



The Egyptian Society of Chest Diseases and Tuberculosis
Egyptian Journal of Chest Diseases and Tuberculosis

www.elsevier.com/locate/ejcdt
www.sciencedirect.com



ORIGINAL ARTICLE

Evaluation of lung cancer by estimating ferritin in exhaled breath condensate



Samiha S. Ashmawi ^a, Haytham S. Diab ^{a,*}, Elsayed A. Fahmy ^b

^a Chest Department, Faculty of Medicine, Ain Shams University, Egypt

^b El Mansoura Chest Hospital, Egypt

Received 15 June 2014; accepted 3 August 2014

Available online 7 April 2015

KEYWORDS

Lung cancer;
NSCLC;
Squamous cell carcinoma;
Adenocarcinoma;
Exhaled breath condensate;
Ferritin level

Abstract *Introduction:* Early detection of lung cancer is vital to improve lung cancer survival rates and also could change the disease outcome. There is increasing interest in EBC analysis, because the method of collection is simple, non invasive, repeatable and does not necessarily require patient cooperation. This study aimed at estimating ferritin in exhaled breath condensate (EBC) in an attempt to evaluate its role as a non invasive marker for early detection of lung cancer.

Patients and methods: This study included 40 patients diagnosed as lung cancer as well as 20 patients with chronic obstructive pulmonary disease (COPD) and 20 control subjects. Ferritin level was estimated in EBC of all included subjects.

Results: The ferritin level in EBC was the highest in the lung cancer group of patients (> 60 ng/ml) in comparison to COPD patients (35–40 ng/ml). The ferritin level was the lowest in the control group. The statistical comparison of the ferritin level among the 3 groups was highly significant ($p < 0.001$).

Conclusion: The estimated ferritin level in EBC can serve as a non invasive and inexpensive marker for screening of lung cancer.

© 2014 Production and hosting by Elsevier B.V. on behalf of The Egyptian Society of Chest Diseases and Tuberculosis.

Introduction

Lung cancer is the leading cause of cancer related mortality in the world. The American Cancer Society estimated that in 2013 the disease accounts for almost 159,500 deaths in the United States or approximately 27% of all cancer deaths in the country. Lung cancer accounts for about 14% and 12%

of all new cancer diagnoses in males and females, respectively, and nearly 70% of patients with lung cancer present with locally advanced or metastatic disease at initial diagnosis [1].

Lung cancer is a highly prevalent malignancy that is associated with substantial morbidity and mortality. Histologically, it is divided into non-small cell lung cancer (NSCLC), the more common form, and small cell carcinoma. Approximately 85% of lung tumors are NSCLC, which comprises three major histological subtypes: adenocarcinoma, squamous cell carcinoma and large-cell carcinoma [2].

Initiation and progression of lung carcinoma are the result of the interaction between genetic and environmental factors.

* Corresponding author. Tel.: +20 011 111 111 37.

E-mail address: Haytham_samy@yahoo.com (H.S. Diab).

Peer review under responsibility of The Egyptian Society of Chest Diseases and Tuberculosis.

<http://dx.doi.org/10.1016/j.ejcdt.2014.08.002>

0422-7638 © 2014 Production and hosting by Elsevier B.V. on behalf of The Egyptian Society of Chest Diseases and Tuberculosis.

Table 1 Demographic data and its comparison among the 3 studied groups.

	NSLC group no.: 40	COPD group no.: 20	Control group no.: 20	χ^2	<i>P</i>
Age groups					
< 50	4 (10%)	3 (15%)	20 (100%)	52	< 0.001
> 50	36 (90%)	17 (85%)	0		
Sex					
Female	5 (12.5%)	0	13 (65%)	28	< 0.001
Male	35 (87.5%)	20 (100%)	7 (35%)		
Smoker	35 (87.5%)	20 (100%)	2 (10%)	49	< 0.001
Non smoker	5 (12.5%)	0	18 (90%)		

Epidemiological studies indicate that cigarette smoking has a strong association, since approximately 80–90% of lung cancers are attributable to cigarette smoking [3].

Early detection of lung carcinoma could change the disease outcome; the survival rate can increase dramatically. In the effort to improve early detection, many imaging and cytology based strategies have been employed [4].

Recent attention has focused on EBC as a non invasive method for studying the composition of airway lining fluid; it contains aerosol particles in which several non volatile compounds have been identified. EBC analysis of inflammatory biomarkers; (that might reflect different aspects of lung inflammation or oxidative stress, which is an important component of inflammation) is a non invasive method which has the potential to be useful for monitoring airway inflammation in patients with respiratory diseases [5].

An interesting inflammatory marker studied recently in lung cancer is ferritin. Ferritin an iron-storing protein, was initially measured in the serum of patients affected by lung cancer and found to have increased. Elevated levels of ferritin in the serum of patients with non small cell lung cancer (NSCLC) were attributed to an inflammation rather than to body iron overload. Ferritin was also measured in samples from airways such as bronchoalveolar lavage (BAL) and bronchial secretion. The source of ferritin in airways is postulated as stemming from the transudation of serum iron into airways [6].

This study aimed at estimating ferritin level in exhaled breath condensate (EBC) in an attempt to evaluate its role as a non invasive marker for early detection of lung cancer.

Patients and methods

The present study was conducted at the Chest Department of Ain Shams University Hospitals in the period between June 2013 and January 2014. This study included a total of 80 subjects subdivided into 3 groups; Group (A) consists of forty patients diagnosed as NSCLC, Group (B) consists of twenty patients with COPD diagnosed according to the recent guidelines [7], and Group (C) consists of twenty healthy subjects recruited from the Ain Shams University hospitals and served as controls.

All the included subjects underwent detailed medical history taking, thorough clinical examination, routine laboratory investigations, plain chest X-ray postero-anterior view, and computed tomography (CT) scan of the chest.

Exhaled breath condensate collection and processing

Samples of EBC were collected as a liquid during oral tidal breathing in the seated position for 10 min using the EcoScreen (Jaeger, Hoechberg, Germany). Subjects did not wear nose clips and reported that they had ingested no liquids or solids in the previous 2 h. Sample collection was performed according to the American Thoracic Society/European Respiratory Society Task Force (ATS/ERS Task Force) guidelines [8].

Statistical analysis

Statistical analyses were performed utilizing statistical software (SPSS for Windows, version 20.0; SPSS Inc, Chicago, IL). Descriptive statistics was presented as either mean \pm standard deviation (SD) or number and percentage. Differences in measures between groups were assessed using the independent-sample *t* test for parametric data, and Mann–Whitney–Wilcoxon *U* test for non-parametric data. Statistical correlation was done using Pearson's correlation coefficient test. Receiver operator characteristic curve (ROC curve) was used to find out the best cut off value, and validity of certain variable. Statistical significance was set at $p < 0.05$.

Results

Eighty subjects participated in this study, sixty of them were admitted at the Chest Department of Ain Shams University Hospitals and the remaining twenty healthy subjects served as controls and were recruited from the pulmonary function unit of the Chest Department of Ain Shams University Hospitals. The demographic data as well as its comparison among the 3 studied groups is shown in Table 1. There was a highly significant statistical difference as regards age, sex, and smoking status.

Table 2 Distribution of histopathology in the NSCLC group.

Variables	No	%
Squamous cell carcinoma	22	55
Adenocarcinoma	18	45

Download English Version:

<https://daneshyari.com/en/article/3399995>

Download Persian Version:

<https://daneshyari.com/article/3399995>

[Daneshyari.com](https://daneshyari.com)