Clinical Value of Serum TAG-72 as a Tumor Marker for Pancreatic Carcinoma

Comparison with CA 19-9

Claudio Pasquali,* Cosimo Sperti, Alfonso Alfano D’Andrea, Vincenzo Costantino, Chiara Filipponi, and Sergio Pedrazzoli

Institute of Semeiotica Chirurgica, University of Padua, Padua, Italy

Summary

We evaluated the sensitivity and specificity of the carbohydrate antigen TAG-72 as a tumor marker for pancreatic cancer compared with the serum values of CA 19-9. Forty healthy controls, 58 patients with pancreatic carcinoma, and 45 patients with chronic pancreatitis were studied. In patients with pancreatic cancer, 47/58 (81%) and 26/58 (45%) had raised serum levels of CA 19-9 and TAG-72, respectively; the sensitivity of the tests was not influenced by jaundice. In the chronic pancreatitis patients, both CA 19-9 and TAG-72 were elevated in 2/45 patients (4.4%). Both tests showed a specificity of 95%. Consequently, the sensitivity of TAG-72 was too low compared with CA 19-9. Moreover, serum TAG-72 could not detect small pancreatic cancers. High levels of both tumor markers were found in advanced stages of cancer. No advantage was found using both CA 19-9 and TAG-72 for improving the detection of pancreatic cancer. TAG-72 serum levels >10 U/mL are closely related to unresectability of the tumor. Only 4/17 (23%) of patients with resectable tumors had high TAG-72 levels. Serum TAG-72 expression seems to be more frequent in poorly-differentiated tumors than in well-differentiated cancers (56 vs 30% positivity rate).

Key Words: Tumor markers; carbohydrate antigen; TAG-72; CA 19-9; pancreatic carcinoma; B 72.3.

Introduction

Early diagnosis of pancreatic cancer and differential diagnosis between malignant and benign pancreatic diseases are of crucial importance in clinical work for the appropriate management of patients. However, early diagnosis of pancreatic cancer is infrequent, since most cases are diagnosed in advanced stages and only 20–30% of patients may undergo resective surgery. Only one-third of resectable tumors are confined to the pancreatic gland without invasion of the surrounding tissues and, therefore, are potentially curable with the surgical treatment alone. The 5-yr survival for pancreatic carcinoma remains well below 5% (1,2).

Recently, there was growing interest in evaluating serum markers for the diagnosis of pancreatic cancer. Serum levels of CA 19-9 (3–11) and CA 50 (12–19)
have shown good sensitivity and specificity. Therefore these tumor markers have become reference values when evaluating new markers for pancreatic cancer (20,21). TAG-72 is a human tumor-associated antigen defined by the murine monoclonal antibody (MAb) B 72.3, prepared from a membrane enriched fraction from a human metastatic breast carcinoma. It is a high-mol-wt (1 x 10^6 dalton) glycoprotein with the characteristics of a mucin (22). The (MAb) B 72.3 appears to react with the O-linked disaccharide, N-acetyleneuraminic acid-alpha 2 → 6- N-acetylgalactosamina alpha1 → O-Ser/Thr (sialosyl-TN structure) (23). TAG-72 has been shown to be different from CEA, CA 19-9, OC-125, and CA 15-3 (24). Several reports on serum TAG-72 or CA 72.4 in colonic (24), ovarian (25), and gastric cancer (26) have been published. However, the clinical value of TAG-72 in pancreatic cancer has not yet been clearly established, and only occasional findings have been reported (27-31).

This study evaluates the reliability of the serum TAG-72 level as a tumor marker for pancreatic cancer and its usefulness in differential diagnosis with chronic pancreatitis. We compared the TAG-72 values with that of CA 19-9, the sensitivity of which has been well established (7,11,20,21).

**Materials and Methods**

A total of 143 patients were divided into three groups. The first group consisted of 40 healthy control subjects (25 males, 15 females) with an average age of 46 yr (range, between 26-65). The second group consisted of 58 patients (37 males, 21 females) with histologically proven pancreatic carcinoma. The age of the patients averaged 59 yr (range, 27-88). Histologically, 52 tumors were ductal adenocarcinomas, 5 acinar cell carcinomas, and 1 cystadenocarcinoma. Of ductal adenocarcinomas, 20 were well-, 16 moderately-, and 16 poorly-differentiated. According to the TNM staging system (32), 5 patients were classified as stage I, 13 as stage II, 17 as stage III, and 23 as stage IV. In patients with pancreatic cancer, 40/58 were affected by advanced disease (stage III or IV) 23 having liver metastases (39.6%). Thirty-three cancer patients (32/52 ductal adenocarcinomas and 1/5 acinar cell carcinomas) had obstructive jaundice and 25 had normal serum biliru-