

Міністерство освіти та науки, молоді та спорту України  
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# АКТУАЛЬНІ ПИТАННЯ ТЕОРЕТИЧНОЇ ТА ПРАКТИЧНОЇ МЕДИЦИНИ

Topical Issues of Clinical and Theoretical  
Medicine

**Збірник тез доповідей**  
III Міжнародної науково-практичної конференції  
Студентів та молодих вчених  
(Суми, 23-24 квітня 2015 року)

Суми  
Сумський державний університет  
2015

The aim of our study was to understand the concept of changes of the heart wall under the influence of overhydration using scanning electron microscopy

**Materials and methods.** The experiment involved 12 eight month of age white laboratory male rats. Alimentation and experiments were conducted in accordance with the "European Convention for the protection of vertebrate animals used for experimental and other scientific purposes"(Strasbourg, 1986). Animals were divided into 2 series: experimental and control, 6 animals in each. To achieve the overhydration experimental rats received 10 ml distilled water three times a day through a tube, ate boiled demineralized food and were injected synthetic analogue of ADH (vasopressin )"Mynyrin "(Ferring) twice daily at a dose of 0.01 mg. The simulation of severe overhydration was 25 days. The control animals were injected the "Mynyrin"(Ferring) twice daily at a dose of 0.01 mg, considering the potential effects of vasopressin on the cardiovascular system. Animals received normal drinking water and food within the daily physiological needs. The animals were taken out of the experiment by the introduction ketamine at a dose of 70 mg/kg. Preparations for scanning electron microscopy were prepared according to standard methods.

**Results and discussion.** Upon reaching the animals severe overhydration the heart wall becomes widened and swollen. We observe thickening of left ventricular wall in 1.2 times and thickening of the right ventricular wall by almost half compared with the control. The walls of the heart are thickened under overhydration, especially in the ventricles because the ventricles perform most function of pumping blood. The myofibrils increase in thickness, in regards to this, at the onset of this condition( overhydration /water intoxication), the fluid outside the cells of the heart muscle has an excessively low amount of solutes. In comparison to that inside of the cells is more concentrated causing the fluid to shift through (via Osmosis) into the cells to balance the concentration. This causes the cells (myocytes) to swell due to inflow of the fluid to the intracellular matrix. Swelling of the cells causes the stiffness or thickening of myofibrils that make up the myocytes. We mark local missing of myofibrils transverse striation (cytolysis phenomenon), dilatation of intracellular spaces with collagen strands inside, aggregation of erythrocytes in vessels.

**Conclusions.** Using the method of scanning electron microscopy allows to reconstruct the volumetric structure of the heart wall. At water intoxication we observe changes both in the myocardial parenchyma and stroma. Changes in parenchymal component manifested by swelling of the myofibrils with local cytolysis. Changes in stromal component expressed in edema of intercellular spaces, increasing of collagen production and stasis of erythrocytes in the blood vessels.

## **PERIOSTAL REACTION AFTER IMPLANTATION OF B (ZR-TI) AND TI – ALLOYS**

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Osteointegration is a main factor of successful implant ingrowth. It depends on quality of bone, lack of initial stability, excessive loading, loosening or fracture of screw and fracture of implants. Other factors that can affect osteointegration are implant composition and features of implant surface. There are a lot of metals and ceramics have used in dental surgery last 40 years. Dental implants have applied as an alternative treatment method for the prosthodontic restoration of partial or full edentulous patient. There are a lot of reports about implant failure that from 6% to 11% according to different search. The main reason of implant failure is disorders of osteointegration that depends on composition of implant material, surface structure and implant elasticity and strength. Titanium is a good material for dental implants due to its mechanical parameters, non-toxicity and bio-inert. But it has some disadvantages such as high Young Modulus, low elasticity and low bone integrity. To improve quality of dental implants we can modify titanium alloys by adding of other metal such as aluminum or zirconium. There are a few reports about the periosteal reaction after pure Ti and Zr-Ti alloys implantation.

The aim of current research was to evaluate histology reaction of hosting bone in different period after the implantation of Ti and Zr-Ti alloys.

In experiment we used 30 rabbits for implantation of  $\beta$ (Zr-Ti)-alloys (experimental) and TiVT6 dental implants (control) in distal epiphysis of the femur. In 1, 3 and 6 months after implantation we control bone/implant interface by histological method.

1 month after the implantation around the Ti and Zr-Ti alloys we can suggest bone remodeling that leads bone loss and formation of connective tissue cuff that separate implant from bone tissue. 3 and 6 month after the implantation of pure Ti alloy we can see presence of connective tissue cuff and loss of bone tissue surrounds the implant. Compare the Ti alloy, Zr-Ti graft implantation leads connective tissue transformation in 3 months after the implantation time. 6 month after the implantation of Zr-Ti alloy we can suggest formation of trabecular bone around the graft.