

**COMPARATIVE EVALUATION OF COMPLEX TREATMENT OF PERI-
IMPLANTITIS AFTER DENTAL IMPLANTATION ACCORDING TO
MICROBIOLOGICAL INDICATIONS**

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Abstract. 66 patients who underwent dental implantation were observed. The main group received ozone therapy locally. A bacteriological study was carried out. It was found that as a result of the proposed method of combined treatment, the contamination of inflamed periodontal areas significantly decreased, both quantitatively and qualitatively.

Key words: dental implantation, peri-implantitis, oral microflora.

**СРАВНИТЕЛЬНАЯ ОЦЕНКА КОМПЛЕКСНОГО ЛЕЧЕНИЯ
ПЕРИИМПЛАНТИТОВ ПОСЛЕ ДЕНТАЛЬНОЙ ИМПЛАНТАЦИИ ПО
МИКРОБИОЛОГИЧЕСКИМ ПОКАЗАНИЯМ**

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Аннотация. Под наблюдением находилось 66 пациентов которым была проведена дентальная имплантация. Основной группе применяли озонотерапию местно. Проводили бактериологическое исследование. Было установлено, что в результате предложенной методики комбинированного лечения существенно снизилась обсемененность воспаленных участков пародонта как в количественном, так и в качественном отношении.

Ключевые слова: дентальная имплантация, периимплантиты, микрофлора полости рта.

INTRODUCTION

According to a number of authors, 65% of the country's population aged 35-40 years needs dental prosthetics, and modern technologies, especially with the use of removable dentures, do not satisfy people of working age who perceive such orthopedic care as an obstacle to active professional and social activities (Mirgazizov M.3., 2000; Olesova V.N., 2000; Paraskevich V.L., 2002). Despite the successes of dental implantology, there is still a fairly large percentage of postoperative complications (from 10% to 18%) associated with trauma, wound damage and

aseptic inflammation (peri-implantitis), leading to implant rejection, and therefore their prevention is an important medical issue -social task.

MAIN PART

A priority and promising area of restorative medicine is the development of new technologies that increase the functional reserves of a healthy and sick person, which is important for the rehabilitation of patients during surgical interventions (Panin A.M., Ivanov S.Yu., 2002; Ushakov R.V., Tsarev V.N. , 2003; Yurchenko M.Yu., 2003). For this purpose, in recent years, non-pharmacological methods have been widely used, aimed at enhancing regeneration and reparative processes that contribute to the strengthening of implants, especially in the early postoperative period (Korchazhkina I.B., 2002; Orekhova L.Yu., 1997).

Ozone therapy has an anti-inflammatory and anti-edematous effect, normalizes microcirculation in tissues subjected to surgery, reduces the permeability of the vascular wall, stimulates metabolic processes and immune functions of the body, increases the oxygen content in the blood and tissues, accelerates wound healing, has a neurotropic and analgesic effect, and also causes stimulation of repair processes and metabolism in bone tissue.

In connection with the above, it seems relevant to study the possibility of accelerating regenerative processes and preventing inflammatory complications during intraosseous dental implantation using ozone therapy in combination with the immunomodulator cycloferon.

Materials and methods. All patients, in accordance with the objectives of the study, were randomized into 2 groups: main and control. The main group included 33 patients who, in the early postoperative period, were included in the traditional treatment and prophylactic complex from the 2nd day after surgery with local ozone therapy.

The control group consisted of 33 patients who, from the 2nd day after dental implantation surgery, were treated with a traditional treatment and prophylactic complex, which included hygienic treatment of the postoperative area with antiseptic solutions (chlorhexidine, hydrogen peroxide, furatsilin), analgesics and antibiotics according to indications.

