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LACTATE DEHYDROGENASE LEVEL IN BRONCHIAL ALVEOLAR LAVAGE FLUID OF PATIENTS WITH BACTERIAL PNEUMONIA AND TUBERCULOSIS

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ABSTRACT : The cytoplasmic enzyme lactate dehydrogenase (LDH), can be found extracellularly in BALF in the presence of lung tissue damage. This study aimed to investigate the level of LDH in the BALF of patient with bacterial pneumonia. A total of 364 patients aged 15-55 years suffering from pneumonia, who underwent bronchoscopy with bronchoalveolar lavage in the International Private Hospital, Baghdad during the period from January 2014 until June 2017 were enrolled in this study. The majority of patients (69.2%) were aged 36 to 55 years. *Streptococcus pneumonia* accounted for 30.4% of pneumonia cases included in this study, while *Klebsiella pnemoniae, Mycobacterium tuberculosis* and *Haemophilus influenzae* accounted for 18.6%, 23% and 28% of cases, respectively. Out of the 364 patients included in this study, 228 (62.6%) had increased levels of LDH in their BALF. Interestingly, patients who were diagnosed with either *Streptococcus pnemoniae* or *Mycobacterium tuberculosis* showed a highly significant increase in LDH levels when compared to patients with normal LDH levels.

Key words : Lactate dehydrogenase, BALF, bacterial pneumonia, tuberculosis.

INTRODUCTION

Lactate dehydrogenase (LDH) is an enzyme responsible for transferring hydrogen and catalysing the oxidation of L-lactate to pyruvate with nicotinamide-adenine dinucleotide (NAD)+, as a hydrogen acceptor. Activity of LDH has been described in liver, lungs, brain, kidney, skeletal muscles, lymph nodes, spleen and myocardium, erythrocytes, platelets and leucocytes (Drent *et al*, 1996). It has been reported that pulmonary injury results in elevated tissue levels of LDH which remains high for 3 weeks. The presence of LDH in many organs makes it difficult to pin down the actual cause for any abnormal serum levels of LDH. On the other hand, measurement of total LDH levels in bronchoalveolar lavage fluid (BALF) seems an attractive approach to assess the degree of pulmonary/lung cell injury (Ulloa-Gutierrez, 2008a). Previous studies have described LDH as a useful marker for analysis of patients with complicated pneumonia. This enzyme is a marker of cellular damage and can subsequently be released from cells undergoing primary or secondary necrosis (Rydell-Tormanen *et al*, 2006; Liu *et al*, 2018).

MATERIALS AND METHODS

Bronchoalveolar lavage fluid was collected from 364 patients aged 15-55 years old suffering from bacterial pneumonia whom underwent bronchoscopy during the period from January 2014 until June 2017. All BALF samples were collected from the Internaltional private hospital in Baghdad. BALF samples were sent for cytological examination, bacteriological analyses to diagnose the causative agent and LDH measurement. The causative agent of pneumonia was detected by Gram staining, cultures, biochemical tests. Bacteriological analyses included gram stain, acid fast stain, culture on blood, chocolate and macConkey agars. After isolation of bacteria from BALF, further investigations were carried out to diagnose the causative agent of pneumonia.Due to the presence of LDH in many organs, LDH serum levels were not investigated. A colorimetric based assay (LDH LR liquid reagent-Gesan, Italy) was used for the measurement of LDH in BALF. LDH levels less than 480 U/L were considered normal, while LDH levels of 480 U/L or more were considered as an increase in this enzyme (Kim *et al*, 2014).

RESULTS

Distribution of patients according to age revealed that the majority (69.2%) of patients were in the age group 36-55. On the other hand, only 30.8% of patients were aged 15 to 35 years as shown in Fig. 1. These results show that the percentage of patients increase with increased age.

The results of bacterial analyses revealed that 30.4%,