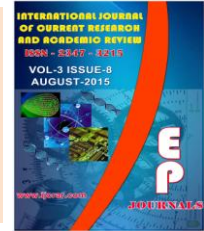




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Laboratory finding of patients with respiratory infections in infectious disease wards of Tabriz, Iran

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KEYWORDS

Respiratory infections,
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A B S T R A C T

The main aim of this study to evaluation of laboratory findings in hospitalized patients with respiratory infections in infectious disease wards of Tabriz. In a descriptive-analytical study that performed in Department of infectious diseases of Tabriz on patients with respiratory disease, laboratory findings in hospitalized patients with respiratory infections in infectious disease wards of Tabriz in 2012-2013 evaluated. In this study, 50 admitted patients with respiratory infections and 50 healthy persons evaluated. Mean age of patients in case group was 61.66 ± 18.23 and in control group was 58.80 ± 12.89 year ($P=0.368$). 34 of patients in case group and 30 persons of control group were male ($P=0.405$). 36 of patients had acute pneumonia, 7 of them had Tuberculosis (TB), 5 of them had exacerbation of Chronic Obstructive Pulmonary Disease (COPD) and 2 of them had acute tracheobronchitis. 16 of patients had Impaired consciousness. Significant difference was not found between age, height, Body Mass Index (BMI) and other demographic findings of patients. Significant difference was not found between Laboratory finding of patients.

Introduction

Tuberculosis is considered an infectious in the world and in Iran and the World Health Organization has introduced this disease as a general health emergency. Several factors are involved in the outbreak and development of tuberculosis in humans (1). In pathologic terms, pneumonia is defined as the infection of the alveoli, distal airways,

and the interstitial lung tissue. It is characterized by an increase in the weight of lungs, substitution of the spongy structure of lungs with congestion, and filling of the alveoli with blood cells and fibrin (2).

In clinical definitions, pneumonia is described as a collection of signs and

symptoms such as the following: fever, shiver, coughing, pleuritic chest pain, phlegm excretion, hyperthermia or hypothermia, increased respiratory rate, dullness per minute, bronchial lung sounds, egophony, crackles, whizzes, pleural friction rub sounds. This condition is accompanied by opacities in Chest X-Ray (CXR) images. In addition, Community-Acquired Pneumonia (CAP) is a form of pneumonia that mostly develops in non-hospitalized patients (3).

CAP is the most common form of pulmonary infections that annually infects about 1% of the population (6 million Americans). About one fifth of the victims need hospitalization and further medical care.

In general, pneumonia infects 8 to 15 people in every 1000 people each year and the largest numbers of patients with pneumonia are at the ending portions of the children and elderly age groups. The rate of infection is higher in cold seasons and the prevalence of this disease among men is higher than women (4). Pneumonia is the result of invasion of several factors such as viruses, bacteria, mycoplasmas, rickettsia, chlamydia, fungi, and parasites. Therefore, pneumonia can be caused by several causal factors the most common of which are the bacteria (5).

According to research results, at least in 82% of CAP cases there is one background factor. Cardiac conditions, especially congestive heart failure, are among the most common background factors for CAP. That is to say, 14% of cases suffer from Congestive Heart Failure (CHF) while 5.19% of the patients suffer from other background diseases. Other background factors include gag reflux disorder, reduced mucociliary function, diminished performance of the

immune system, reduced pyrogenic response, and Central Nervous System (CNS) conditions (6).

Aspiration is probably the major cause of infections with anaerobic microbes. Different statistics and figures have been reported from all over the globe on the status of pneumonia variables among the elderly and adults (7).

The aim of this research was to examine experimental findings on patients with pneumonia.

Materials and Methods

In a descriptive analytical study which was carried out in the infectious diseases department of Tabriz University on patients with pulmonary infections, the laboratory findings of these patients collected and evaluated.

In this study, all of the patients who were definitively diagnosed with pulmonary infections (whether acute or chronic) and were admitted in the infectious diseases centers of Sina and Imam Reza hospitals were selected for the study using the convenience sampling method and were included after meeting the inclusion criteria.

Ethical Considerations

In this study no additional or immoral intervention took place for patients. All of the patients' information will remain confidential and each of the methods used in this research such as—graphies, experiments, and treatments were conducted based on academic procedures.

Statistical Analysis

Research results were subjected to statistical analysis and were expressed as

mean \pm standard deviation as well as frequency (%). SPSS 16 was used for the purpose of statistical analysis. In the entire study for $p < 0.05$ the results were considered to be statistically significant.

Result and Discussion

In this study, 50 patients that were hospitalized with pulmonary infections along with 50 healthy individuals were examined. The following results were obtained:

The mean age of patients in the experimental group and control group was 61.66 ± 18.23 and 58.80 ± 12.89 years, respectively ($P = 0.368$).

In this study, 36 suffered from acute pneumonia, 7 suffered from TB, 5 were diagnosed with intensified Chronic Obstructive Pulmonary Disease (COPD) and 2 were diagnosed with acute tracheobronchitis. Moreover, 34 patients were conscious while 16 had consciousness disorders. Demographic parameters and vital signs of the control and experimental groups' members are shown in Table (1). Table (2) shows the Laboratory parameters for patients under study. CAP is one of the major problems which, despite the development of many types of antibiotics, include high rates of clinical morbidity and mortality, so that it is the sixth leading cause of death in the United States. Late diagnosis and inappropriate treatment can increase the mortality rate (8). Acute phase reactants secreted as the physiological response in inflammatory infections are increased in infections, malignancies and physical traumas.

