

DYNAMICS OF BIOCHEMICAL INDICATORS IN BLOOD AFTER USING BARRIER MEMBRANES IN THE EXPERIMENT

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Guided bone regeneration (GBR) is a reasonable and effective method used in maxillofacial surgery. Almost any bone defect in the jaw, whether it is a socket of extracted tooth or a bone defect after cystectomy, can be repaired using GBR. The key role in this technique is played by barrier membranes, which limit the proliferation zone of the new bone from the ingrowth of soft tissue elements. Unfortunately, it is customary to judge the success of GBR, as well as the quality of obtained bone, after the fact, according to the results of X-ray research methods, and the data of clinical examination and intraoperative evaluation of the obtained tissue (for example, if a subsequent dental implantation was planned). Often, to characterize the reparative processes of bone tissue, only a clinical assessment is insufficient with a statement of the absence of inflammation. X-ray research methods are also not very informative in the early postoperative period. One of the promising methods for non-invasive study of reparative processes of bone tissue in the early period is biochemical blood test.

Materials and Methods. The objects of study were 15 chinchilla rabbits. Animals were divided into three series. In the I series (6 animals), an operation was performed on the lower jaw using barrier membranes as follows. A linear skin incision was made under the general anesthesia in the area of lower jaw body, the vestibular cortical plate was skeletonized, then bone defects with a diameter of 5 mm were formed with cutters to a depth of 6 mm, then a collagen barrier membrane with a diameter of 15 mm was placed on the bone wound, the wound was sutured in layers. Animals of the II series (6) in the area of the body of the lower jaw also formed a bone defect, but without the use of barrier membranes.

III series of animals (3) was a reference. In postoperative period, the prevention of purulent-inflammatory complications was carried out by broad-spectrum antimicrobials for 7 days intramuscular. Before surgery, on the 7th, 14th, 21st and 28th day, venous blood was taken from the ear marginal vein for subsequent biochemical studies. In the obtained blood samples, the activity level of alkaline phosphatase (U/l) and the content of Ca ions (mmol/l) were determined.

Results. Biochemical studies of venous blood reflect the nature of the reparative processes that occur in bone tissue after surgical treatment. In animals of series III, the activity of alkaline phosphatase did not significantly differ in dynamics and averaged 54.1 (U/l). The value of Ca ions was 3.1 mmol/l. In series I and II before the operation, alkaline phosphatase activity averaged 54.2 and 53.0 (U/l), Ca ion values were 3.0, 3.1 mmol/l, respectively. In the postoperative period, a difference was observed in the dynamics of the studied parameters in series I and II. So, in series I, on the 7th day, the activity of alkaline phosphatase increased on average to the level of 83.6 (U/l), on the 14th day it increased to 98.3 (U/l), and on the 21st day it had a maximum value of 134.1 (U/l). On the 28th day, the indicator was 67.5 (U/l). In series II, on the 7th day, the activity of alkaline phosphatase was 62.1 (U/l), on the 14th day, 76.7 (U/l), on the 21st day, the enzyme activity was 92.3 (U/l) and decreased by the 28th day to the level of 63.8 (U/l). The number of detected Ca ions changed in dynamics, however, in series I and II there were no significant differences and amounted to 3.4 and 3.3 (mmol/l) on the 7th day, on the 14th – 3.6 and 3.6 (mmol/l), on the 21st – 4.2 and 4.1 (mmol/l), on the 28th – 3.8 and 3.9 (mmol/l), respectively. An increased activity level of alkaline phosphatase in animals of the 1st series after surgery (with using barrier membranes) indicates an active

reparative process. This is due to reliable stabilization of the blood clot in the wound by the barrier membrane and the chemoattractant effect of collagen for participants in inflammatory process.

Prospects for further research. The study of the reparative processes of the bone tissue of the jaws with guided bone regeneration is a promising scientific direction. Taking into account biochemical parameters, we found that the barrier membrane, being a foreign body, does not contribute to the enhancement of the postoperative inflammatory reaction, but plays a preventive role and prevents the development of postoperative complications.

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Key words: barrier membranes, guided tissue regeneration, alkaline phosphatase.

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MOLECULAR BIOMARKER OF Y CHROMOSOME AND CFTR GENE IN INFERTILE MALES

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Male infertility due to azoospermia has been associated with genetic risk factors in 15%–30%. The most common molecular causes are Y chromosome (AZF region) and mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. The Purpose: To determine Y-chromosome microdeletions of the AZF and CFTR gene mutations in azoospermic infertile men, before assisted reproductive techniques (ART).

Materials and Methods: Our study was carried out on 25 infertile men recruited among infertile couples referred for ART treatment. All patients signed an informed consent. Criteria for including a patient were fulfilled if they presented with azoospermia, raised or normal levels of FSH, LH and testosterone. They were investigated by molecular testing for AZF and CFTR gene. Multiplex Polymerase chain reaction (PCR) was performed using Y-specific markers for AZF region: sY84, sY86 (AZFa); sY124, sY134 (AZFb); sY254, sY255 (AZFc), and internal controls: sY14/SRY and ZFX/ZFY. Two common mutations of the CFTR gene were tested $\Delta F508$ and G542X.

Results: We identified in two patients deletions of Y chromosome in the AZFc regions deleted markers were sY254 and sY255 both for the DAZ (Deleted in Azoospermia) gene. They showed slightly elevated FSH and low testosterone. In one patient microdeletions were detected in each region of AZFa-sY84, sY86; AZFb-sY124, sY134; AZFc-sY254, sY255 and presence of SRY and ZFY, hormonal markers was in normal. One man also carried a CFTR gene mutation $\Delta F508$, for calculating the risk of recurrence in offspring was investigated and his wife, found himself homozygous.

Conclusions: All male with severe semen analysis should be offered genetic testing and counseling prior assisted reproduction is applied.

Key words: infertility; male; AZF region; azoospermia; $\Delta F508$