Adrenal carcinoma: case report

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Abstract

Adrenocortical carcinomas are highly malignant rare tumors that can occur in adults, adolescents or children, Whil they can affect both sexes the incidence is higher among girls. Hormone-secreting tumors and the associated classic endocrine syndromes (virilizing, feminizing, Cushing's and Conn's syndromes) represent the most common presentation in this age group. Both genetic and environmental factors have been implicated in its etiology. Diagnosis is done by imaging studies including Computerized tomography scan an/ord magnetic resonance imaging of abdomen in addition to ultra-sound examination, histological confirmation is done by excisional biopsy or in exceptional conditions by fine needle aspiration. Regarding functional state of the tumor hormonal study is needed. Treatment includes; complete radical surgical resection which might be curative in case of small tumors, in patients with incomplete resection or metastatic spread treatment options include mitotane and/or chemotherapy. radiation therapy is recommended in the treatment of bone, brain and other metastases, radiation therapy is also recommended in the treatment of symptomatic local recurrences. Regarding prognosis It has been reported that patients with untreated adrenocortical carcinoma have a median survival of 3 months only. In treated adrenocortical carcinoma, overall 5-year survival ranged between 23% and 60% in different series. We present a 17 years old girl, she presented with generalized acne, virilizing features, primary amenorrhea and hemoptysis, Investigations revealed adrenocortical carcinoma. In the light of this case, the literature about adrenocortical carcinoma was reviewed.

Conclusion: Adrenal carcinoma can occur in our locality and the diagnostic keys are hormonal and imaging studies.

Keywords: Adrenal gland. Neoplasm. Endocrine.

Introduction

Adrenocortical carcinomas are highly malignant tumors that account for only 0.2% of deaths due to cancer. These are rare tumors and their incidence has been estimated at 2 per million people per year. most cases occur between. Ages of 30 and 50 [1]. **Clinical features;-** The incidence of adrenal carcinoma is higher among girls with the overall female/male ratio being 2.3:1, The presenting manifestations of adrenocortical tumor depend largely on the specific tumor's secretion of adrenocortical hormones. Hormone-secreting tumors and the associated classic endocrine syndromes (virilizing, feminizing, Cushing's and Conn's syndromes) represent the most common presentation in this age group. Although the clinical manifestations of one endocrine syndrome.may predominate, adrenocortical tumors usually secrete several hormones and thus present signs and symptoms of multiple syndromes (mixed forms) [2]. Adrenal tumors are classified as either functional or nonfunctional, approximately 80% are functional, and they are usually larger than 6 cm. In a series published by Kendrick et al cortisol-secreting tumors were the most common functional tumors (67%), followed by mixed hormonal

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secreting tumors (15%), sex hormonal excess (11%), and aldosterone secreting tumors (7%) (3) The tumour is usually detected only after it has reached considerable size (often >8 cm)(4)

Etiology:

Regarding etiology of adrenal carcinoma, molecular cytogenetic cloning studies during 5 years have described chromosomal abnormalities possibly associated with tumorigenesis [1], while genetic defects may predispose to adrenal cortical tumor formation, environmental factors have been implicated in southern Brazil because the distribution of the tumors follows a regional rather than familial pattern[1].

Diagnosis:

The suspicion of adreno-cortical carcinoma is raised by a combination of clinical, biochemical and radiological criteria and finally verified by histopathology [1] in addition to ultrasonogram, all patients suspected to have an adrenal tumor should be examined by Computerized tomography scanning or magnetic resonance imaging [2]. There is no evidence suggesting that MRI is superior to Computerized tomography[1].computed tomography Computerized tomography typically demonstrates an inhomogeneous adrenal lesion with irregular margins and variable enhancement of solid components after intravenous contrast media [5]. calcifications can also develop in tumors (carcinoma) , by Ultra sound adrenal carcinoma is usually inhomogeneous hypoechoic or echo-complex with irregular margins. It frequently infiltrates its surroundings. tumor size at presentation (mean diameter at diagnosis > 10 cm) is the most important indicator of malignancy. In addition, most adrenal carcinomas are hormone -producing. Sometimes, the tumor is usually detected only after it has reached considerable size (often >8 cm)[4]. Fine needle aspiration biopsy of an adrenaloma has a limited role, it is useful in cases of coexistent extra-adrenal carcinoma to confirm the radiological evidence of adrenal metastasis[6] Fine needle biopsy does not distinguish benign adrenal adenoma from a adrenocortical carcinoma and there is theoretical risk of seeding tumor cells, the role for biopsy when there is widespread metastasis and tissue is required. Excisional biopsy is preferred and the complication rate is >3% [7].

Treatment:

Complete radical surgical resection is the treatment of choice and may be curative, especially in small tumors. In one series survival rate reached 70% if resection was complete [8]. There is no role for laparoscopic removal of a known or likely adrenocortical carcinoma, but there is controversy on the role of laparoscopic removal of indeterminate incidentalomas that could admittedly be small ACCs [1]. In patients with incomplete resection or metastatic spread (stage II-IV) treatment options include chemotherapy and/or mitotane [8], Regarding chemotherapy, the results are variable, there is evidence that cisplatin alone or in combination with Etoposide has some activity in advanced adrenocortical carcinoma, the highest response rate so far has been observed in a phase II multicentre trial from Italy using the combination of Etoposide (100 mg/m2/day on days 5–7), Doxorubincin (20 mg/m2/day on days 1 and 8) and Cisplatin (40 mg/m2/day on days 1 and 9) every 4 weeks (3–8 cycles) given together with continuous mitotane (planned dose 4 g/day) [5].

