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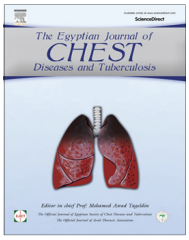

ORIGINAL ARTICLE

Diagnostic value of cyfra 21-1 and carcinoembryonic antigen in differentiation between benign and malignant pleural effusion

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KEYWORDS

Cyfra 21-1;
CEA;
Malignant;
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Effusion

Abstract *Background:* Tumor markers were used in malignant pleural effusion with negative cytology.

Aim of the work: The aim was to assess the value of serum and pleural levels of cyfra 21-1 (fragment of cytokeratin 19) and carcinoembryonic antigen (CEA) in the diagnosis of malignant pleural effusion.

Patients and methods: This study was conducted on 48 patients divided into group I (benign effusion) and group II (malignant effusion). Chest X-ray P.A view, pleural fluid analysis and measurement of serum and pleural levels of CEA and cyfra 21-1 were done.

Results: Serum and pleural levels of cyfra 21-1 and CEA were significantly increased in the malignant group and compared to other groups. Sensitivities of cyfra 21-1 and CEA in serum were 90.4 and 90.5 and in pleural fluid were 94.7 and 92.6, the specificities of cyfra 21-1 and CEA in serum were 86.9 and 83.5 and in pleural fluid were 89.3 and 85.8 but sensitivity of both cyfra 21-1 and CEA in serum and pleural fluid was 100 and specificities in serum and pleural fluid were 92.86 and 96.43.

Conclusion: Measurement of cyfra 21-1 and CEA in serum and pleural fluid is helpful in differentiation between benign and malignant pleural effusions.

Introduction

Malignant pleural effusion is diagnosed by positive cytology for malignant cells but pleural fluid cytology is negative in 50% of cases so, determination of tumor markers either in

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serum or pleural fluid has been used in the diagnosis of pleural malignancy [1] (see Fig. 1).

Cyfra 21-1 is a fragment of cytokeratin (CK) 19 which is the principal structural element of the cytoskeleton and expressed in the pseudostratified epithelium lining the bronchial tree [2], and been reported to be overexpressed in many lung cancer tissue specimens [3] due to accelerated CK19 degradation as a result of increased protease activity of caspase 3, a regulator of the apoptosis cascade , leading to release of fragments into the blood resulting in an increase of the cyfra 21-1 level in serum and other body fluids [4].

CEA is an oncofetal protein, elevates in the serum of patients with colorectal, gastrointestinal, lung and breast carcinomas and also differentiates between benign and malignant pleural effusions [5]. It is synthesized by malignant cells as an adhesion molecule that is implicated in cell aggregation [6].

Aim of the work

To assess the diagnostic value of serum and pleural levels of cyfra 21-1 and CEA in differentiation between benign and malignant pleural effusion.

Patients and methods

This study was done in the Chest department – Tanta university hospital and Tanta chest hospital during the period from July 2013 to December 2013 and carried out on 48 patients with pleural effusions divided into: *Group I:* included 28 patients with benign pleural effusion divided into 3 subgroups, (A): included eight patients (four males and four females) with parapneumonic pleural effusion, their mean age was 55.87 ± 11.420 years and characterized by the presence of acute fever with purulent sputum, pulmonary infiltrate, leukocytosis and neutrophilia with predominance of neutrophils in cellular analysis of pleural fluid [7], (B): included ten patients (seven males and three Females) with tuberculous pleural effusion, their mean age was 35.70 ± 8.97 years and diagnosed by high positive tuberculin test, high ESR, lymphocytic pleural effusion, positive acid fast bacilli in sputum or pleural fluid and pleural fluid adenosine deaminase more than 40 u/l [8] and (C): included ten patients (seven males and three females) with transudative pleural effusion, their mean age was 56.60 ± 5.621 years and diagnosed according to Light's criteria by one of the following: – ratio of pleural fluid lactate dehydrogenase (LDH) to that in serum was less than 0.6, ratio of pleural fluid total protein to that in plasma was less than 0.5 and the LDH level in the pleural fluid needed to be less than two thirds of the serum level [7]. All of them were cardiac patients with congestive heart failure confirmed by echocardiography. *Group II:* included twenty patients (fifteen males and five females) with malignant pleural effusion, their mean age was 55.35 ± 8.13 years and diagnosed if pleural fluid cytology for malignant cells was positive [7].

Exclusion criteria:

- patients under chemo-therapy or radio-therapy,
- immuno-compromised patients,
- patients with bleeding tendency.

The following was done:

- full history taking and Complete clinical examination, chest X-ray P.A view and CT if needed,
- Z. N stain of sputum and Tuberculin test (if TB was suspected),
- complete blood picture, serum protein, LDH and ESR,
- pleural fluid aspiration and analysis for [9]:

– Physical examination: color, odor, specific gravity and aspect.
– Chemical examination including: protein level, LDH level, total and differential cell count and adenosine deaminase levels (when tuberculous effusion is suspected).
– Bacteriological examination.
– Cytological examination for malignant cells.

- Estimation of serum and pleural levels of carcinoembryonic antigen used (CanAg CEA EIA-Ref: 401-10 Fujirebio Diagnosting Inc., Elof Lindalvs gata 13, SE 414 58

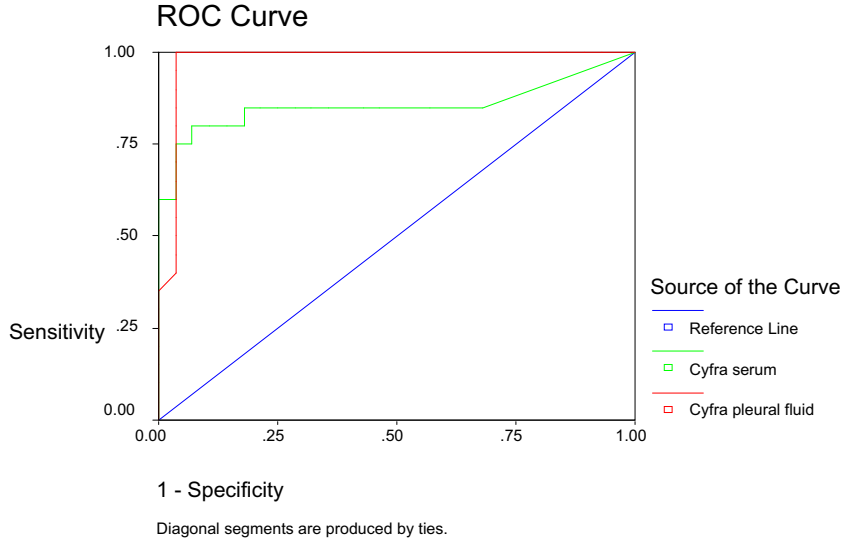

Figure 1 ROC curve of cyfra 21-1 sensitivity and specificity in serum and pleural fluid.