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Original Article

Does bronchoscopy help in resolving the etiology of Non-resolving Pneumonia? Experience in a Tertiary Care Center

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Abstract

Background

Normal resolution time of pneumonia is variable. Non-resolving pneumonia is a challenging clinical problem. Etiological, patient and treatment-related factors affect outcomes. Bronchoscopy is initial diagnostic technique in evaluating these patients. The study explored the utility of bronchoscopy in diagnosing of non-resolving pneumonia.

Material and Methods

Records of the patients diagnosed with non-resolving pneumonia who underwent bronchoscopy from 20th January 2017 to 19th January 2018 were analysed. The data analyzed included demographic characteristics, clinical profile, bronchoscopic findings, chest imaging, and hospital discharge status. Non-resolving pneumonia was defined as focal infiltrates with symptoms of acute pulmonary infection and lack of clinical and radiological improvement within 12 weeks despite a minimum of 10 days treatment. For analysis descriptive statistics like mean and percentage and tabular and graphical presentation were made.

Results

Forty-five patients had non resolving Pneumonia. A total 75.0% were males with age range of 25 to 85 years and common symptom were cough with fever (75.0%) followed by hemoptysis, chest pain, and breathlessness. Bronchoscopically multiple ulcerated lesions, inflamed tracheobronchial tree with mucopurulent secretions and mass lesions were common. Etiologically 66.6 % patients had TB, followed by lung cancer, bronchiectasis and pneumonia.

Conclusion

Bronchoscopy has better utility and is the diagnostic modality of choice in establishing etiology of non-resolving pneumonia

Key words:

Bronchoscopy, Diagnostic utility, Non-resolving pneumonia,

Introduction

Pneumonia is an important cause of morbidity and mortality worldwide. Normal resolution time of pneumonia after treatment is variable. In patients with pneumonia, if there is no clinical and

radiological improvement despite at least 10 days of treatment with empirical antibiotics, the pneumonia is said to be non resolving pneumonia (NRP) [1]. NRP constitutes 15% of inpatient pulmonary consultations, 10-15% of nosocomial

pneumonias and 8% of bronchoscopies [2]. Incorrect diagnosis, inadequate therapy, impaired host defense, atypical organisms, resistant pathogens, non-infectious causes, tuberculosis, endo-bronchial lesions is the common causes of NRP [3]. NRP is a challenging clinical problem in our setting. It is difficult to treat and carries poor prognosis if it is not investigated and treated properly in time. Bronchoscopy is the preferred initial diagnostic technique in evaluating these patients [12]. Within this background we conducted the study with the aim of exploring the utility of bronchoscopy in diagnosis of NRP in our setting.

Material & Methods:

All the consecutive patients diagnosed with Non resolving Pneumonia who underwent bronchoscopy during the period of one year from 20th January 2017 to 19th January 2018 were enrolled in this hospital based study conducted at division of Pulmonary, Critical Care and Sleep Medicine in the Department of Internal Medicine at Nobel Medical College, Biratnagar, Nepal. Non resolving Pneumonia was defined as presence of focal infiltrates with symptoms of acute pulmonary infection and lack of clinical and radiological improvement and resolution within 12 weeks despite a minimum of 10 days of antibiotic treatment. Patients having community acquired pneumonia, not responding to injectable empirical antibiotics for minimum of 10 days treatment were included. The bronchoscopic findings and its utility towards making the final diagnosis was analyzed, other details studied through retrospective analysis of medical records of these patients. Basic descriptive statistics were used to analyze the data.

Results

All together 45 non-resolving pneumonia patients were select according to their clinical problem. Etiologically, patient and

treatment-related factors were recorded. The Bronchoscopy was initial diagnostic technique for evaluating all patients and the study was carried out by explored the utility of bronchoscopy for diagnosing of non-resolving pneumonia. The results were presented as follows:

During the one year period altogether forty five patients had found non resolving pneumonia with age range 21 – 85 years. It was found that most of the patients fall more than 40 years of age. Male gender was common (75.0%) and it was also found that 33.0% cover the age group in 41 – 50 years.

Table 1: Distribution of age groups in years:

Age in years	(n-45) Number	Percentage
21 – 30	5	11.1
31 – 40	8	17.8
41 – 50	15	33.3
51 – 60	7	15.6
61 – 70	7	15.6
71 – 80	1	2.2
>80	2	4.4
Total	45	100.0

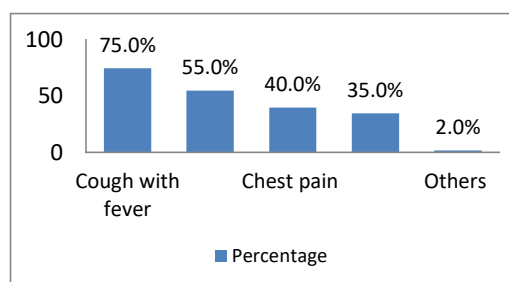


Figure 1. Common symptoms during presentation to hospital

The most common symptom was cough with fever (75.0%) followed by haemoptysis (55.0%), chest pain (40.0%), dyspnea (35.0%) and others (2.0%).

