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Features of metabolic syndrome in patients with adrenal incidentalomas

Cechy zespołu metabolicznego u pacjentów z incydentaloma nadnerczy

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A – Study Design, B – Data Collection, C – Statistical Analysis, D – Data Interpretation, E – Manuscript Preparation, F – Literature Search, G – Funds Collection

Summary Background. Incidentally discovered adrenal tumors have become a common clinical problem. Patients with adrenal incidentalomas frequently display many features of metabolic syndrome.

Objectives. The aim of the study was to identify features of metabolic syndrome in patients with adrenal incidentalomas.

Material and methods. The studied group involved 300 (213 F; 87 M) patients aged 23–85 yrs (mean 62 yrs) hospitalized in one department between 2011–2013 for incidentally discovered adrenal tumors. Retrospective analysis based on clinical picture and results of imaging and laboratory procedures was conducted. Certain features of MS such as obesity (based on higher BMI), hypertension, abnormal parameters of glucose and lipid metabolism were assessed.

Results. Excessive body mass was observed in about 80% of patients: half of them were overweight and half – obese. Hypertension was observed in 72% of patients. Abnormal glucose tolerance was found in 119 (39.7%) of subjects. In this group pre-diabetes was diagnosed in 30% and type 2 diabetes in over 60% cases. Low HDL was found in 22.5% and increased triglyceride level in about 40% of them. No features of metabolic syndrome were observed only in 9 patients and 16 subjects had all 5 symptoms present. Hypertension, glucose intolerance and excessive body mass was simultaneously present in over 40% patients.

Conclusion. Patients with incidental adrenal mass are characterized by high prevalence of metabolic syndrome features and because of an increased risk of cardiovascular disease and type 2 diabetes mellitus they should be closely monitored to introduce necessary treatment as early as possible.

Key words: adrenal incidentaloma, metabolic syndrome.

Streszczenie Wstęp. Przypadkowo wykryte guzy nadnercza stały się częstym problemem klinicznym. U chorych z incydentaloma nadnerczy często stwierdza się cechy zespołu metabolicznego.

Cel pracy. Ocena częstości występowania niektórych cech zespołu metabolicznego u chorych z incydentaloma nadnercza.

Materiał i metody. 300 chorych (213 K; 87 M) hospitalizowanych w klinice w latach 2011–2013. Przeprowadzono retrospektywną analizę obrazu klinicznego, badań laboratoryjnych i obrazowych. Oceniano masę ciała (BMI), ciśnienie krwi, tolerancję glukozy i profil lipidowy.

Wyniki. Nadmierną masę ciała stwierdzono u 80% chorych, odpowiednio u połowy nadwagę i u połowy otyłość. Nadciśnienie rozpoznano u 72% chorych. Nieprawidłową tolerancję glukozy zdiagnozowano u około 119 (39,7%) chorych, w tym stan przedcukrzycowy u około 30%, a cukrzycę typu 2 u ponad 60%. Obniżone stężenie HDL stwierdzono u 22,5%, a podwyższony poziom trójglicerydów u około 40% chorych. Tylko 9 chorych nie prezentowało żadnej cechy zespołu metabolicznego, natomiast u 16 z nich były obecne wszystkie 5 równocześnie. Nadciśnienie, nietolerancję glukozy i nadmierną masę ciała miało powyżej 40% chorych z badanej grupy.

Wniosek. Pacjentów z incydentaloma nadnerczy charakteryzuje duża częstość występowania cech zespołu metabolicznego. Z powodu zwiększonego ryzyka sercowo-naczyniowego i cukrzycy typu 2 powinni oni podlegać czujnemu nadzorowi metabolicznemu, żeby odpowiednio wcześniej wdrożyć adekwatne leczenie.

Słowa kluczowe: incydentaloma nadnerczy, zespół metaboliczny.

Background

Incidental adrenal tumor (*adrenal incidentaloma* – AI) has been detected more and more frequently by adrenal ultrasound or computed tomography performed for indications unrelated to adrenal pathology. AI has become a common clinical problem that is most often detected in patients over 60 years old, with two times higher frequency in females [1, 2].

