

Abstract: **Less common metabolites of steroid hormones in human physiology and pathophysiology**

Not long ago, they have been less common steroid metabolites regarded as mere degradation products of steroid metabolism. Since the last decades, it has been discovered that these substances, which are occurring in the human organism at Nano molar concentrations, are involved in the regulation of physiological processes, such as the immune response, thermoregulation, development of cancer and activity against the major steroids.

As the introduction, the presented thesis provides an overview of published data dealing with the less common metabolites of steroids. Experimental part is based on partial studies whose objectives were chosen in such a way to help reveal some of the missing intermediate steps in the mechanism of steroid hormones action.

Because these steroids occur in only Nano molar concentrations, the highly sensitive and specific methods such as radio-immuno assay (RIA), gas chromatography combined with mass spectrometry (GC-MS) and high performance liquid chromatography (HPLC) had to be used.

In the case of metabolites 16α -hydroxy-dehydroepiandrosterone and 7-oxo-dehydroepiandrosterone, we developed and statistically evaluated two novel RIA methods. These rapid and sensitive methods suitable for screening purposes were used to determine the normal range of values in a statistically significant sample of the healthy population.

In the study we investigated steroid parameters and sex hormone-binding globulin (SHBG) in patients with congenital adrenal hyperplasia. However, we could not show that featured non-steroid SHBG laboratory parameter reflects the effectiveness of substitution treatment in these patients. In addition, we used a new HPLC separation method to determinate five sex hormones (testosterone, dihydrotestosterone, epitestosterone, androstenedione and estradiol) in samples of testicular tissue. For women in the last trimester of pregnancy, we observed increased production and decreased catabolism of progesterone with the upcoming birth. Last but not least, we implied the alternative mechanism of biosynthesis of progesterone, which may be related to the presence of the enzyme with redox activity in the placenta.

All sub-study were opposed and accepted for printing in foreign as well as domestic scientific journals.