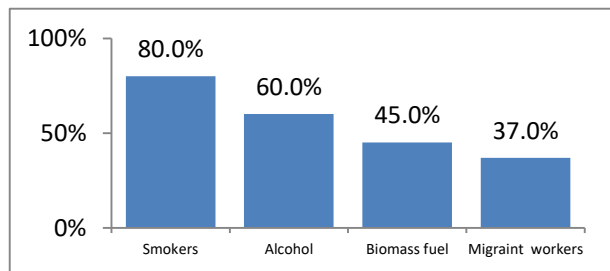


Figure 2. Common risk factors

Among 45 patients, more than 80.0% of them were smokers and 45.0% of the patients had history of exposure to indoor air pollution in the form of biomass fuel smoke and others. 37.0% of the patients had history of working abroad specially in Gulf countries and 64.0% of them had pulmonary tuberculosis.

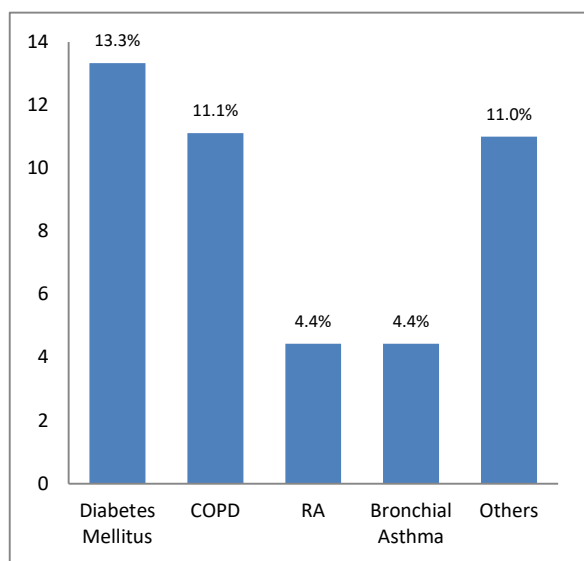


Figure 3 Common co-morbidities of patients in percentage

Diabetes mellitus and COPD were common comorbidities in patients.

Pre-bronchoscopic radiological findings:

The chest X-ray showed consolidation in 60.0% of the patients, consolidation with cavity in 25.0% and infiltrates in rest others.

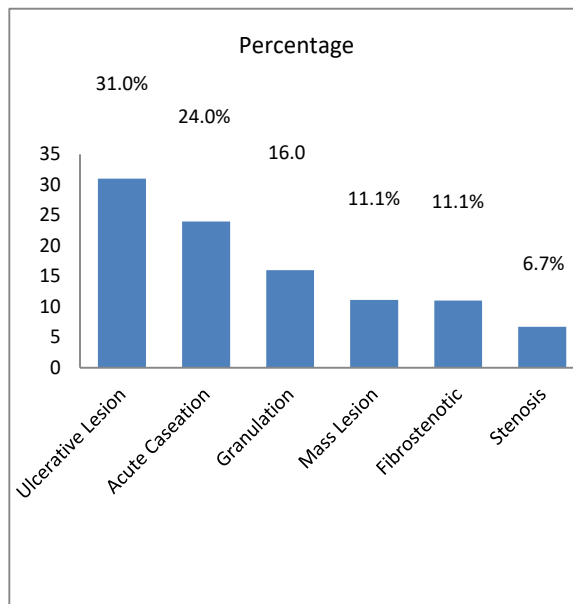


Figure 4. Bronchoscopic findings of patients

Chronic inflammatory features like ulceration, caseation and granulation were common.

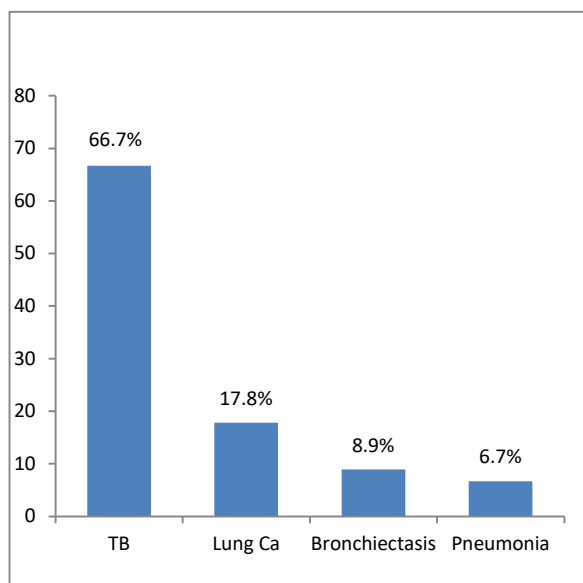


Figure 5. Etiology of non resolving pneumonia

Tuberculosis was the commonest cause of non resolution of pneumonia.