Patients with adrenal incidentalomas frequently display many features of metabolic syndrome (MS) [3, 4]. A higher prevalence of obesity, diabetes mellitus and hypertension coexisting with secreting and non-secreting adrenal incidentalomas was observed by some authors [3–7].

The diagnosis of MS is extremely important because of its correlation with an increased risk of cardiovascular disease and type 2 diabetes mellitus [4–6].

Objectives

The aim of the study was to identify features of MS in patients with adrenal incidentalomas.

Material and methods

The studied group consisted of 300 patients aged 23–85 yrs (mean 62 yrs), 213 females and 87 males, hospitalized in authors' department between 2011–2013 for incidentally detected adrenal tumors. Clinical pictures, imaging results and hormonal tests were analyzed retrospectively. Certain features of MS such as obesity (based on higher BMI), hypertension, abnormal parameters of glucose and lipid metabolism were assessed.

Results

Results are presented in Table 1–4. Excessive body mass was observed in about 80% of patients with AI; half of them were overweight and half – obese (Tab. 1).

Hypertension (diagnosed or already treated) was found in 72% of patients (Tab. 2). Impaired glucose metabolism was found in 119 (39.7%) patients. In this group pre-diabetes was noted in about 30% patients and type 2 diabetes in over 60% patients. Lipid disorders were found only in 178 patients (59%). In this group decreased HDL level was found in 40 cases (22.5%), and increased triglyceride levels in 67 patients (37.6%).

Table 1. Body mass in group of patients with adrenal incidentaloma

Body mass	Number of patients	%
normal	62	20.6
overweight	120	40
obesity	118	39.4
Only patients with abnormal body mass	238	100
overweight	120	50.4
obesity	118	49.6

Table 2. The frequency of normal blood pressure and hypertension in studied group

Hypertension	Number of patients	%
present/treating	216	72
normotension	84	28

Table 3. Lipid disorders in the group of patients with adrenal incidentaloma

Triglycerides	Number of patients	%
lack of data	122	40
studied	178	
normal < 150	111	62.4
increased ≥ 150	67	37.6
HDL	Number of patients	%
lack of data	122	40.6
studied	178	
decreased	40	22.5
normal	138	77.5

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In the study group only 9 patients had no features of MS, 16 of them had all 5 features. In the group of 235 (78%) patients with excessive body weight 107 patients (45.5%) had impaired carbohydrate metabolism, 186 patients (79.2%) hypertension and 98 (42%) patients had all three, i.e. excessive body weight, hypertension and improper glucose tolerance.

Table 4. Glucose tolerance in adrenal incidentaloma patients

Glucose tolerance	Number of patients	%
normal	181	60.3
impaired	119	39.7
type 1 diabetes	3	2.5
prediabetes	39	32.8
type 2 diabetes	77	64.7

Discussion

In the last decade a lot of research into correlation between metabolic syndrome and adrenal incidentalomas has been performed [3–6]. However it remains unexplained, whether adrenal incidentaloma alone could account for the development of metabolic disorders. Yener et al. [6] demonstrated that subjects with nonfunctioning adenomas had several metabolic disorders, in both anthropometric and laboratory indices during 24-months' follow-up. They observed significant increase in the prevalence of dislipidemia, hypertension and pre-diabetes and suggested that autonomous cortisol secretion might be responsible for that, a phenomenon as subtle that it is below the possibility of detection by routine laboratory investigations [6]. Several studies [3–7] reaffirmed high prevalence of obesity, hypertension, hyperlipidemia and diabetes mellitus or glucose intolerance in subjects suffering from adrenal incidental tumors. Kolańska et al. [7] reaffirmed a strong association between obesity and incidentally detected non-functioning adrenal tumors with prevalence of 40%. Present results are comparable with the reports by other authors and support high frequency of features of metabolic syndrome in patients with clinically unapparent adrenal mass.

Conclusion

Patients with incidental adrenal mass are characterized by high prevalence of metabolic syndrome features and because of an increased risk of cardiovascular disease and type 2 diabetes mellitus they should be closely monitored to introduce necessary treatment as early as possible.

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