%) |
| **Control group** | 22 | 13 (58,8%) |

## CONCLUSION

The use of Enoxaparin and heparin in a complex of intensive care reduces the risk of developing fatal complications, disseminated intravascular coagulation of the syndrome in risk groups of pregnant women, and also improves indicators of the quality of life of the mother and the condition of the fetus.

## ACKNOWLEDGEMENTS

We are grateful to the staff members of Samarkand State Medical Institute for the cooperation and support in our research. The participants kindly gave full written permission for this report.

## CONSENT

Written informed consent was obtained from all participants of the research for publication of this paper and any accompanying information related to this study.

## CONFLICT OF INTEREST

The authors declare that they have no competing interests.

## FUNDING

No funding sources to declare.

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