

УЧАСТЬ МЕДІАЛЬНОГО ТА ЛАТЕРАЛЬНОГО ПРЯМИХ М'ЯЗІВ ОЧНОГО ЯБЛУКА В РУХАХ НАВКОЛО САГІТАЛЬНОЇ ВІСІ

Булига В.С.

Науковий керівник: доц. Лебединець М.Г.

Запорізький державний медичний університет

Кафедра анатомії людини, оперативної хірургії та топографічної анатомії

Згідно даних літератури (Р.Д. Синельников та інші, 2014; Gray's Anatomy, 2005) очне яблуко підіймають верхній прямий та нижній косий м'язи, опускають - нижній прямий та верхній косий, відводять - латеральні прямий, верхній та нижній косі, приводять - медіальний, верхній та нижній прямі. Навколо сагітальної вісі повертають очне яблуко до серединної площини (інторзію) верхні косий та прямий, а латерально (ексторзію) - нижні косий та прямий м'язи. Тобто, верхній та нижній прямі м'язи, та обидва косі, мають по три функції, а латеральний та медіальний – по одній. В Gray's Anatomy (2005) є твердження, що при будь-якому русі очного яблука змінюється довжина і напруга всіх шести м'язів. Ми довели участь медіального та латерального прямих м'язів в рухах навколо фронтальної вісі (Булига В.С., Кутащук К.І., 2015).

Метою цієї роботи є вивчення участі цих м'язів в рухах навколо сагітальної вісі. Для цього ми використали геометричний та графічний методи дослідження і встановили, що при повороті очного яблука навколо сагітальної вісі довжина медіального прямого м'язу збільшується приблизно на 0,05 мм на кожен 1°, а довжина латерального прямого м'язу зменшується приблизно на 0,04 мм на 1°.

Отже, медіальний і латеральний прямі м'язи приймають участь і в рухах навколо сагітальної вісі та діють як антагоністи.

CHANGES THAT OCCUR IN INDICES OF BLOOD IRON METABOLISM IN RATS FOLLOWING THE ADMINISTRATION OF BLOOD SERUM OBTAINED FROM ANIMALS WITH MODELLED EXPERIMENTAL HAEMOLYTIC ANAEMIA

Burega I.Yu.

Scientific supervisor: prof. Filimonov V.I.

Zaporozhye State Medical University

Department of Normal Physiology

Background. Haemolytic anemias are the group of diseases characterized by pathologically intensive destruction of erythrocytes, increased formation of their decomposition products, as well as reactive enhancement of erythropoiesis. In recent decades one of the key problems of current medicine is the high prevalence of congenital and acquired hemolytic conditions that appears due to acute infectious diseases, impairment of blood transfusion protocol, formation of the autoimmune reaction in response to the administration of some antibodies, increased use of pesticides, colorants, substances and toxicants of vegetables or artificial nature, which composed of highly reactive hydrazines. Despite the existing variety of medicines, the protocols of treatment and correction of the conditions caused by haemolysis the iron metabolism does not always depend on the nutritional component. There are numerous factors that affect the metabolism, transport and provide the required amount of iron for saturation of erythrocytes and correspondingly realize the blood main function – the gas exchange. They include the hepcidin system, chalone - anti-chalone factor, influence of erythroferrone. In the experiment we studied the influence of thin humoral factors of iron metabolism in the blood serum obtained after phenyl hydrazine-induced anaemia.

The research was **aimed** to determine the changes in indicators of blood iron metabolism in rats after administration of blood serum obtained following the simulation of experimental haemolytic anaemia.

Studies were conducted on white laboratory male rats. Animals were divided into the 5 groups: the 1st group involved intact rats (I); the 2nd group included rats – donors of blood serum (D), which were subjected to a single dose of 2% phenyl hydrazine solution (150 mg/kg) intraperitoneally; the 3^d group involved rats-recipients of blood serum (R1), which were intramuscularly given 2 ml of blood serum taken from the animals of the 2nd group; the 4th group was made up of rats-recipients 2 (R2), which were given intramuscularly 2 ml of blood serum taken from the animals of the 3rd group; the 5th group involved control (C) animals, which were administrated 2 ml of physiological solution intramuscularly. The killing of the animals and taking the material from the 2nd experimental group were done on the 3rd and 21st day, and in the 3rd experimental group this was done on the 1st day; and in the 4th and 5th groups on the 1st, 3rd, 5th day after injection. The studied indicators including the reticulocytes quantity (%), the red blood cells quantity ($\times 10^{12}/L$), haemoglobin quantity (g/L) and hematocrit (%) assayed by haematology analyzer MYTHIC 18 (France); iron serum ($\mu M/L$) total iron binding capacity (TIBC) ($\mu M/L$), unsaturated iron binding capacity

