Original Article

Survey of the relative frequency of Adrenal masses in patients referring to outpatient endocrinologist clinics of Ahvaz city between 2008-2018

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Abstract

Background: Increased function of the adrenal cortex creates three main groups of clinical syndromes related to elevated hormone levels: Cushing's syndrome, hyperaldosteronism, and a number of androgenic syndromes. Adrenal mass included: benign and malignant cortical tumor, medullary tumor and others benign lesion. The prevalence of adrenal mass is very different. Therefore, the aim of this study was to determine the prevalence of adrenal masses and assess the clinical, radiological and biochemical characteristics of patients with adrenal masses referring to the Outpatient Clinic to appropriate treatment was designed. Materials and methods: This is a cross-sectional retrospective study in which out of the 100,000 cases in outpatient clinics, 50 patients with adrenal masses that was recruited between 2008 and 2018 was isolated. Patients' information was collected and analyzed using a checklist including age, sex, pathology of the adrenal mass, adrenal mass size, biochemical of the hormones, blood pressure, and the symptom referring to them and the size of the adrenal mass. Data analysis was performed using SPSS V.22 software. The level of significance was also considered as $p < 0.05$. Results: Of the 50 patients, 32 was female (64%) and 18 (36%) was male. The mean age was 55.66 years for adrenal carcinoma patients and 40.25 years for benign adenoma. 8% was malignant lesions and 92% was benign lesions. . The most common symptom in patients was hypertension (40%) and then asymptomatic patient (24%). non-functional masses was most frequent (54%), followed by benign adenoma (18%). The ferquency of the right adrenal mass (54%) was higher than the left side (40%). 72% of the patients had an adrenal mass less than 4 cm, and all patients with adrenal carcinoma had a mass size greater than 4 cm. in benign adenoma, frequency of smaller than 4 cm in mass size was higher(77.77%). Conclusion: Given the increased frequency of adrenal masses during these 10 years, suspected patient should undergo hormonal and radiological studies. With early diagnosis and treatment, it is possible to prevent the progression of these lesions and reduce the mortality and morbidity.

Keywords: Adrenal mass, relative frequency, pathology

Introduction

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Increased function of the adrenal cortex creates three main groups of clinical syndromes related to elevated hormone levels: Cushing's syndrome, hyperaldosteronism, and a number of androgenic syndromes [1]. Adrenal mass included: benign and malignant cortical tumor, medullary tumor and others benign lesion [2]. The prevalence of adrenal mass is very different so that it is less than 1% less than 30 years old and increases to 7-10% at ages more than 70 years[3]. Cushing's syndrome and hyperaldosteronism are often associated with functional adenoma and an adrenergic neoplasm that tend to become carcinoma [1]. Some adrenal

glands have no hormonal function and they are thrown with pain or abdominal mass [4]. Determining the functionality of a cortical neoplasm is possible based on clinical evaluation and measuring the hormone or its metabolites in the laboratory. Differentiation is not possible with morphology characteristics [4, 5]. Most cortical adenomas are non-functional masses that are incidentally found in atopy or abdominal radiography [6, 7]. These masses are present in 2-3% of the total population, and as their age increases from 1% at age 40 to 7% at the age of 70 [8]. Adrenal deposits include a range of asymptomatic cysts to fatal carcinoma. The most common benign adrenal mass is pheochromocytoma and adrenal adenoma, and the most common malignant tumor is adrenocarcinoma and neuroblastoma [9]. Therefore, this study was designed to determine the prevalence of adrenal masses and to assess the clinical, radiological and biochemical characteristics of patients referred to outpatient clinics of Ahwaz in order to appropriate treatment in these patients.

Materials and Methods

This retrospective study was performed on patient's adrenal cortex referring to endocrinologist specialist centers between 2008-2018 throughout Ahwaz city, which was approved by radiologist or general surgeon or other internal experts. Patients' data were collected from medical records in these centers by a checklist including age, sex, and pathology of the adrenal mass, adrenal mass size, biochemical hormones, blood pressure, and symptom referring to them. The size of the adrenal mass will be analyzed by CT scan that is confirmed by the radiologist. The biochemical information of hormones also includes baseline tests: urine Cortisol Level, ACTH Plasma, Serum DHEA-S, 17 Hydroxy progesterone, Serum Aldosterone, Catecholamine's and Vanillin Mendelic Acid In Urine, Serum Cortisol, and Dynamic Tests including: Test Dexamethasone 1 mg, 100 mg CRH test, 250 micrograms of ACTH, which is requested in patients as prescribed and recorded in the medical records of the patients. . Those with 2 or more abnormal dynamic or baseline tests were considered as subclinical Cushing's syndrome. Information on histological findings was also obtained according to the pathologist's records available. If the distribution of the society was normal or qualitative variable, then we used Mann-Whitney and Croscollouris tests and the x2 test was used for the nominal qualitative variable.

Results

In this study, out of a total of 100,000 existing cases, 50 patients with adrenal mass were found. The characteristics of the patients are based on age, sex, and the side of the conflict in Table 1. Males was 64% females 36%, Adrenal masses were higher in women, which was not statistically significant ($p = 0.1$). The mean age in patients with adrenal carcinoma was 55.66 years and in benign adenoma was 25.24 years. This difference was statistically significant ($p = 0.001$). Adrenal mass increased to the right (54%) more than the posterior Left (40%). 72% of the patients had an adrenal mass less than 4 cm, and all patients with adrenal carcinoma had a mass size greater than 4 cm. Frequency of masses smaller than 4 cm in benign adenomas (77/77%) whit statistically significant ($p = 0.002$)was more, respectively. The most commonly found mass in our study was non-functional masses (54%), followed by benign adenoma (18%). frequency of other masses are listed in Table 2. The most commonly reported sign were hypertension (40%) and asymptomatic patients (24%) in the second place. One patient was also found with thyroid metastasis other symptoms are listed in Table 3.