The course of the early postoperative period was assessed in all patients starting from the second day after surgery, then on days 6-7, 9-10 and 12 after surgery. In the initial state, all patients of both groups who underwent intraosseous dental implantation showed clinical signs of local inflammation, as well as a general body reaction to the inflammatory process, already on the 2nd day after the operation. Clinical signs of local inflammation in the area of surgical intervention, such as pain, swelling and hyperemia of the mucous membrane, fibrinous plaque on the suture line, were found in all patients, while manifestations of the inflammatory reaction at the level of the whole organism were not determined in all patients, which, apparently was associated with the individual characteristics of the immunity and reactivity of the body of individual patients, as well as the presence of appropriate microflora. It should be noted that ozone therapy was well tolerated by all patients; in not a single case, not a single patient had a deterioration in the clinical condition either during the procedure or in subsequent periods of application of the procedure. **Table 1 presents summary data of the results of the main clinical signs of local inflammation after dental implantation surgery in patients of the main and comparison groups after the 7th ozone therapy procedure.**

Table-1. The main clinical signs of local inflammation after dental implantation in patients of the main and comparison groups after ozone therapy (in absolute numbers and in %).

Clinical sign	Main group	Comparison group
Soreness	14 (30,4%)	30 (62,2%)
Swelling of the mucous membrane	10 (21,7%)	19 (51,5%)
Hyperemia of the mucosa	9 (19,5%)	17 (45,9%)
Fibrinous plaque	12 (26%)	16 (43%)
Local temperature	6 (13%)	12 (32,4%)
Low-grade fever	2 (4,3%)	3 (8,1%)
Enlarged lymph glands	3 (6,5%)	7(18,9%)

After just 2-3 days of ozone therapy, most patients experienced decreased pain in the surgical area, and postoperative discomfort in the oral cavity was also significantly reduced. And after 5-6 days, patients in the main group compared to the control group showed a more pronounced relief of the main manifestations of both local inflammation and its signs at the level of the whole organism.

The manifestation of pain in the main group during this period was noted only in 30% of patients versus 62% in the comparison group, swelling and hyperemia of the mucous membrane were detected in 23% and 21%, respectively versus 51 and 46% in the comparison group, fibrinous plaque on the suture lines in 25% of cases (in the comparison group - 42%), local temperature - in 12% of cases (in the comparison group - 32%), subfebrile body temperature - in 3% of cases (in the comparison group - 8%), enlarged lymph nodes - in 3% (in the comparison group - in 15%).

It was found that as a result of our proposed method of combined treatment of various forms of peri-implantitis, the contamination of inflamed periodontal areas in patients significantly decreased, both quantitatively and qualitatively. Thus, if in patients of the compared group it was revealed that all the same types of pathogenic microflora were preserved in the foci of inflammation, including fungi of the genus *Candida*, actinomycetes and fusobacteria, although in quantitative terms there was a slight decrease in the level of contamination, then in patients of the main group fungi practically disappeared, *Escherichia coli*, fusobacteria and actinomycetes.

The level of contamination with bacteria of the strepto-staphylococcal group decreased by 2-3 orders of magnitude. As a result of the combined treatment, there was a complete disappearance of fungi and a sharp decrease in the number of other representatives of microflora from biological material taken from the inflamed areas of the periodontium of patients with various forms of peri-implantitis.

In the case of traditional treatment, the qualitative and quantitative composition of the microflora isolated from the gingival fluid of patients in the compared group underwent less pronounced changes (Table 2).

Table 2. Qualitative and quantitative composition of microflora during periimplantitis in patients of the main and comparison groups before and after treatment (in 1 ml of gingival fluid)

Microflora	Before treatment	Main group	Comparison group
Streptococci	1×10^3	1×10^1	1×10^3
Staphylococcus	1×10^4	1×10^2	1×10^1

Escherichia coli	1×10^3	-	1×10^2
Spirilla	1×10^2	1×10^1	1×10^2
Actinomycetes	1×10^3	-	1×10^2
Mushrooms	1×10^{15}	-	1×10^2

It should also be noted that the contamination of the oral cavity with microorganisms - representatives of pathogenic and opportunistic flora as a result of combined treatment of peri-implantitis was sharply reduced, which was especially significant in relation to aerobic flora. The results of combined treatment of patients with various forms of peri-implantitis revealed a good therapeutic effect, expressed in a significant reduction in the rehabilitation period in patients of the main group compared to the comparison group treated with traditional methods.