C-Reactive Protein (CRP), Fibrinogen, haptoglobin and Erythrocyte Sedimentation Rate (ESR) are some of the most important of acute phase reactants (9-10).

It has been shown that increased ESR level is useful for monitoring inflammatory diseases, increased CRP level is a sensitive marker for pneumonia. CRP is also useful in determining the severity of inflammatory diseases and the efficacy of treatment (9-10).

Between these biochemical markers, CRP and PCT (Precalcitonin) is more important and more studies has discussed about them, positive results of these tests, especially PCT even in low levels, can be an acceptable guide for antibiotic administration.

These markers are valuable in checking the treatment responses and incidence of complications especially in AECOPD (Acute Exacerbation of Chronic Obstructive Pulmonary Disease) while they are of great importance in initiation of antibiotic administration.

In the study of Stolz and colleagues, the sensitivity and specificity of signs and symptoms of lower airway infections was low for antibiotic therapy decision making while the CXR with signs of infiltration with a CRP levels higher than 50 mg/lit and PCT higher than 0.1 ng/ml was useful for starting the antibiotic therapy (5).

Despite the presence of imaging techniques and guidelines, and culturing the samples of patients' fluids, due to some impediments and also time consuming procedure of the methods of direct vision and culture, several biochemical markers have recently been proposed for the detection of infection. Some of these tests are specific and some are non-specific. Among the available biochemical markers, CRP, Procalcitonin, and recently, fibrinogen are crucial and make up a great volume of studies.

Table.1 Demographics findings of patients

	Sex		P
	Male	Female	
Age(year)	61.31 ± 16.61	58.31 ± 14.20	0.363
Height(cm)	169.50 ± 7.16	160.81 ± 7.30	<0.001
Weight(kg)	70.18 ± 11.76	71.31 ± 17.56	0.788
BMI	24.39 ± 3.60	27.26 ± 0.88	0.024
SBP(mmHg)	121.44 ± 23.55	108.33 ± 15.55	0.056
DBP(mmHg)	74.38 ± 9.93	70.00 ± 8.45	0.148
PR	90.69 ± 18.19	91.33 ± 12.89	0.902
RR	26.38 ± 7.47	26.27 ± 6.24	0.961
BT	37.57 ± 0.87	37.55 ± 0.84	0.944

Table.2 Laboratory findings of patients

	Sex		P
	Male	Female	
WBC	15810.30±17719.31	11621.88±6843.66	0.368
Hb	12.93±2.63	11.20±1.86	0.023
MCV	84.61±8.33	83.64±6.53	0.704
PLT	256.85±147.95	260.81±139.70	0.929
AST	37.14±24.75	30.21±20.02	0.386
ALT	27.87±26.03	24.50±12.18	0.653
ALP	229.96±128.30	242.38±137.12	0.787
LDH	581.60±169.98	402.13±123.15	0.016
CPK	367.73±857.59	100.67±75.14	0.606
Ca	8.35±0.90	8.65±1.19	0.518
Alb	3.25±0.45	3.18±1.35	0.889
Protein	6.10±1.08	6.70	0.628
ESR	49.05±24.55	56.46±41.65	0.524
BUN	27.84±27.95	20.54±10.47	0.351
Cr	1.18±0.28	1.09±0.46	0.498
Na	139.52±3.51	140.00±2.99	0.637
K	4.28±0.41	4.29±0.56	0.951
Ph	7.39±0.07	7.40±0.05	0.527
Pco2	37.81±6.53	38.16±5.40	0.860
Hco3	22.44±2.59	23.72±3.47	0.181

Several biomarkers increase in bacterial infections. Some of these biomarkers are ESR, CRP and Procalcitonin. Procalcitonin is the early marker of infection in CAP, and increased level of 0.25-0.5mg/ml is the indication for commencing antibiotic therapy. In addition, reduction of level of

fibrinogen is useful in determining the duration of antibiotic therapy, and also helpful in predicting the mortality rate (12). Lacoma et al suggested that the CRP level was significantly higher in patients with pneumonia (13).

In a study by Faran et al, they suggested that the use of inflammatory biomarkers is of particular importance in the diagnosis of pneumonia, and in this study, it is proposed that CD14 and fibrinogen are not a reliable marker for the diagnosis of CAP, and the level of fibrinogen in patients with pneumonia was less than the control group (14).

CRP and ESR in patients with pneumonia increases compared to those in healthy people, and also, there was no significant relationship between the levels of CRF and ESR with different etiologies of CAP (15).

Conclusions

In this study, 50 admitted patients with respiratory infections and 50 healthy persons evaluated. Mean age of patients in case group was 61.66 ± 18.23 and in control group was 58.80 ± 12.89 year ($P=0.368$). 34 of patients in case group and 30 persons of control group were male ($P=0.405$). 36 of patients had acute pneumonia, 7 of them had TB, 5 of them had exacerbation of COPD and 2 of them had acute tracheobronchitis. 16 of patients had Impaired consciousness. Significant difference was not found between age, height, BMI and other demogerfic findings of patients. Significant difference was not found between Labortory finding of patients.

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