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Plasma radiation treatment influence in the process of infected postoperative wounds

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Abstract

In the work have described methods of the treatment of purulent wounds by plasma rays during post-caesarean section sepsis in gynecological patients group. It was established that along with the basic treatment, the use of plasma rays as an auxiliary method relatively reduces the wound healing time in that group. Also, it was appealed on the simplicity and budget of the method as effective.

KEY WORDS: plasma flows; caesarean section; infected wound; sepsis

Introduction

Nowadays one of the most acute problems in modern medicine postoperative complications remain, to be more specific, one of them is wound infection after caesarean section. It is notified that caesarean delivery is one of the most frequent surgical interventions performed worldwide accounting for up to 60% of deliveries in a number of countries [1,2]. It carries the risk for various short-term postoperative morbidities, including surgical site infection (SSI), which is one of the most common complications

following caesarean section, and has an incidence of 3%-15%. It depends on prevalence of the accompanying diseases, general condition of the patient, blood loss during operation, complication after operation-septic condition [2,3,4].

It places physical and emotional burdens on the mother herself and a significant financial burden on the health care system. Moreover, SSI is associated with a maternal mortality rate of up to 3%. With the global increase in caesarean section rate, it is expected that the occurrence of SSI will increase. Given its substantial implications, recognizing the consequences and developing strategies to diagnose, prevent, and treat SSI are essential for reducing postcaesarean morbidity and mortality. It may prolong maternal hospitalization, increase health care costs, and lead to other socioeconomic implications. Optimization of maternal comorbidities, appropriate antibiotic prophylaxis and evidence-based surgical techniques are some of the practices proven to be effective in reducing the incidence of SSI. The problem is exceedingly actual because of increasing resistance of microflora and consequently, reduced efficiency of antibiotic therapy. Sometimes the treatment of infected wounds lasts months [2,5,6] and affects psychological condition of the patient, therefore it is related to great financial expenses. It is very important to find new supplementary methods for the treatment of infected wounds with basic treatment with antibiotics and pathogenic and etiologic treatment.

At present, in medicine broad varied physical methods were identified, as thermal and laser radiations. The experience of their using has shown perspective of this method in different pathologies. One of the most perspective ways of admission of heat energy to centre of the pathological changes, as well, as biologically active zone and point is use the temperature plasma flow. The plasma – the most widespread, the most power-consuming and very slopy from four conditions of material. The plasma consists of ionof any element of the periodic system. The material moves over to condition of the plasma under expence of the greater energy from outside. In the process of destruction is accompanied by a big splash of energy (light, gravitating to ultraviolet spectrum and heat up to 15000°C [2,7,8].

The plasma impact is compact, reliable and technically simple, easy for functioning and service. Its flexible design allows working practically in any area. The flows of plasma do not cause negative effect on the patient and medical personel. Using plasma presents itself essential breakout in the field of physical methods of the influence on biological fabrics and many authors commite perspective of use of plasma in modern medicine [1,7,9,10,11,12]. One of the advanteges of this method is the possibility of reducting the overall expenses of treatment and the length of treatment.

Goal and objectives

The reason of the study was to show the results of using plasma flow as a supplementary method in patients with an infected wound after caesarean section sepsis. The purpose of the study was to define the perspective of using the plasma in treatment of infected wounds in patients with gynecological sepsis – after caesarian section.

Materials and methods

We studied the influence of plasma radiation in treatment of infected wounds.

The study was conducted in Acad. V. Bochorishvili Clinic – gynecological department. The method was applied to 10 patients (group 1) and compared to 10 patients without plasma radiation (group-2).

We used argon plasma radiation. 10 procedures were made 2 times a day during 5-7 minutes. The temperature plasma ray on wound surface cover was in the range of 40-42°C.

The method was safe, did not require preliminary preparation and did not depend on severity of the pathology. All patients received standard treatment.

Results and discussion

1. A quick healing of the wound because of bactericide and drying effect of the plasma;
2. More swift regenerative processes in the wound;
3. Improvement by reducing the intensity of post operational pain during the postoperative period;
4. Reduction of average length of treatment by 5-7 days;
5. Reduction of hospital stay days;
6. Reduction of average cost of treatment.

Conclusion

Positive effects of the use of plasma radiation for treatment of infected wounds in patients with post caesarean sepsis were reported during the study period. Data received by this study gives us the opportunity to recommend the method of plasma irradiation as a supplementary method in the treatment of infected wounds in patients with postcaesarean sepsis.

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