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To Study the Percentage of Different Risk Factors and Clinical Features of Non-Resolving Pneumonia in Hospitalized Adult Patients

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ABSTRACT

The microscopic air sacs called alveoli, which are distributed throughout the lungs, are mostly affected by pneumonia, an inflammatory disease of the lungs. About 450 million people worldwide are thought to be impacted by it and 4 million deaths are attributed to it annually. Finding out the relative frequency of different clinical traits and risk factors linked to persistent pneumonia in adult hospital patients was the aim of this study. Pulmonary medicine is the focus of the VSS Institute of Medical Sciences and Research (VIMSAR), where this study was conducted. With a bed capacity of one thousand, this tertiary care hospital is located in western Odisha. The study project was completed between October 2016 and September 2018. The investigation was carried out in a hospital environment as a prospective observational research project. Out of the 29 individuals that participated in the study, 80% were between the ages of 31 and 60. Ten patients (34.5%) were female and 19 patients (65.5%) were male. There were around 1.8 men for every woman. Table 1 lists the individuals who first reported with conventional lower respiratory tract infections. The patients associated with the risk factors that made up the entire sample of 29 patients are shown in Table 1. Table 2 displays the frequency of risk factors relative to the research population. Our research indicates that the rate of delayed recovery among alcoholics is 1.5 times higher than that of non-alcoholics. Similarly, the probability of smokers having a delayed recovery is 4.57 times greater than that of nonsmokers. Individuals with diabetes mellitus and chronic kidney disease were 1.7 and 3.7 times more likely, respectively, to have a recovery that was delayed. Individuals with pulmonary tuberculosis and chronic lung diseases are around 1.5 and 3 times more likely, respectively, to exhibit a delayed recovery.

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Key Words

Pneumonia, inflammatory condition, non-resolving pneumonia, nosocomial pneumonia, alveoli, tuberculosis

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INTRODUCTION

Pneumonia is an inflammatory illness of the lungs that mostly impacts the tiny air sacs called alveoli that are found all throughout the lungs. It is estimated that 450 million people throughout the world are affected by it and 4 million fatalities occur each year because of it. Delays in diagnosis and treatment can increase mortality rates by 3-5% for both nosocomial and community-acquired pneumonia[1,2]. If the issue is not handled properly, it might not be able to be resolved. Both "slowly resolving pneumonia" and "non-resolving pneumonia"[1] describe a condition in which radiographic abnormalities remain past the expected time limit. It is common for patients to experience persistent or slowly improving pneumonia. This clinical contradiction is quite prevalent, affecting between 10 and 20% of patients hospitalized with CAPD[2,3]. Pneumonia that does not rapidly clear up or resolves slowly might have a variety of reasons, including incorrect diagnosis, inadequate antibiotic therapy, impaired host defense, unusual organisms, resistant infections, non-infectious causes, TB, endobronchial lesions and others[1-5]. An incorrect diagnosis may also lead to inappropriate therapy. If the symptoms of pneumonia do not improve or only improve after being treated, a more thorough examination is required. If your pneumonia isn't getting better, you might want to look into getting a fiberoptic bronchoscopy (FOB), a CT scan of the chest and CT-guided FNAC. In order to establish an etiological diagnosis, the sample may be subjected to microbiological, cytological and histological testing. When there are no signs of improvement in the pneumonia, doctors will often start what is called an empirical anti-tubercular medication. There is also a lack of information about the origins of these problems in this area. Thus, the current study will aid in identifying the causes of non-resolving pneumonia and its clinical consequences. Targeted treatment can be determined through the use of diagnostic tools such as a CT scan of the chest, fiber optic bronchoscopy, CT-guided FNAC, microbiological and cytological examination of sputum specimens and a complete medical history and physical examination. Each of these aspects may be significant. The present study aimed at finding out the relative frequency of different clinical traits and risk factors linked to persistent pneumonia in adult hospital patients was the aim of this study.

MATERIALS AND METHODS

Pulmonary medicine is the focus of the VSS Institute of Medical Sciences and Research (VIMSAR), where this study was conducted. With a bed capacity of one thousand, this tertiary care hospital is located in western Odisha. The study project was completed between October 2016 and September 2018. The investigation was carried out in a hospital environment as a prospective observational research project. All adult patients met the criteria for a case of pneumonia that did not resolve and the sampling strategy worked well. The patients whose symptoms (cough, sputum production with or without fever greater than 100°F) didn't improve with failure of resolution of radiographic abnormalities by 50% in 2 week or completely in 4 weeks (as indicated by at least two serial chest X-rays) while receiving antibiotic therapy for at least 14 days were included in this study. People who had serious difficulty in breathing, a recent history of myocardial infarction, micro-biologically confirmed pulmonary tuberculosis or lung cancer, who were unwilling to participate in the study were not sought out for the research.

