



indicators are important homeostatic parameters for postnatal adaptation in terms of energy balance of newborns. In case of further staying of these children with a variety of disabilities and metabolic disorders in the intensive care department additional biochemical indicators may be the determination of the activity of enzymes ALT [EC 2.6.1.2] and AST [EC 2.6.1.1], the level of urea and creatinine, bilirubin and its fractions, C-reactive protein.

The objective of our study was to investigate the levels of total protein and glucose in umbilical cord blood and in fetal blood (in case of re-appointment) and activity of aminotransferases (ALT, AST) and possible correlations between them. Unified generally accepted techniques were used in defining of these metabolites in the serum: total protein – biuret method, glucose – glucose oxidative method, enzyme – kinetic method without pyridoxal phosphate. Photocolorimeter "Solar" PM-1111 and semi-automatic analyzer BA-88 "Mindrey" were used to measure the quantities. The serum material «Cormay Serum HP» (REF 5-173; Lot 05-510F) manufactured by «Cormay» (Poland) was used to control the accuracy and reliability of the results. Statistical analysis was performed with the help of determining average values of indicators and their standard deviation, using different groups to compare nonparametric analysis methods, the criteria of Spearman (rank correlation coefficient to detect distress communications between indicators), U-Whilkokson-Mann-Whitney, T-Whilkokson (in comparison with the indicators that were measured in different conditions in the same group (umbilical cord blood and venous fetal blood).

The average content of total protein was within 49.6 g/L, glucose - 4.2 mmol/L. Comparing these indicators between singletons and twins on the basis of Whilkoksona-U-Mann-Whitney criterion it was found out that they were within the same limits regardless of a number of developing fetuses.

Moderate neonatal hypoglycemia was revealed only in 7.8% of the examined newborns (results were within 2.2 - 2.6 mmol / l). Almost half of these results belonged to twins.

The quantity of definition of concentration values of total bilirubin and enzyme activity are significantly lower than total protein and glucose indicators, because they were additional markers to characterize the functional state of the organism in terms of biochemical changes (tab.).

Table

The concentration of some biochemical parameters in the blood of children in the early postnatal period

Newborns (n=120)	levels (M + m)				
	total protein(g/L)	glucose (mmol/L)	total bilirubin (μmol/L)	AIAT IU/L	AsAT IU/L
	49,60 ± 0,78	4,20 ± 0,12	40,39 ± 2,21 (n=40)*	26,4 ± 2,3 (n=24)*	57,6 ± 4,8 (n=24)*

* - definitions of total bilirubin concentration and enzyme activity.

Quite high levels of glucose were noticed by us in two umbilical cord blood of newborns from mothers with insulin-dependent type of diabetes, 9.2mmol/L (2014) and 9.8 mmol/L (2016).

This indicator met the standard values according to the second analysis which were carried out by medical personnel of neonatology department (for glucose test-system) during the first 24-30 hours of life.

Determination of enzyme activity was generally conducted in fetal's blood according to the table the activity of AsAT is twice bigger than the activity of ALT, that corresponds to the literature sources on this particularly subject. AST activity indicator is generally characterized by significantly higher vibrations that reached the limits of 38.6 to 112.7 IU / L, in comparison with the activity of ALT (variable limits from 18.6 to 49.4 U / L).

The correlation between the total protein and glucose level was not found according to our researches. But there is a relationship between the level of bilirubin and urea ($r = 0.57$), between bilirubin and creatinine ($r = 0.57$), moderate level between urea and creatinine ($r=0.40$) in venous blood of newborns.

Thus, the state of physiological jaundice may occur on the background of unformed enzyme systems of the liver. The relationship between nitrogen metabolism and pigment may indicate the formation of important functional organ systems during the adaptation period in early postnatal life. Certain correlation interactions are essential in the regulation of the basic metabolic ways of the organism.

In further studies, the definition of rank correlation and relationship between these biochemical indicators can be valuable prognostic criteria to characterize the metabolic changes in infants, as the number of appointments on biochemical parameters increases every year.

