

# A review of sinusitis frequency, serum transaminases, and CRP in the patients with pneumonia

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**Objective** Acute or chronic sinusitis is a frequent feature of the patients with pneumonia.

**Methods** 50 consecutive patients with pneumonia were reviewed retrospectively from September 1994 to March 1996.

**Results** Cough was the most common symptom (94 %), 19 of the 50 patients had Waters roentgenograms. Sixteen of them had sinusitis signs and symptoms in their roentgenograms and physical examinations. The

sinusitis frequency was 84 per cent (16/19) in the patients with pneumonia who had paranasal sinus roentgenograms.

**Conclusion** These findings suggest that sinusitis may be an important causative factor for pneumonia, therefore treatment for sinusitis will be necessary even after treatment of the pneumonia has been completed.

**Key words** Pneumonia, sinusitis, serum transaminase,

## Introduction

Diagnosis of pneumonia depends on an understanding of the incidence, risk factors, and natural history of lung infection, the knowledge of the clinical signs and symptoms of pneumonia, and finally the application of microbiologic, biochemical laboratory techniques. There are three main ways to develop pneumonia by microorganisms: a) The aspiration of oropharyngeal secretions b) The inhalation of pathogens c) Bloodstream (1).

## Material and Method

This study included 50 patients who diagnosed as pneumonia 18-month period. There were 11 women and 39 men: the mean age was 38.26 years (from 19 to 75 years). We researched clinical symptoms, x-ray findings, abnormal laboratory values, causative microorganisms, and especially sinusitis frequency of the patients with pneumonia.

We reviewed the 50 patients diagnosed as pneumonia between September 1994 and March 1996 at the Chest Diseases Department of Medical Faculty of Yüzüncü Yıl University. Thirty-five of these patients were hospitalized, and 15 were outpatient. Thirty-nine (78 %) were men and 11 (22 %) were women. The mean age was 38.26 years (from 19 to 75).

## Results

Forty-seven patients (94 %) complained of cough, thirty-one (62%) of sputum, twenty-seven

(54%) of dyspnea, twenty-nine (58%) of chest pain and/or side pain, four (8%) of hemoptysis, eleven (22%) of chill, seven (14%) of malaise, five (10%) of nasal obstruction, five (10%) of weight loss, three (6%) of palpitation, seven (14%) of headache, thirteen (26%) of fever, two (4%) of nausea and vomiting, one (2%) of insomnia, and one (2%) of jaundice (Table 1).

Table 1. The incidence of clinical symptoms in the patients with pneumonia

Symptom	n	%
Cough	47	94
Sputum	31	62
Chest pain and/or side pain	29	58
Dyspnea	27	54
Fever	13	26
Chill	11	22
Headache	7	14
Malaise and/or fatigue	7	14
Weight loss	5	10
Nasal obstruction	5	10
Hemoptysis	4	8
Palpitation	3	6
Nausea and/or vomiting	2	4
Insomnia	1	2
Jaundice	1	2

The most common pneumonic infiltrations were localized in the lower lobes, and secondly bilaterale patchy infiltrations were seen in the chest roentgenograms. The involvement of right middle lobe was seen in the third frequency of 10% (Table 2).

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Table 2. Localisations of the pneumonic infiltrations in the patients with pneumonia

Localisation	n	%
Left lower lobe	16	32
Bilateral patchy infiltration	9	18
Right lower lobe	8	16
Right middle lobe	5	10
Right upper lobe	4	8
Left pleural opacity	3	6
Left upper lobe	2	4
Lingula	2	4
Right middle and lower lobe	2	4

All of the patients with pneumonia and sinusitis, pneumonic infiltrations were seen in the lower lobes except one patient whose infiltration was localised in the anterior segment of the left upper lobe.

Nineteen of the 50 patients had Waters roentgenogram. Sixteen of them have had the signs of sinusitis in their paranasal roentgenograms. The range of sinusitis was found 84 % (16/19) in the patients with pneumonia, whose paranasal sinus roentgenograms had been taken (Table 3).

Of the fifty patients, 19 had waters roentgenogram. Sixteen of them have had the signs of sinusitis in their paranasal roentgenograms. The sinusitis was found 84 % (16/19) in the patients with pneumonia whose paranasal sinus roentgenograms had been taken (Table 3).

Table 3. The Waters roentgenogram findings of the patients with pneumonia

Maxiller sinusitis	14	
Pansinusitis	2	
Normal	3	
The total number of abnormal Waters graphics	16	
The number of total Waters	19	
The ratio of abnormal/total Waters	16/19	% 84
The ratio of abnormal Waters/total cases	16/50	% 32

Twenty-three patients (46%) had growth of *Neisseria* and *Alfa Hemolytic Streptococcus*. The other microorganisms growth in the cultures were *Streptococcus pneumoniae*, *Beta Hemolytic Streptococcus*, *Klebsiella pneumoniae*, and *Escherichia coli*, 6%, 4%, 2%, and 2% , respectively (Table 4).

