Despite the great number of researching works and the wide implementation of new methods of topical diagnosis allowing not only to detect adrenal glands incidentalomas (AI), but describe them, the issue of the differential diagnosis of benign and malignant AI is still not thoroughly worked out.

**Materials and research methods.**

333 patients from 18 to 84 year old that appealed to the State Institution “V. Komisarenko Institute of Endocrinology and Metabolism of NAMS of Ukraine” for the first time in connection with the detection of adrenal glands incidentalomas were examined.

All patients were subjected to the complex check-up which included general clinical, special laboratory (blood test for cortisol, adrenocorticotropic hormone, aldosterone, renin, aldosterone-renin ratio, dehydroepiandrosterone sulfate, testosterone; daily urine analysis for cortisol and metanephrines) and instrumental (ultrasonography and computed tomography) research methods.

**Results and their discussion**

Among the examined patients with AI the percentage of hormonally inactive tumors was 68.8% (n=229). Except the hormonally inactive tumors, 19 (5.7%) patients had cortisol-secreting adenomas, 10 (3.0%) – aldosteromas, 5 (1.5%) – androgen-secreting adrenal tumors, 13(3.9%) – adrenocortical carcinomas, 39 (11.7%) – pheochromocytomas. Among other adrenal glands tumors there were 12 (3.6%) cysts, 3 hematomas, 1 hemangioma, 1 lipoma, 1 fibroma.

The conducted analysis of patients’ complaints was insufficient for detecting reliable specific complaints befitting the majority of adrenal glands incidentalomas and which could be their pathognomonic symptom.

During the analysis of the patients’ complaints remoteness precise regularities were not found. This fact is explained by the accidental detection of the adrenal glands tumors absolutely not connected with the availability of the complaints. Although the majority of the patients with hormonally inactive adrenocortical adenomas – 140 (61.1%) – the clinical symptoms were absent or the remoteness of non-specific complaints exceeded 5 years. In contrast with this remoteness of complaints in the majority of cases (10 people, 76.9%) they didn’t exceed 5 years in patients with AI which were verified as malignant that may be connected with the invasiveness or tumor intoxication.

15 (79%) patients with corticosteromas had hyper daily secretion of cortisol with urine with its average level at 623.2±48.0 mcg/24hours. Hypercortisolemia with its average level of
29.6±2.7 mcg/dl was peculiar to 17 (89.5%) patients. Level of adrenocorticotropic hormone in the patients of this group in the majority of cases (14 people, 73.7%) didn’t exceed the referential limits.

As a screening test for the diagnosis of the primary hyperaldosteronism aldosterone-renin ration was determined. The fact that patients had hyperaldosteronism was verified by the high level of aldosterone and aldosterone-renin ratio.

During analysis of the laboratory indices that patients with androsteromas had the increasing of dehydroepiandrosterone sulfate was found in three cases, in two ones the level of dehydroepiandrosterone sulfate was on the upper limit of the norm.

Among our patients with AI the percentage of malignant tumors was 3.9% (13 patients) which means that every twenty fifth patients had malignant AI. Adrenocortical cancer made up 3.0% (10 patients) among AI, metastases in adrenal glands – 0.9% (3 patients). According to our data laboratory indices that patients with malignant AI had didn’t exceed the referential limits.

Among 333 examined patients with AI 39 people (11.7%) had tumors of the adrenal glands medullary substance among, which 7 people (18%) had pheochromoblastomas. According to the results of the laboratory researching works 35 patients (89.7%) had the increased level of the common metanephrines in the daily urine that averagely made up 969.8±334.5 mcg/24 hours. The increasing of the level of the common metanephrines in the daily urine had 8 patients (3.5%) with nonchromaffin genesis tumors, that were verified as hormonally inactive adenomas. The average level of metanephrines in the daily urine of patients with nonchromaffin genesis tumors made up 377.3±27 mcg/24 hours which is 3.3 times lower in comparison with this index that patients with AI that were later on verified as tumors of the adrenal glands medullary substance had.

During the analysis of the results of adrenal glands ultrasonography differentially diagnostic ultrasonic criteria were used such as the size of the AI more than 6 cm, irregular form, vague outlines, the presence of the invasion, lymphadenopathy, regional and/or remote metastases. Among 13 patients with AI that were later on verified as malignant tumors it was possible to diagnose malignant involvement that had 11 people (84.6±10.0%) with the help of this method. Among the patients with AI that were later on verified as adenomas similar “criteria of malignancy” had only 16 (13.3±3.1%) people among 120 patients (false-positive results). Ultrasonic characteristics of pheochromocytomas didn’t differ a lot I comparison with the similar characteristics of the adenomas.
The results of the 213 computer tomographies (CT) were analysed. Among them there were 143 patients with AI that were later on verified as adenomas, 13 – with AI that were later on verified as malignant tumors, 39 – with AI that were later on verified as medullary substance tumors, 12 – verified as cysts, 3 – verified as hematomas, 1 – lipoma, 1 – fibroma, 1 – hemangioma. During the analysis of the results of the adrenal glands CT differentially diagnostic criteria were used such as the size of the AI, form, outlines, native and contrast density, concentration gradient, the presence of the invasion, lymphadenopathy, regional and/or remote metastases.

In comparison with ultrasonography CT is more precise and efficient method of AI topical diagnosis. This method of topical diagnosis not only to measure the outlines, limits, the inner structure of AI and in such way to conclude about its nature but the characteristics of the formation with the aim of differential diagnosis of sound and malignant tumors. Contrast density \(>50\) HU and/or density gradient \(\geq 20\) HU verify the proliferative and metabolic activity of tumors, hence, this AI should be treated as the formation that has high malignant potential. Contrast density \(\leq 50\) HU and density gradient \(<20\) HU along with vague outlines, irregular AI forms, clear sign of invasion and lymphadenopathy also say about the potential malignancy of AI.

**Conclusions**

1. Specific complaints, with the help of which adrenal glands formations could be suspected and that could be their pathognomonic sign are absent.
2. Ultrasonography has advantages as a screening method.
3. Contrast density \(> 50\) HU and/or density gradient \(\geq 20\) HU confirm the proliferative and metabolic activity of the tumors.
4. Differentially diagnostic CT criteria of malignancy, such as the size of the AI more than 6 cm, irregular form, vague outlines, contrast density \(>50\) HU and/or density gradient \(\geq 20\) HU, the presence of invasion, lymphadenopathy, regional and/or remote metastases, enable to diagnose the malignant involvement.
5. During the detection of AI of the solid structure that has tomographic density less than 26 HU, false-positive increasing of the level of metanephrines in daily urine may occur.