Background. Nucleotides are stable monomers of nucleic acids. They are required for a wide variety of biological processes and are constantly synthesized in all the cells. As cells proliferate, increased nucleotide synthesis is required for DNA replication and RNA production to support protein synthesis at different stages of the cell cycle, during which these events are regulated at multiple levels. Therefore, the synthesis of previous nucleotides is also strongly regulated at several levels.
Case report. In order to keep the quantity of nucleotides constant, the cell uses two important pathways: 1. novo synthesis 2. nucleotide repair with reuse of metabolic residues from pre-existing nucleotides. However, despite the existence of different repair pathways, most proliferative cells synthesize nucleotides and de novo nucleic acids, mainly from glucose, glutamine and CO_2. This was observed by using C^{13} and N^{15} labeled isotopes. Different parts of nucleotides come from different sources of carbon and nitrogen in the cell, and the RNTP (ribo-nucleotide-triphosphate) assembly requires a great amount of energy. Thus, starting from glucose, three equivalents of ATP are required to make activated ribose-5'-phosphoribosyl pyrophosphate (PRPP), which is produced by the reaction between 5'-phosphoribose with ATP, caused by the release of the 5'-AMP group. Pyrimidine rings are first synthesized in the form of uracil from aspartate, CO_2 (or bicarbonate) and glutamine, which require two ATP. Metabolic requirements for nucleotides and their bases can be met either by energy input or by de novo synthesis from precursors with low molecular weight. The ability to save nucleotides in the body alleviates any significant nutritional needs for nucleotides, so purine and pyrimidine bases are not required as part of the diet. The repair pathways are a major source for DNA, RNA and enzyme co-factors synthesis. Inside the body, the main system for de novo nucleotide synthesis, for the renewal and maintenance of intracellular pools, is the liver. After their synthesis in the liver, the nucleotides are dephosphorylated, next partially phosphorylated in nucleobases and ribose-1-phosphate for transport to the blood and subsequently uptake by the other cells. These processes are regulated at transcription level by a set of main transcription factors, but also at the level of the enzyme by allosteric regulation and feedback inhibition. Studies based on labeled isotopes provide important information on nucleotide biosynthesis, such as the preference for endogenously synthesized precursors, such as glycine and aspartate, compared to those provided externally, and how resources are re-allocated based on environmental conditions, particularly pathological conditions such as cancers ("metabolic reprogramming").
Conclusions. Almost all cells in the body are capable of synthesizing de novo nucleotides. The source of these molecules may be nucleic acids of their own tissues and foods, but these sources have only a secondary, auxiliary value.
Key words: nucleotide, repair, denote, labeled isotopes

3. HYPERPARATHYROIDISM IN THE CONTEXT OF MULTIPLE ENDOCRINE NEOPLASTIC SYNDROMES

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Background. Multiple endocrine neoplastic syndromes (Multiple Endocrine Neoplasia - MEN) are a group of disorders characterized by simultaneous or successive association of hyperplastic or tumoral lesions, usually benign or malignant, usually hypersecretory, at least involving two endocrine glands, without obvious functional interrelations. MEN 1 is one of the three distinct types of MEN that affect the parathyroid glands, endocrine pancreas and anterior pituitary gland. Parathyroid glands are the first and most commonly affected by MEN 1 (95%). The diagnosis can be established before the age of 20 by identifying some suggestive signs – recurrent urinary lithiasis, muscle or bone pain. All patients with MEN should be registered and supervised throughout life, given that the tumors remain asymptomatic for a long time.

Case report. Patient X, age 48, has been suffering for approximately 20 years for kidney stones. Was operated on parathyroid, then had consecutive surgeries on the kidneys, and in 2015 started the treatment with hemodialysis. In the meantime, hyperprolactinemia has been identified, and pituitary adenoma has been described on MRI. For the moment, the Patient X is on a complex pathogenic treatment.

Conclusions. 1. Parathyroid adenoma is commonly found in polyglandular neoplastic syndromes. 2. Hyperparathyroidism once diagnosed, it is necessary to differentiate primary, secondary or tertiary type in order to establish prompt treatment tactics and to prevent complications. 3. The complex approach of the patient with hyperparathyroidism is essential.

Key words: hyperparathyroidism, MEN 1, pituitary adenoma, hemodialysis.

DEPARTMENT OF PEDIATRIC SURGERY, ORTHOPEDICS AND ANESTHESIOLOGY

4. ASSOCIATION OF ULTRASHORT SEGMENT HIRSCHSPRUNG DISEASE WITH A RARE GENETIC PATHOLOGY – TOWNES-BROCKS SYNDROME

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Background. In our case we have find an association of two different pathologies - Townes-Brocks syndrome (TBS) and Hirschsprung's disease (HD). TBS is a rare autosomal dominant disease (1/250000 newborns), caused by mutation of the gene SALL1. There is approximatively 200 descripted cases in the special literature. The main symptoms are: malformations of the external ear (by dimensions, form, insertion, presense of preauricular rudimentary tags), anorectal malformations (imperforated anus, anal atresia, anal stenosis), heart and renal malformations, limb's abnormalities (three-articular thumb, syndactyly, overlapping fingers). TBS can be diagnosticated in base of simultaneously presense of major symptoms triad, sometime without genetic research. The Ultrashort Segment HD is a controversial form of aganglionosis wich involves 2-4 cm of distal rectum and anal canal. It is characterized by latent debut, lack of classical radiological interpretation and negative recto-anal reflex by manometry. The treatment of Ultrashort Segment HD is also controversial. Some