Table 4. The results of sputum cultures of the patients with pneumonia

Name	n	%
<i>Neisseria</i> and/or <i>alfa hemolytic streptococcus</i>	23	46
<i>Streptococcus pneumoniae</i>	3	6
<i>Klebsiella pneumoniae</i>	1	2
<i>Escherichia coli</i>	1	2
<i>Beta hemolytic streptococcus</i>	2	4
Not performed	19	38

Thirty patients had liver transaminase results: Mean ALT value was 40,96 IU (lowest is 10 IU ,and highest 195 IU), and AST was 49,95 IU (12 IU lowest, and 129 IU highest) (Table 5).

Table 5. Transaminase values of the patients with pneumonia

	AST	ALT
Number	23	30
Mean	49.95 IU	40.96 IU
Lowest	12 IU	10 IU
Highest	129 IU	195 IU
The rate of above 40 IU	43% (10/23)	23% (7/30)

Twelve patients had also CRP values. All were positive, mean of 4,6 IU (ranging from 1,2 to 9,6) (Table 6).

Table 6. CRP values of the patients with pneumonia

The number of CRP investigation	12
The number of Positive CRP	12
Mean CRP	4,6 IU (Ranging from 1,2 to 9,6)

Most pneumonic infiltrations were localized in the lower lobes, secondly bilateral patchy infiltrations were seen in the chest roentgenograms. The involvement of right middle lobe was seen in the third frequency (10%) (Table 2).

In all of the patients with pneumonia and sinusitis, pneumonic infiltrations were seen in the lower lobes except one patient whose infiltration was localised in the anterior segment of the left upper lobe.

## Discussion

This article focuses on pneumonia cases and its pathological features determined radiographically, microbiologically, and laboratorically. We diagnosed 50 patients with pneumonia between September 1994 and March 1996. We have reviewed the records of 50 patients diagnosed with pneumonia.

The clinical diagnosis of pneumonia depends on fever, leucocytosis, the presence of purulent sputum and the appearance of new and persistent lung infiltrates on the chest radiograph (2). Infectious agents are frequently introduced by inhalation. The lungs are endowed with a potent defense system to repel potential invasion by this route. If the upper airway passages (nose, nasopharynx) are not held many would-be invaders so, microorganisms can cause infectious diseases such as sinusitis and pneumonia in both the upper and lower airway.

Johnson demonstrated that correlation existed between the growth on cultures obtained from the nose and nasopharynx and the bacteriology of material was not existed obtained with sinus aspiration or open antrotomy (3). The patients in our study were not had nose or nasopharynx cultures. We thought that this variety in technique was the cause of the low *Streptococcus pneumoniae*, *Branhamella catarrhalis*, and anaerobic growth because of many studies from different centers showed different results (4).

Shirata showed that a chest roentgenogram evaluation of 70 patients with chronic sinusitis alone presented relatively high incidence of abnormal fibro-nodular shadow in the lung compared with 70 patients without sinusitis (5). Suetela et al. found that sinusitis was in 90% of patients with pneumonia , 81% of those with bronchitis and 65% of those with poorly controlled asthma cases. They showed that sinusitis was an important causative factor for persistent cough in children. All of the patients with pneumonia and bronchitis were cured by antibiotic administrated for 2 weeks, whereas conservative treatment of sinusitis may be as long as 6 months. In this respect are in only 60 % was less satisfactory, improvement in 18 % and without improvement in 22 % (6). Baker noticed that the physician must be alert to the possibility of unsuspected sinusitis when evaluating a patient with chronic cough, sore throat, fever of unknown origin, supraglottitis, headache , and pneumonia (7).

Wright says that a postnasal drift often causes a constant cough which can be mistaken for lower airway infections, but a direct association between these two conditions is doubtful (8). In our study however, in almost all patients with pneumonia and sinusitis, pneumonic infiltrations were observed in the lower lobes. This strongly suggests that a postnasal drift due to sinusitis will be especially aspirated during sleep, and can be cause of pneumonia. Another interesting finding is that *Neisseria* and *alfa hemolitic streptococcus* are the most frequent microorganisms growth in the sputums of the patients with pneumonia and sinusitis.

Twelve of the patients with pneumonia and sinusitis hadn't received any different treatment in addition to antimicrobial agent and/or topic and/or systemic decongestant . Although pneumonia improved after treatment, sinusitis continued, and the patients were been sent to the otolaryngolog. We thought that sinusitis may be occured due to local nasal pathology and/or different microorganisms cause pneumonia.

In our study, another interesting finding in the patients with pneumonia was that the values of plasma transaminases higher than that of were normal ranges (Table 5). Numerous non-specific biochemical abnormalities have been noted in the cases with pneumonia. The increase of transaminases may also occur (9), but there are few study about the rate of high transaminase levels in the patients with pneumonia , and it will be necessary further prospective studies in this subject.

CRP is a sensitive marker for pneumonia. A persistently high or rising CRP levels suggest failure of antibiotic treatment or the development of an infective complication (10). Our retrospective results supported this report because high CRP results presented in all patients investigated for it (Table 6).

Finally, we noticed that the physician should take into account the presence of sinusitis when evaluating a patient with pneumonia as well as the abnormalities of biochemical (increased transaminases and CRP values), microbiologic.

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