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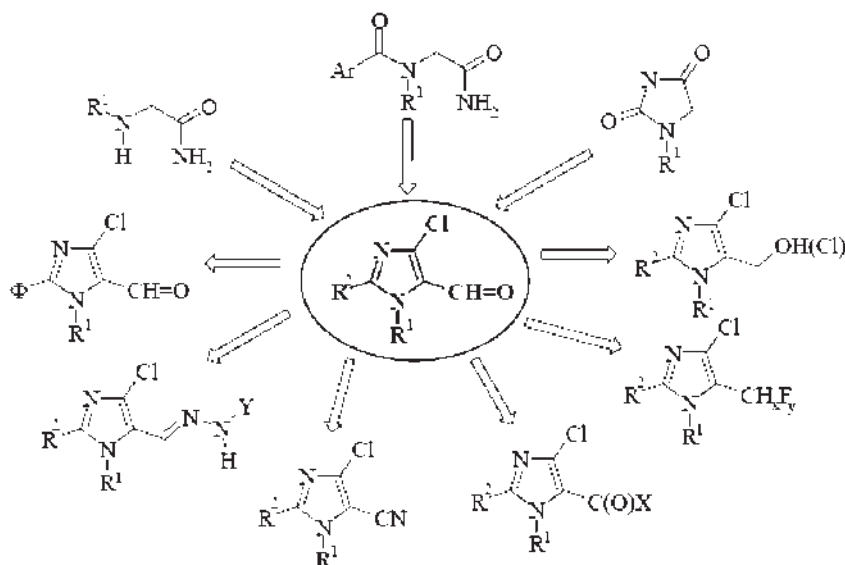
5-CARBOFUNCTIONALIZED IMIDAZOLES AND THEIR DERIVATIVES: SYNTHESIS AND BIOMEDICAL INVESTIGATION

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Since one structural fragment of imidazole can be classified as a natural compound, some potential physiological activity can be expected for its derivatives. That is why the functionalized imidazoles are widely used as synthetic blocks to construct new bioactive compounds. Modern approaches in the field of targeted synthesis of bioactive compounds have demonstrated the prospects to create new medicines by means of modification of the imidazole cycle by bioactive functional groups. This approach is especially effective in synthesis of the compounds with a wide pharmaceutical activity.



A targeted functionalization of the imidazole cycle with some pharmacophore fragments has been performed in the 2nd, 4th and 5th positions on the basis of a wide range of imidazole derivatives containing some groups facilitating further structural modification. Bioscreening of a considerable number of synthesized substances showed that this type of imidazoles are effective systems for further more detailed investigation of the leading compounds to develop highly effective drugs.



R¹ = Alk, Ar; R² = H, Cl, Br, Ar, OAlk, SAlk, NAlk, N₃, NH₂; Φ = OAlk, SAlk, NAlk, N₃, NH₂

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THE INFLUENCE OF MELATONIN ON GLUTATHIONE-S-TRANSFERASE ACTIVITY IN THE KIDNEYS OF RATS UNDER ALLOXAN-INDUCED DIABETES

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Diabetes mellitus is the most common endocrine disease. Experimental model of alloxan diabetes is an example of free radical pathology and is accompanied by impairment of oxidant-antioxidant balance in animals. Melatonin is one of the most powerful endogenous antioxidants, along with the fact that it stimulates glucose utilization in tissues, increases the concentrations of ATP and creatine phosphate, stimulates deposits of glycogen in the tissues.

The aim of the research was to assess changes of glutathione-S-transferase activity in the kidneys of rats under the experimental alloxan-induced diabetes and administration of melatonin.

Experiments were performed (conducted) on 50 mature white male rats with body weight 160-180 g. Alloxan-induced diabetes was induced by intraperitoneal injection of 5% solution of alloxan monohydrate in the dose of 150 mg/kg. Animals were divided into groups: 1) control animals; 2) animals with manifested diabetes (basal glycemia 12,8-17,2 mmol/l); 3) animals with manifested diabetes which underwent intragastric administration of melatonin daily in the dose of 10 mg/kg at 8.00 a.m. The animals were decapitated under light ether anesthesia on the 7th and the 14th day of the drug administration. In post-nuclear supernatants of homogenates of renal cortical layer activity of glutathione-S-transferase was measured. The results were processed statistically using nonparametric methods of variation statistics using STATISTICA 7.

It has been found out, that an experimental model of alloxan-induced diabetes was accompanied by increased activity of glutathione-S-transferase in cortical layer of the rats' kidneys by 43% and 95% above the control on the 7th and the 14th days of the experiment respectively. The increase of glutathione-S-transferase activity in the kidneys of diabetic rats probably is related to increased disposal of secondary products of lipid peroxidation and other oxidized substances due to conjugation with glutathione.

Administration of melatonin to animals with alloxan-induced diabetes caused decrease of glutathione-S-transferase activity in the kidney in comparison with untreated animals, but it remained higher than the level of control animals on the 7th day on 30%, on the 14th day on 37%.

Antioxidant properties of melatonin are likely related to both direct disposal of reactive oxygen species and the influence of melatonin on the expression of genes that are responsible for synthesis of antioxidant enzymes.