Discussion

In this study, from 100,000 cases reviewed, 50 patients admitted to the outpatient clinics of Ahwaz in 2008-2018 with adrenal mass were studied. Benign or malignant adrenal tumors often occur in adults. However, it may also occur in children [10]. A limited report has also been made of the occurrence of adrenal tumors in children [1]. In our study, adrenal masses were only in adults. And the highest mean age of 55.66 years was related to adrenal carcinoma. The mean age of patients with non-functional masses was 48.1, which was similar to other studies [8, 10, 11]. Adrenal mass is rare in children and in this study adrenal mass at the age of less than 26 years old was not associated with pseudo cyst adrenal disease. In adolescent studies, adrenal carcinoma was reported in a 13-year-old child [1]. Adrenal mass is rare in children, in this study, adrenal mass at the age of less than 26 years was not seen, which was related to the pseudo cyst adrenal. However in a study by Ciftci et al., Adenocarcinoma was reported in a 13-year-old child [1]. In our study, the frequency of adrenal mass in women was higher than that of men, so that all patients with adrenal carcinoma were women. But statistically, this difference was not significant, which is similar to those in Yazd and the United States [10, 12]. In our study the most clinical

symptoms in patients was blood pressure (40%), and asymptomatic patients who were incidentally identified (24%) were in the next position. Our results were different from other studies, so that symptoms such as abdominal mass, abdominal pain and Cushing's syndrome were reported as more frequent symptoms in other studies [10, 13-15]. In our study, non-functional masses (54%) were the most frequent adrenal masses, was similar to that of the Mantero study [16]. But in the study conducted in Yazd, functional masses were more common [10]. In our study, the mean age of adrenal carcinoma was 55.66 years, and all patients were female. In total, 32 patients (64%) had adrenal mass was female and 18 patients (36%) was male. This difference was not statistically significant ($p = 0.08$), which was similar to the results from other studies that reported a higher prevalence of adrenal mass in female [17, 18]. But in a in Yazd "study, the prevalence of adrenal mass was higher in males[12].

In the present study, the frequency of benign adenoma was higher in women (88.88%). The mean age of benign adenoma was about 40 years, indicating that patients with benign adenoma were younger than those with adrenal carcinoma. Adrenal cysts are rare tumor like lesion in adrenal. In our study, there was a patient with adrenal pusto cyst that was larger than 4 cm. Also, according to previous studies, it has been reported that 80% of these cysts are larger than 4 cm in size [19]. In our study, the frequency of the masses less than 4 cm (72%) was higher, but all patients with adrenal carcinoma had a mass greater than 4 cm. Most of the non-functional mass (85%) and benign adenoma (77.7%) was less than 4 cm in size.

On the other hand, the prevalence of benign tumors from 4 cases in 2008 to 12 cases in 2018 has been reassigned. It is also not clear that this increase is due to an increase in the incidence of this disease during these 10 years, or increased use from imaging studies for non-specific problems, which leads to accidental finding of asymptomatic adrenal masses, which are often benign [10]. This finding was similar to other studies [20, 21].

Conclusion

In this study, non-functional masses were the most common and the frequency of adrenal mass in women was more than that of men. Also, with an increase in the frequency of adrenal masses during these 10 years, early diagnosis and treatment can prevent the progression of these lesions and Reduce mortality and morbidity rate.

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Table 1: Patient characteristics (Age, Sex, and Side of conflict)

Type	woman		man		Left side		Right side		Both
	frequency	Percent (%)	frequency	Percent (%)	frequency	Percent (%)	frequency	Percent (%)	side
benign adenoma	8	88.8	1	11.2	3	33.33	6	66.67	0
Adrenal Carcinoma	3	100	0	0	2	66.66	1	33.34	0
Pheochromocytoma	2	40	3	60	3	60	2	40	0
Cushing	1	33.35	2	66.65	2	66.66	1	33.34	0
Non-functional	15	55.55	12	44.45	9	33.33	15	55.55	3(11.12)
hydatid cyst	1	100	0	0	0	0	1	100	0
Adrenal pseudocyst	1	100	0	0	1	100	0	0	0
Thyroid Metastasis	1	100	0	0	0	0	1	100	0

Table 2: frequency of masses

Type	Frequency	Frequency percentage	Mean of age(year)
Benign adenoma	9	18	40/25
Adrenal carcinoma	3	6	55/66
pheochromocytoma	5	10	42/2
Cushing	3	6	38
Non-function	27	54	48/1
Hydatid cyst	1	2	26
Adrenal pseudo cyst	1	2	33
Thyroid Metastasis	1	2	42

Table 3: Symptoms of thyroid metastasis

Symptom	Frequency	percent
Asymptomatic	12	24%
Hypertension	20	40%
amenorrhea	6	12%
hirsutism	4	8%
Loss of weight	1	2%
Cushing symptom	2	4%
Abdominal pain	2	4%
headache	2	4%
Metastasis	1	2%