Mitotane:

is an isomer of the insecticide p,p′- DDD and a chemical congener of the insecticide DDT. It is an adrenolytic compound with specific activity on the adrenal cortex, Its therapeutic effects depend on intra-adrenal metabolic transformation. Mitotane is either given as tablets in doses > 3 g/day or as capsules of micronized mitotane mixed with cellulose acetylphthalate, with

a lower absorption rate, but, possibly, a better gastrointestinal tolerance, Drug monitoring is important side-effects of mitotane occur frequently and are often dose-limiting. These effects are mainly gastrointestinal (diarrhoea, nausea, anorexia) or concern the central nervous system

(lethargy,somnolence, ataxia, dizziness, and confusion)[5]. Adrenostatic drugs other than mitotane may be needed to control endocrine activity (Luton et al., 1990). Metyrapone, ketoconazole, etomidate and aminoglutethimide inhibit P450-steroidogenic enzymes like 11β - hydroxylase and side-chain cleavage enzyme (Feldman, 1986). Aminoglutethimide is also an inhibitor of aromatase activity [5].

Regarding radiation therapy, it is probably as effective in adrenocortical carcinoma as in the majority of other solid tumors. As with other solid tumors, radiation therapy is recommended in the treatment of bone, brain and other metastases, radiation therapy is also recommended in the treatment of symptomatic local recurrences [1].

Prognosis :

In general, the prognosis for adrenocortical carcinoma is still grim. It has been reported that patients with untreated adrenocortical carcinoma have a median survival of 3 months only. In treated cases, overall 5-year survival ranged between 23% and 60% in different series [5].

Case history:

A 17 years old girl named H.N. brought to the private clinic by his parents on 27.6.2011 with the complain of generalized acne and hirsutism. Her childhood period was normal, hirsutism, started since age of 11 years which increased in severity during last 2 months in her face and other parts of body, 1 year ago mild acne started which increased in severity during last 6 months. The color of her face also changed to more dark, She has primary amenorrhea, 3 weeks before admission she developed cough, sputum and hemoptysis, She consulted ear nose and throat specialist for throat pain and hemoptysis without benefit. She consulted dermatologist for acne who prescribed for her steroids without benefit. She has no FH of cancers. Past medical history is unremarkable, She has no history of operations previously Regarding drug history; she has been given dexamethazone for 1 week as a treatment for acne. photos of the patient.

Physical examination:

General physical examination revealed a short, thin young girl with generalized pigmentation, excessive body hair and diffuse acne on her face, chest, abdomen and both upper and lower limbs, her pulse was 90bm, BP was 135/90 mmHg. Temperature was 37 C° with normal respiration. Systematic examination was unremarkable apart from harsh breathing sounds and bilateral chest crackles.

Investigations:

1-Hormonal, biochemical and hematological investigations;-

-24 hour-urinary free cortisole 1632 nm/L reference range; 171-536 nm/L

-17 OH-progesterone ; >20 ng/ml reference range; 0.07-1.7 ng/ml

-T3 0.99 nmol/L reference range 0.99-2.5 nmol/L

-T4 59.07 nmol/L reference range 60-120 nmol/L

-TSH 2.8 µIU/L reference range 0.25-5 µIU/L

-LH; 0.1 mU/mL reference range 0.5-6.5 mU/mL

-FSH; 0.27 mU/mL reference range 1.5-7 mU/mL

-Prolactin; 36.84 Ng/ml reference range; 5-35 Ng/ml

-Testosterone; >13 Ng/ml reference range; 0.1-0.9 Ng/ml

-Fasting plasma glucose; 90mg/100ml reference range; 60-100 mg/100ml

-Blood urea and serum creatinin were within normal ranges

-Full blood count; Normal parameters, ESR; 20 mm/hour

2- Imaging techniques**;**

- Computerized tomography scan of the abdomen and pelvis arranged and revealed;-Large size calcified left adrenal mass measuring 7.7 Cm by 6.7 Cm in relation to superior and anterior part of the left kidney displacing the stomach anteriorly. No ascites, No para aortic lymphadenopathy, Normal spleen and liver, No hepatic metastasis, Normal uterus and ovaries, No free fluid.-Chest X ray; Bilateral lungs show multiple rounded masses enumerable of

different sizes (canon ball appearance), findings which are in favor of metastasis. 3- Computerized tomography guided Fine needle aspiration revealed;- pleomorphic epithelial cells with abundant eosinophilic cytoplasm, scattered singly and in small clusters forming acini and trabeculae, occasional tumor giant cells were also noted, the picture that is consistent with adrenocortical tumor, Although it is not possible from cytology material alone to predict the biological behavior of an endocrine cell tumor, the presence of multiple pulmonary metastasis in this patient strongly favors this adrenocortical tumor as the primary origin.

Discussion

The main clinical problems of this patient were sever generalized acne, hirsutism, and primary amenorrhea, Such virilizing features are suggestive of presence of high testosterone level or testosterone like hormones, as it was clear from investigations mentioned, the presentation of this patient is late, this is usual in cases of adrenocortical carcinoma and may be due to absence of systemic inflammatory response and non specific tumor symptoms like anorexia and weight loss [5]. Imaging techniques revealed left adrenal mass, Although surgical resection is usually indicated for dealing with such conditions, but in the presence of distant metastasis as in this patient chest X ray revealed lung metastasis, which has been reported before at time of diagnosis [9]. surgical resection will not eradicate the source of malignant cells [6]. Fine needle aspiration carries a theoritical risk of seeding tumor cells to the tract, But when there is widespread metastasis and tissue is required it is indicated for management plan because the exact diagnosis was necessary [7], the pathological report was suggestive of adrenal carcinoma, On the base of presence of lung metastasis the patient had stage IV disease and sent to oncologist for chemo therapy plan.

Conclusion

Adrenal carcinoma can occur in our locality and the diagnostic keys are hormonal and imaging studies.

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