RESULTS OF LASER ACUPUNCTURE INFLUENCE ON LOCAL CLINICAL AND LABORATORY INDICES AFTER DENTAL IMPLANTATION IN EXPERIMENT

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Introduction

Last decades, method of dental implantation is widely used as well as other methods of special dental care applied by cranio-maxillofacial surgeons and orthopedist in Belarus [8,10]. Osteointegration is a process undergoing changes and not something stable [2]. Many factors influence on implant osteointegration: state of bone, implant characteristics, operation itself, quality of prosthesis in the future. In special medical literature they say that all processes taking place in head, neck regions, oral cavity influence on qualitative and qualitative indices of oral fluid [3,11,12]. Latrogenic injury of bone tissue has place during operation for dental implantation as well as aseptic inflammation which activate regeneration processes or can provoke tissue lyses [4,9]. Meanwhile, the longer and well-defined postoperative inflammatory process, the better direct and long-terms results for dental implantation operation [13]. At the same time inflammatory and destructive processes of the oral cavity influence on the change of pH level of biological medium of the oral fluid [5]. Achievements of modern medicine let to form more favorable conditions for broken bone tissue regeneration with medicines, treatment by laser and acupuncture [7,11]. But there is no information in special medical literature about results of laser acupuncture influence on pH of oral cavity after operation of dental implantation in experiment.

Aim of the work

is to study laser acupuncture influence on pH of natural biological medium of oral cavity after dental implantation.

Object and methods

Rabbits were chosen for experimental model. We observed 40 males at the age 7–8 months, weight 2.8–3.2 kg. Experiment consisted of two runs, 20 animals per run. Dental implantation was performed after right central lower incisor extraction for all animals. Transplant bed was formed with drill point of increasing diameter in the alveolar socket of the extracted tooth. Drill point was cooled with salt solution. Than tap was screwed and titan implant Verline was fixed. The wound was treated with 0.05% solution of chlorhexidine bigluconate and closed with polyglycolipid 4-0 layer by layer. Sutures were treated with 1% solution of brilliant green. Operations were performed with general anesthesia application of 10% solution of thiopental sodium intra-abdominaly and infiltration anesthesia applica-

References

tion in soft tissues of the operative field with Sol. Lidocaini 2% - 2 ml.). Animals underwent antibacterial therapy course with 30% lincomycine solution during 5 days postoperatively. Immediately after operation, they done injection of Analginum 50% - 2 ml. + Dimedrolum 1% - 1 ml. First run consisted of 21 animals. Antibacterial therapy treatment combined with laser acupuncture course by acupuncture needle (patent of Republic of Belarus № 924) which irritate acupoint and do mechanic influence at it at the same time was applied for animals. Acupoint LI4 was irritated. Acupuncture treatment course consisted of 10 sessions performed ever day. Consistence of luminous flux was no more than 5 mW/cm2, time of exposure 10 seconds. Second run consisted of 21 rabbits received antibacterial therapy course only. It was run of control. pH level of habitat of oral cavity of experimental animals was examined with test-paper (Lachema, Prague). Test-paper was put into rabbit oral cavity for 30 seconds, than it was compared with standard (pH from 0 to 12). Examinations were performed before operation, 7,14,21 days and 2 months after operation.

Results

We have studied normal pH level of oral fluid for rabbits immediately before operation. Indices of pH were in range between 7,5 - 9, average indices were 8,2±0,2. Seven days later, rabbits of the first run had pH level 7,8±0,3, rabbits of the control run had that indices as 7,5±0,1. Rabbits of the control run had tissue inflammation in 100% of cases and 15% of tissue inflammation for rabbits of the first run. pH indices of oral fluid of the run of control were 7,3±0,1, rabbits of the first run - 7,9±0,2 (p<0,01), by 14 days. But, graft rejection had place for 10% of rabbits of the control run and there was no rejections for the first run rabbits. That indices was 7,6±0,2 for rabbits of the control run and 8,4±0,4 (p<0,05) for rabbits of the first run, 21 days postoperatively. That time, only 5% of rabbits of the first run had tissue inflammation. Graft rejection had place for 15% of the control run and there was no rejections for the first run rabbits by 21 days after operation. We received the same results two months later. Dynamics of pH of oral cavity for experimental animals see on the FIG.1.

![FIG.1. Dynamics of pH of oral cavity for experimental animals.](image)

Therapeutic effect after laser acupuncture application could be explained by common and local reactions of the human body. Increasing of nonspecific humor factors of protection, common leucocytes reaction, phagocytal activity of micro- and macrophage stimulations, stimulation of marrow blood circulation consisted common effect. Local effect is influence of radiation on the main elements of inflammatory reaction: exudation, alteration, proliferation, and on metabolism intensity, biosynthetic processes, cells resistance when damage. Laser acupuncture is positive for membrane structures, increase tissue ferments activity: acid and alkaline phosphatase, lactate dehydrogenase, L-glycerophosphatedehydrogenase; accelerate oxidation-reduction reactions, extend functional activity of protein, stimulate glycojen synthesis. Its activate process of injured tissues vascularization, provide tissues with nutrients and oxygen, prevent stagnation formation. Lymphoid tissue is activating, granulation is growing. Perifocal inflammaion is becomes weaker, oxygen consumption increases. Those mechanisms correspond to the Ahmetov’s (1991) and Naumovitch’s (2000) works [1,6].

Conclusion

Results we received confirm necessity and expedience for further study of laser acupuncture influence on homeostasis of oral cavity and osteofusion in the system jaw – dental implant in experiment and clinic.

References

[13] Ushakov R.V., Tzarev V.N. Prophylaxis of postoperative inflammatory complications during intraosseal dental implantation with medicines Elugel, Eludril, Elgidium containing chlorhexidine and on metabolism intensity, biosynthetic processes, cells resistance when damage. Laser acupuncture is positive for membrane structures, increase tissue ferments activity: acid and alkaline phosphatase, lactate dehydrogenase, L-glycerophosphatedehydrogenase; accelerate oxidation-reduction reactions, extend functional activity of protein, stimulate glycojen synthesis. Its activate process of injured tissues vascularization, provide tissues with nutrients and oxygen, prevent stagnation formation. Lymphoid tissue is activating, granulation is growing. Perifocal inflammaion is becomes weaker, oxygen consumption increases. Those mechanisms correspond to the Ahmetov’s (1991) and Naumovitch’s (2000) works [1,6].

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