Hospitalizations were performed on a total of 29 individuals over the time frame of the study who had a likely diagnosis of persistent pneumonia. The case definition, inclusion criteria and exclusion criteria for the disease were all satisfied by each and every adult patient who was hospitalized and diagnosed with non-resolving pneumonia at the Department of Pulmonary Medicine at VIMSAR. These people included both first-time patients at the VIMSAR medical institution as well as those who had previously been treated there. When the patient was finally stabilized enough to be admitted to the hospital, a comprehensive medical history was taken. In addition to the patient's age, sex, place of employment and the length of time they have been experiencing symptoms, clinical symptoms such as coughing, a fever that is higher than 1000 degrees Fahrenheit, the production of sputum, hemoptysis, chest tightness, dyspnea and weight loss were recorded. It has been demonstrated that HIV, diabetes, chronic lung disease, chronic kidney disease and a history of ATT use are all comorbid conditions that occur together. Patients who disclosed a previous history of drug misuse were questioned further regarding their consumption of tobacco products and alcoholic beverages. The patient's medical history included information on the antibiotics that they had previously consumed the length of time that they had consumed them and the amount of time that had passed since the patient had been diagnosed with non-resolving pneumonia prior to the beginning of therapy. Clinical signs such pallor, clubbing, enlarged neck nodes, SPO2, HR and signs of consolidation like crepitations, bronchial breath sounds and whispering pectoriliquy were assessed for each patient. Sputum was examined for (Gram stain, culture sensitivity, AFB, and CBNAAT) and tests for urea, creatinine, blood sugar, RRT-ICTC, chest X-ray PA and lateral view. These exams were all sent out to be completed. Using 3%

hypertonic saline, an induced sputum examination was conducted on all patients (culture and sensitivity, AFB and CBNAAT). Since previous studies had shown that sputum induction with 3% normal saline gave better results than those achieved with normal saline the use of hypertonic saline (at a concentration of 3%), rather than normal saline was preferred. In patients for whom the etiological diagnosis remained ambiguous following the study of the generated sputum, we performed a CT scan of the thorax. CT was utilized to identify the damaged lung segments and patients underwent fiberoptic bronchoscopy. After bronchoalveolar lavage the fluid was collected and sent to AFB, CBNAAT and C/S for examination. Few cases were clinically suspected as clinical malignant, therefore a transbronchial lung biopsy, a FOB-guided biopsy of an intrabronchial growth, or a CT/USG-guided FNAC/biopsy of a lung lesion were carried out (presence of hard supraclavicular nodes, clubbing). Blood tests for c-ANCA, p-ANCA, and anti-nuclear antibody (hep-2 method) were performed on a patient who had hemoptysis. In addition, perivascular ground-glass shadows were seen on a CT scan. Participants in the trial had monthly clinical and radiological monitoring for a total of two months. Clinical outcomes were assessed at the conclusion of that time period based on early and delayed recovery (both clinically and radiologically). Improvements in respiratory symptoms (cough, shortness of breath, chest discomfort), constitutional symptoms (fever, weight loss), and radiologic clearing of shadows were used to assess whether recovery had occurred. Format of pre-made data collection forms for patients undergoing evaluation for untreated pneumonia.

Statistical analysis: The data was analyzed using the Statistical Package for the Social Sciences (SPSS), version 20, release 20.0.0. Means were used to convey quantitative data with a normal distribution, whereas simple percentages were used to express categorical data. The correlations and comparisons between the various factors were examined using a nonparametric test called the chi-square (x2) test. The numerous risk variables associated with a delayed clinical recovery constituted the basis for the computation of odds ratios, also referred to as the ratio. The significance level was established at a two-tailed probability of $p<0.05$ for all statistical analyses.