At the same time, the severity of inflammatory phenomena decreased within 2-3 days from the start of treatment, pain and discomfort from the gums decreased. Objectively, the patients had a decrease in swelling and hyperemia of the gingival margin, as well as purulent-serous discharge from the implanted periodontal areas.

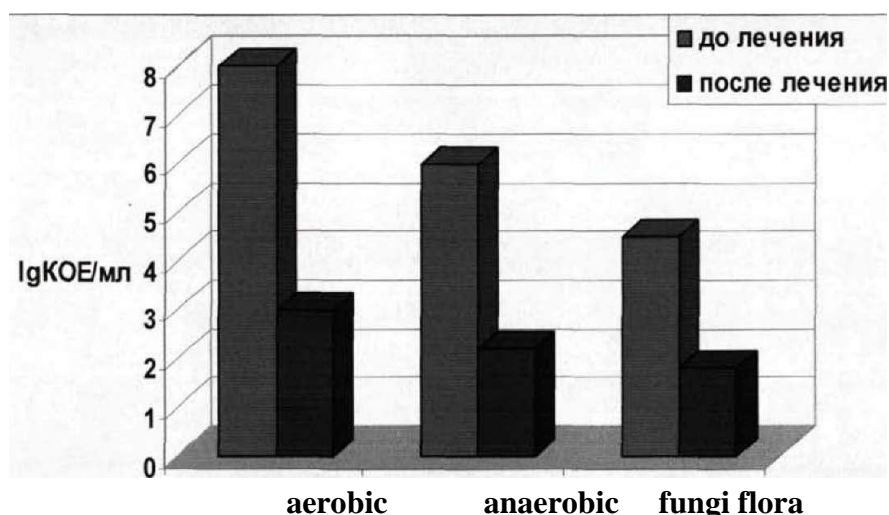


Figure.1 Microflora in 1 ml. oral fluid for peri-implantitis before and after treatment (the number of colony-forming units of bacteria in 1 ml., expressed in logarithms).

A pronounced anti-inflammatory effect after 2-3 days of treatment was noted in patients with class I peri-implantitis, and in patients with class 2 peri-implantitis, relief of the pathological process began from 4-5 days from the start of treatment. It should be emphasized that all patients noted an improvement in their well-being, however, the effectiveness and duration of treatment definitely depended on the severity of the inflammatory process in the periodontium. When observed over time, patients showed a significant decrease in the inflammatory reaction of the periodontium and purulent discharge. At the same time, patients noted a decrease in pain, discomfort and the disappearance of bad breath. In patients of the control group, all noted signs and indicators were significantly inferior to those of the main group, both in terms of timing and in terms of qualitative and quantitative characteristics.

Thus, the method of local ozone therapy, included in the rehabilitation complex in the early postoperative period after dental implantation, ensures the normalization of a number of immunological parameters of the body, increases local nonspecific resistance, which ultimately

contributes to more effective relief of the inflammatory process and a long-term favorable prognosis in terms of long-term results. At the same time, the processes of reparative osteoregeneration in patients with peri-implantitis of both classes 1 and 2 are improved, which can help strengthen the implant in the process of eliminating the inflammatory process.

A cumulative assessment of the regression of clinical signs of inflammation and special research methods made it possible to establish the high therapeutic effectiveness of ozone therapy in patients with peri-implantitis of both classes 1 and 2 (97% and 89%, respectively), in contrast to the control group, where the effectiveness was significantly lower (79 % and 71%, respectively). The rather high therapeutic effectiveness was confirmed by the results of long-term observations, which indicated that the clinical effect obtained immediately after a course of ozone therapy persisted for a year in 100% of cases. This was evidenced by the absence of relapses of inflammation and implant rejection.

CONCLUSION

Thus, the results obtained indicate that the developed method of ozone therapy is a pathogenetically substantiated and highly effective treatment method for the prevention of peri-implantitis of classes 1 and 2, which distinguishes it favorably from the methods of basic therapy carried out for peri-implantitis and indicates the advisability of its use in dental implantology.

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