Extreme High Levels of CA19-9 Associated with Adenocarcinoma of the Lung

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The diagnosis of pancreatic adenocarcinoma can be difficult. In addition to risks factors, clinical presentation and radiological tests, an elevated level of the tumor marker CA19-9 may help in the diagnosis of pancreatic cancer. Although high levels of CA19-9 may also be found in a variety of other malignant and benign conditions, extreme levels of CA19-9 are not seen in these conditions. In the presented case an extremely high level of CA19-9 was documented in a patient with non-small cell lung cancer without lesion in the pancreas.

PATIENT DESCRIPTION

A 51 year old man without a medical history except for smoking presented to his primary physician in June 2005 with a complaint of low back pain of a few weeks duration. The physical examination and the X-ray were normal. Bone scan showed areas of increased uptake at the lumbar spine and in the left ribs; the patient was referred for further evaluation.

The serum level of CEA (carcinoembryonic antigen) was 2921 ng/ml, NSE (neuron-specific enolase) 10.37 ng/ml and CA19-9 42141 U/ml. Computed tomography revealed a 6 cm mass in the left lower lobe of the lung, enlarged lymph nodes in the hillum, and two hypodense lesions in the liver. The other abdominal organs, including the pancreas, were normal. CT-guided lung biopsy confirmed the diagnosis of poorly differentiated adenocarcinoma of the lung which stained positive for CA19-9 and CK7, and negative for TTF-1 and CK20. Palliative radiotherapy was delivered up to a total of 30 Gy in 10 fractions to the lumbar spine due to bone metastasis. After the completion of radiotherapy, chemotherapy using carboplatin, gemcitabine and cetuximab was begun. Despite aggressive treatment, no improvement was observed. Dyspnea appeared and his pain worsened, and in September the patient died.

COMMENT

CA 19-9 is a sialyl derivative of lacto-N-fucopentaose II, hapten of human Lewis, a blood group determinant. This carbohydrate antigen is expressed in bronchiolar epithelial cells and found in bronchoalveolar lavage in patients with pulmonary fibrosis. Purified CA19-9 stimulated neutrophil chemotaxis to C5a, IL-8 and fMLF. Normally, CA19-9 may be found in healthy individuals at concentration < 40 U/ml and it increases in benign hepatobiliary disease, with the highest levels in excretory ductal pancreatic adenocarcinoma, biliary, hepatocellular and cholangiocarcinoma cancer.

Correlation between CA19-9 and the size of the pancreatic adenocarcinoma was reported in previous studies [1]. CA19-9 is associated as a tumor marker with metastatic disease in pancreatic cancer, colorectal cancer, urothelial cancer and melanoma. Neoplasm transformation is induced by high expression of CA19-9. Extravasations of tumor cells from the bloodstream and formation of metastatic disease were associated with CA19-9. The mechanism is probably due to its interaction with E-selectin expressed on endothelial cells.

The radiological findings in the current case, including a 6 cm mass in the left lower lobe of the lung, enlarged lymph nodes in the hillum without a pancreatic lesion in the presence of extremely high levels of CA19-9, support the diagnosis of a primary lung tumor. Furthermore, the presence of bone metastasis agrees with the diagnosis of lung cancer rather than pancreatic cancer. The absence of TTF-1 staining in the lung specimen and the positive staining of CA19-9 is not infrequent in lung adenocarcinoma. Malignant epithelial tumors of the lung stained positively for CA19-9 in 59% [2] and negatively for TTF-1 in 26.8% [3]. In addition, staining that is positive for CK7 and negative for CK20 strongly supports the diagnosis of lung cancer [4].

The presence of elevated CA19-9 levels in patients with lung cancer has been described in Japan. Most of these patients were diagnosed with adenocarcinoma [5]. In addition, cell lines from poorly differentiated adenocarcinoma of the lung may produce this tumor marker.

In conclusion, CA19-9 may be elevated not only in the case of pancreatic cancer but also in patients with non-small cell lung cancer. Due to the similar demographic and environmental risk factors for both conditions, it is important to interpret the CA19-9 results in light of the clinical presentation as well as chest and abdomen imaging.

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