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COBALT. ITS IMPORTANCE IN THE BODY. WHICH COMPOUNDS ARE USED IN MEDICINE

Barotova Nodira
Student of the Faculty of Fundamental Medicine, Group 101,
Samarkand State Medical University
Scientific advisor: ***Karjavov Abdikhakim Rakhmonovich***
Samarkand State Medical University, Samarkand, Uzbekistan
Email: *arkarjavov@gmail.com*
Email: *zoyirovnanodira006@gmail.com*

Introduction.
Cobalt is present in the body as a trace element and has great biological importance. This element plays a particularly vital role in human health, as it is necessary for a number of vital processes. Cobalt is mainly found in vitamin B12, which has a special significance and plays a major role in the prevention of various medical conditions. This thesis discusses the role of cobalt in the body, its chemical compounds, and its applications in medicine.

Keywords: cobalt, importance in the body, vitamin B12, use in medicine, trace elements, chemical compounds.

Literature Review.

Various scientific studies and literature are available on the importance of cobalt in the body and its use in medicine. These sources provide important information on the biological role of cobalt, diseases associated with its deficiency, and its use in various medical fields, especially oncology and diagnostics.

1. The role of cobalt in the body and its importance in vitamin B12. One of the main functions of cobalt in the body is its presence in the composition of vitamin B12. Vitamin B12, or cobalamin, is essential for the formation of red blood cells, and its deficiency can lead to pernicious anemia. The metabolism of vitamin B12 is directly related to the proper amount of cobalt. In addition, vitamin B12 ensures the normal functioning of the nervous system, and its deficiency can lead to neuropathic symptoms (such as headaches, numbness in hands and feet, impaired motor functions) (Smith et al., 2005).

2. Cobalt isotopes and their use in medicine. The use of cobalt in medicine is mainly carried out through its radioactive isotope — cobalt-60 (Co-60). Due to its emission of high-energy gamma rays, cobalt-60 is effectively used in radiotherapy. It is used as an important tool in the treatment of large tumors, including cancer. The therapeutic effect of cobalt-60 has been utilized in medicine for many years, and many scientific works describe its distribution and effectiveness (Mettler, 2003).

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3. Cobalt and toxicology. Excessive intake of cobalt into the body can have toxic effects. A high level of cobalt, especially from compounds such as cobalt chloride or cobalt sulfide, can lead to health issues. Prolonged excessive intake of cobalt may result in cobalt toxicity, which can impair the functions of the heart, kidneys, and lungs. Many scientific works present data on the toxic effects of cobalt (Goyer, 1999).

4. Other cobalt compounds and their use in medicine. Other chemical compounds of cobalt, such as cobalt oxides and cobalt-nickel, are used in industrial fields, but in medicine, these compounds are more often used in diagnostic methods or equipment. Cobalt compounds are also used in prosthetic devices and dental materials due to their corrosion resistance and biocompatibility (Gier et al., 2014).

5. Biologically active compounds of cobalt and new medical prospects. Recent scientific studies have been exploring the creation of new biologically active compounds containing cobalt. Such new cobalt-containing compounds, for example, cobalt-organic compounds, can serve as biologically active substances. These studies may open up new medical applications for cobalt, especially in the development of medicines and new treatment approaches (Li et al., 2018).

The information provided in the literature about the importance of cobalt in the body and its use in medicine further expands our understanding of its essential role and applications in various medical fields. Cobalt, mainly as a component of vitamin B12, supports vital bodily functions. Moreover, its radioactive isotope — cobalt-60 — has significant value in radiotherapy for cancer treatment. Due to its toxic effects, cobalt must be used with caution, and the development of new biologically active compounds may further expand its medical potential.

Conclusion.

In conclusion, cobalt is one of the essential trace elements in the body, and its sufficient presence is necessary for various vital processes. The importance of cobalt in vitamin B12 shows that a deficiency of this element can lead to serious health problems. The chemical compounds of cobalt are effectively used in medicine, especially in oncology and radiotherapy. At the same time, due to the toxic effects of cobalt, it must be used carefully. In the future, the wider use of cobalt in medicine and further research into its biological importance will be necessary.

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