(UIBC) ($\mu\text{M/L}$), a percent of transferrin saturation (%) were determined by an automatic biochemical analyzer PRESTIGE 24i (Japan) at the clinical diagnostic laboratory of Scifically-Educational Medical Center "University clinic" Zaporozhye state medical university.

Results. After administration to animals of blood serum taken from the animals of group R2, which did not contain erythropoietin (elimination half-life of erythropoietin was 1, 5 – 2 hours) at the background of unaltered quantity of reticulocytes was administered to the animals, we detected the significant growth of blood serum iron content, TIBC, UIBC and percentage of transferrin saturation since the 1st to the 3rd day after administration. From the 3rd to the 5th day we observed the tendency to decreasing in indicators of the total iron, TIBC, UIBC and percentage of transferrin saturation.

Conclusion. Analysis of the findings can assume with high probability that the serum of animals, which were administrated the serum from the group with modelled haemolytic anaemia contains humoral factor of mediated action, that affects the system of blood iron transport and does not affects the activity of erythropoiesis.

HYPOTHALAMUS AND ITS ROLE IN BLOOD PRESSURE REGULATION AND HYPERTENSION DEVELOPMENT

Varahabhatla Vamsi

Scientific supervisors: lect.-int. Kuzo N.V.

Zaporozhye State Medical University

Department of Pathological Physiology

Background. The etiology of essential hypertension is multifactorial and not completely understood. It is known central mechanisms of blood pressure maintenance play an important role in hypertension development. In this case we should consider the hypothalamus as one of the major sites of central blood pressure control.

The aim was to study hypothalamus and its role in blood pressure regulation and hypertension development.

Method and materials. Literature analysis based on the recent data from different authors.

The central nervous system (CNS) definitely plays an important role in the short term control of BP, but its contribution to the chronic control of BP is not yet clear. In fact, research in the past years has been directed to essential hypertension with possible neurogenic cause.

Apparently, the persistence of elevated sympathetic activity is one of the major contributors to the onset, development and maintenance of neurogenic arterial hypertension (AHT). From experimental models of hypertension and hypertensive patients data using microneurography and norepinephrine spillover techniques, there is evidence that the sympathetic influence upon the cardiovascular system is often increased when blood pressure is chronically elevated. The mechanisms responsible for the sympathetic activation in essential hypertension are complex and multifactorial and remained to be completely elucidated. However, several working hypothesis can be discussed, some of them stressing the role of humoral substances and others concentrated on brain mechanisms.

The most mentioned sympathetic excitatory regions are the paraventricular nucleus of the hypothalamus (PVN). The PVN has emerged as one of the major regulators of the coordinated autonomic and endocrine output. PVN projects to both rostral ventrolateral medulla (RVLM) and the spinal sympathetic intermediolateral nucleus, and PVN neurons stimulation increases RVLM activity and arterial blood pressure. Several PVN neurons that project to RVLM also display an intrinsic auto-rhythmicity, and the discharge frequency correlates closely with sympathetic discharge rate. The extensive projections of the PVN to central regions (RVLM, area postrema, NTS and intermediolateral nucleus of the spinal cord) indicate that PVN plays a significant role in modulating RVLM activity and sympathetic outflow.

The PVN receives input from a large number of regions in the brain, including those associated with osmotic control, appetite, energy metabolism, stress, emotions and other areas that exert effects on BP. Thus, it is clear that the role of the PVN is to integrate inputs from a variety of sources and modify RVLM activity according.

It was also showed that electrolytic lesions of the PVN in spontaneously hypertensive (SHR) rats elicited an acute reduction of sympathetic activity together with a decrease of blood pressure. Other acute animal studies, performed under general anaesthesia, showed that PVN muscimol injections lowered BP and renal sympathetic nerve activity both in SHR and Wistar-Kyoto rats, indicating that this region was tonically active in both animal strains to control BP and peripheral sympathetic activity. Moreover, the relation of PVN and RVLM neurons to sympathetic control suggests that the spontaneous discharge can be modified