RESULTS

Out of the 29 individuals that participated in the study, 80% were between the ages of 31 and 60. Ten patients (34.5%) were female and 19 patients (65.5%) were male. There were around 1.8 men for every woman. Table 1 lists the individuals who first reported with conventional lower respiratory tract infections. The patients associated with the risk factors that made up the entire sample of 29 patients are shown in Table 1. Table 2 displays the frequency of risk factors relative to the research population.

Table 1: Frequency of clinical features

Variable	No. of patients	Percentage
Cough	29	100
Temperature	25	86.2
Hemoptysis	03	10.3
Dyspnea	21	72.4
Weight loss	17	58.6
Chest pain	23	79.3
Pallor	19	65.5
Clubbing	04	13.8

Table 2: Frequency of risk factors in the study population

Variable	No. of patients	Percentage
Cigarette smoking	6	20.6
Diabetes mellitus	04	13.8
HIV	00	00.0
Obesity	02	6.9
Chronic Lung disease	05	17.2
Tuberculosis	06	20.7
Chronic kidney disease	03	10.3
Other	06	20.7

DISCUSSION

The 29 people who took part in this study each had a medical history that recorded a sickness that lasted for more than four weeks. It seemed as though men made up the majority of the group given that the ratio of males to females was 1.8-1. Multiple studies[3,6] have revealed that males had a greater chance of acquiring a severe form of pneumonia from which they do not quickly recover. The findings of this research give more evidence to support the statements that they have made. It's possible that this is the case due to the fact that women are more likely to be housewives and spend their time at home, whereas a greater percentage of men are exposed to the virus at work. It was shown that persons between the ages of 41 and 60 made up more than half of those who participated in this study and had a slow resolution. However, studies[7,8] shown that the majority of patients (80 and 84.6%, respectively) were beyond the age of 40. According to the source that was used as evidence, the prevalent opinion believed that the drawn-out resolution was unavoidable at this juncture in ones life. According to the findings of the study, coughing was the symptom that was observed the most frequently. After this the next most common symptom was hemoptysis, followed by expectoration, fever, weight loss and trouble breathing. It was discovered that 96.6% of patients suffered fever, 53.5% experienced hemoptysis, 38.5% experienced chest pain and 33.3% experienced shortness of breath. These data were published by[9]. Coughing was present in each of the patient scenarios. In contrast, studies indicated that only 36% of patients reported fever, 38%

experienced dyspnea, 38% experienced chest pain and 28% experienced hemoptysis. However, 92% of patients experienced coughing. According to the findings, there appears to be a connection between the high infection rates of the patients and the high incidence of these symptoms. Particularly during the colder months, this high infection prevalence may be attributable to a combination of unfavorable working conditions and a lack of protective equipment. People who have a lower body mass have a greater propensity to have lower complement levels and as a consequence of their compromised immune systems, they have more frequent incidences of these symptoms. A statistically meaningful amount of weight reduction was observed by over 58.6% of the study participants. People who took part in another research study[11] saw a reduction in their body weight. This issue, as the author sees it, may be traced back to a dearth of resources for the elderly, specifically in terms of food, medical treatment and social support. According to the results of this study, smoking cigarettes is the single most important factor that contributes to a more drawn-out recovery from pneumonia. The results of this study added credence to the findings of an earlier study[10] that had found smoking to be the condition that was associated with co-occurring disorders the most frequently among their participants. Diabetes mellitus was found to be a significant risk factor for pneumonia's delayed resolution in people who made up one half of this study's sample. According to the findings of diabetes mellitus is one of the most common factors that contribute to the development of chronic pneumonia. A third examination found that those with diabetes mellitus had a slower rate of clearing pneumonia from their bodies, which was consistent with the findings of the previous study. According to the findings of this study, a compromised immune system was a key factor that contributed to the longer duration of six cases of tuberculosis infection and twelve cases of drug addiction, including smoking cigarettes. Comorbidity often results in a weakened immune system, which leads to an altered host response in affected individuals. When many diseases or conditions are present at the same time, a similar drawn-out period of recovery should be anticipated.

CONCLUSION

Our research indicates that the rate of delayed recovery among alcoholics is 1.5 times higher than that of non-alcoholics. Similarly the probability of smokers having a delayed recovery is 4.57 times greater than that of nonsmokers. Individuals with diabetes mellitus and chronic kidney disease were 1.7 and 3.7 times more likely, respectively to have a recovery that was delayed. Individuals with pulmonary tuberculosis and chronic lung diseases are around 1.5 and 3 times more likely, respectively to exhibit a delayed recovery.

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