

Beta Human Chorionic Gonadotropin, Think Beyond Pregnancy, an Unusual Paraneoplastic Adenocarcinoma of the Lung

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Abstract

Patient: Male, 39-year-old.

Final Diagnoses: Adenocarcinoma of the lung, non-small cell cancer, paraneoplastic syndrome.

Clinical Procedure: Bronchoscopy.

Specialty: Pulmonology, oncology, lung cancer.

Objective: Unusual clinical course.

Keywords: Bronchogenic Carcinoma Beta HCG; Lung Neoplasm; Smoker; Germ Cell Tumor; Non- Small Cell Lung; Human Chorionic Gonadotropin; Ectopic Hormones; Paraneoplastic Syndrome

Background

Human chorionic gonadotropin is a glycoprotein hormone that is produced in high concentrations by placental trophoblast. During pregnancy the serum concentration increases rapidly peaking at 7 - 10 weeks. The exception to this rule consists of the free beta subunits which can occur in several cancers. Overexpression of beta human chorionic gonadotropin is rare in lung cancer. In a male the exclusion of a germ cell tumor is important and in women confirmation of pregnancy needs to be excluded. Paraneoplastic syndromes associated with ectopic β -hCG production have been previously described in oropharyngeal squamous cell carcinoma, urothelial carcinoma of bladder, clear cell renal cell carcinoma, leiomyosarcoma and malignant phyllodes tumor of the breast. To date, fewer than 100 cases of β -hCG secreting lung carcinomas have been reported in the English literature. We present a case of a young 39-year-old female smoker diagnosed with Adenocarcinoma of the lung producing β -hCG [1-5].

Case Report

A 39-year-old woman G5 P4 with ~15 pack year tobacco smoking history, who presented with persistent cough and weight loss that began 2 months ago. On computed tomography of the chest, the patient was found to have a right lung mass in the infra-hilar region which was about 9 cm in size associated with complete obstruction of right lower bronchus. She underwent bronchoscopy and biopsy findings were suggestive of poorly differentiated adenocarcinoma of the lung and bronchial obstruction of the right lower lobe. Patient was referred to interventional pulmonology for endobronchial tumor debulking but was cancelled as her urine pregnancy test was positive with a beta HCG value of 131.2 milliunits/ml. Transvaginal ultrasound showed no evidence of intrauterine pregnancy. The patient denied intercourse or intimate contact in the past 3 months and had undergone tubal ligation. The possibility of para neoplastic syndrome

of β -hCG secreting pulmonary adenocarcinomas was discussed with the patient and the lung biopsy tumor cells were stained for β -hCG. The tumor cells stained positive for β -hCG and PD-L1 Tumor Proportion score of 90%. The patient was started on Carboplatin and Pemetrexed. β -hCG value after 1st chemotherapy was 61 mIU/ml. Unfortunately, she did not tolerate therapy well, and the patient was eventually enrolled in hospice.

(HCG) Human chorionic gonadotropin is a dimer of alpha and beta subunits. Measurable serum β -hCG is usually consistent with a pregnancy or pregnancy related condition such as gestational trophoblastic tumors. β -hCG can be detected in conditions not associated with pregnancy. Lung cancer can also secrete β -hCG as an ectopic hormone. Ectopic Serum β -hCG is not specific for any histological subtypes but is more characteristic in adenocarcinoma. Clinical manifestations of β -hCG include amenorrhea mimicking pregnancy. This young female patient was initially believed to be pregnant due to her high HCG levels. The possibility of pregnancy had to be eliminated leading to clinical delay in obtaining a biopsy. Immunohistochemistry confirmed etiology with positive β -hCG staining from the original biopsy of the pulmonary adenocarcinoma.

Discussion

Ectopic hormone production (e.g. antidiuretic hormone, parathyroid hormone and adrenocorticotrophic hormone) manifesting as paraneoplastic syndromes is not uncommon in pulmonary small-cell carcinomas and a smaller proportion of non-small cell lung carcinomas (NSCLC), particularly squamous cell type. Ectopic β -hCG expression by non small cell lung cancer is rare. The precise mechanism of β -hCG secreted by non trophoblastic tumors is poorly understood. Some authors have proposed the concept of a trophoblastic metaplasia within the carcinomatous tissue. β -hCG is important in the role of promoting progesterone production and vacuologenesis in the uterine wall. β -hCG have been found to be involved in tumorigenesis of non-trophoblastic tumors. These anti apoptotic and angiogenic properties allowing cancerous cell growth seems to be part of the reason why some authors speculate the chemoresistance and aggressiveness of β -hCG-secreting lung cancer.

Conclusion

This is a unique and uncommon case. At the time this was written and after a search in PubMed there are only a few hundred cases reported. β -hCG secreting pulmonary lung adenocarcinoma is rare. (HCG) Human chorionic gonadotropin is a dimer of alpha and beta subunits. Measurable serum β -hCG is usually consistent with a pregnancy or pregnancy related condition such as gestational trophoblastic tumors. β -hCG can be detected in conditions not associated with pregnancy. Lung cancer can also secrete β -hCG as an ectopic hormone. Ectopic Serum β -hCG is not specific for any histological subtypes but is more characteristic in adenocarcinoma. Clinical manifestations of β -hCG include amenorrhea mimicking pregnancy. This young female patient was initially believed to be pregnant. The possibility of pregnancy had to be eliminated leading to clinical delay. Immunohistochemistry confirmed etiology with positive beta HCG staining from the original biopsy of the pulmonary adenocarcinoma. This unusual presentation needs to be identified and prompt diagnoses made in order to provide immediate therapy.

Conflicts of Interest

None declared.

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