Pre-bronchoscopic radiological findings:

The chest X-ray showed consolidation in 60.0% of the patients, consolidation with

cavity in 25.0% and infiltrates in rest of them.

Discussion:

Among 45 patients of non resolving pneumonia, 71.0% were above 40 years and most of them were males. Chaudhari AD and co-workers reported that 80.0% were over the age of 40 whereas Raveendra KR and associates found that 90.0% of them were over 40 [4,5]. Males were predominant in both of the above studies. El Solh and colleagues reported that age alone has the most striking influence on resolution of pneumonia and they found that the rate of resolution on chest X- ray found to be 35.1% by 3 weeks and 60.0% by 6 weeks in patients above 70 years [6]. Fein AM and co-workers reported only 30.0% of the patients over 50 have their x-ray cleared by 4 weeks [7]. It seems that increasing age per se and associated comorbidities of aging are main risk factors for non resolution of pneumonia. Most common symptoms in one study were cough (100.0%) followed by fever (96.6%), hemoptysis (53.3%), chest pain (38.5%), and breathlessness (33.3%) [4]. Whereas, another study found that cough in (92.0%) followed by chest pain (38.0%), breathlessness (38.0%), fever (36.0%), and hemoptysis (28.0%) [8]. Our patient's symptomatology tends to conform with both above studies. More than 80% of our patients were smokers, 60.0% abused alcohol, 42.0% of have history of indoor air pollution and 37% worked in Gulf countries. These all risk factors might have contributed to causation and non resolution of pneumonia. Raveendra K R and associates found smoking in 30%, alcohol abuse in 20%, diabetes in 20%, hypertension in 10%, COPD in 11.2%, anemia in 11.2% [5]. Jayprakash B and colleagues found smoking in 60.0%, alcohol abuse in 48.0%, diabetes mellitus in 46%, COPD in 36%, hypertension in

36.0% [9]. Jay SJ co-workers found the common conditions associated with delayed resolution are advanced age, COPD and alcoholism [10]. Diabetes was the commonest comorbidity in other studies which is similar to ours [4,11]. Other risk factors and comorbidities in our study were similar to above mentioned studies with slight difference in their magnitude. The magnitude in the difference may be due to difference in, methodology, patient population, geographical and sociocultural factors among various studies. During bronchoscopic examination one study found mucosal inflammation with purulent secretions in more than 50% patients followed by inflamed mucosa (32.0%) and malignancy in 14.0% [4]. The etiologies of non resolving pneumonia in their studies were bacterial pneumonia (53.33%), bronchogenic carcinoma (26.6%), and tuberculosis in (16.6%). Raveendra KR and associates found tuberculosis in 42.5%, antibiotic resistance (25.0%), malignancy (10.0%), bronchiectasis (7.5%). Jayprakash B et al [9] found tuberculosis in (35.7%), malignancy (27.1%), resistance to empirical antibiotics in (14.0%), bronchiectasis (8.6%) [5]. on bronchoscopic examination our study showed ulcerative lesion, acute caseation and granulation suggestive of probable tuberculosis in most of the cases. In more than two thirds of the patients the etiology was tuberculosis followed by malignancy and bronchiectasis. In our clinical setting, if we suspect non resolving pneumonia, we tend to treat these patients empirically with anti-tubercular medication .We have to do so only after bronchoscopic evaluation of these patients because one third of these patients with NRP actually do not have tuberculosis. Interestingly 67.0% of Gulf workers had pulmonary tuberculosis and this finding needs further study. Whether these patients had new infection in Gulf countries or reactivation of endogenous

infection that was already present during the entry period or other factors playing role in developing clinically overt tuberculosis is not clear. Several studies in the USA have revealed that migrant farm workers confront high risks of tuberculosis [13]. Prevalence of tuberculosis among Asian migrants mainly from India, Pakistan and Nepal working in Qatar's garment industry is high [14]. The number of smokers, alcohol consumers and Gulf workers was high in our study which may be the reason for large number of tuberculosis patients in the study. In one study the diagnostic yield of bronchoscopy in non-resolving pneumonia is 85.7% whereas it is more than 90% in our study [4]. This was a retrospective analysis therefore all the necessary information could not be obtained.

Conclusion

The study concluded that, Bronchoscopy has good utility in establishing etiological diagnosis of non-resolving pneumonia and is diagnostic study of choice within appropriate clinic-epidemiological backgrounds in our setting.

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