

Full Length Research Paper

Clinico-radiological profile of lung abscess: Analysis of 120 cases

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Lung abscess is continuing to be a diagnostic and therapeutic challenge to the pulmonologists, despite remarkable advancement in investigation modalities as well as therapeutic armaments. The study was taken with the object of evaluation of varied clinical and radiological presentations, predisposing factors and etiological spectrum. This is a cross-sectional study over 120 patients with lung abscess who attended outpatient and inpatient department of Pulmonology of Nilratan Sarkar Medical College and hospital, Kolkata during the period of January 2008 to October 2009. Male was predominant than female (3:1). Major age group was above 60 years (22.5%). Mean age in the study group was 45.15 years. Most common symptom was cough with expectoration (77.5%). Poor oral hygiene was found in 64%. Overall addiction to smoking and or alcohol was 65%. Diabetes mellitus was associated in 27.5% patients. Majority of lung abscesses were solitary (82.5%) and situated in the right side (67.5%). Multiple lung abscesses predominantly found amongst immune-compromised (71.42%). Etiologically tubercular lung abscess was diagnosed in 25% patient. Bacterial cause in 20% and majority were *Klebsiella pneumoniae* (62.5%). malignancy in 12.5% and histologically were squamous cell carcinoma and adeno carcinoma. Hydatid cyst was seen in 2.5%, fungal in 2.5%. In 37.5% etiology remains undetermined. Yield from fibre optic bronchoscopy and CT guided FNAC for diagnosis of lung abscess was 38.7 and 31.58%, respectively. In Tubercular, Pyogenic and malignant variety, most of the abscesses were situated in the upper lobe.

Key words: Lung abscess, etiological type, addiction, anaerobic lung abscess.

INTRODUCTION

Lung abscess is defined as localized area of destruction of lung parenchyma with radiologically detectable opacity with an air fluid level. Usually air fluid space is more than 2 cm in diameter. Lung abscess is not a primary one but always secondary to some underlying cause. Though the etiological trend has changed with the advent of good number of antimicrobial agents and by various newer investigations, despite that, even after adequate workup in a large number of cases etiologies remain elusive. Probably, the reason is due to the limitation of facilities for diagnostic work up. The study was taken with the object of etiological aspects of lung abscess namely its

clinical presentations, predisposing factors, lobar distribution and the causative factors.

MATERIALS AND METHODS

For the present study, 120 cases of lung abscess were included on the basis of clinico radiological diagnosis (Table 3). Patient was selected both from outpatient and inpatient of chest department, Nilratan Sarkar Medical College Kolkata, India, during the period January 2008 to October 2009. In all cases a relevant history in relation to the causes was taken like history of dental extraction, sinusitis, pneumonia, malignancy, history of unconsciousness, anesthesia, alcoholism, epilepsy. Apart from history and detailed clinical examination routine investigations including examination of sputum for gram stain, acid fast bacilli ((AFB), ordinary culture sensitivity was done. In selected cases Fiber Optic Bronchoscopy, acid fast bacilli (AFB) culture from BAL fluid, CT guided FNAC, serology and other immunological investigations were done as

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Table 1. Clinical sign and symptoms (n=120).

Clinical sign and symptoms	No. of patients	Percentage
Cough with or without expectoration	93	77.5
Fever	75	62.5
Haemoptysis	45	38.3
Clubbing	69	57.5
Poor oral hygiene	78	64

Table 2. Radiological presentation (n=120).

Radiological site	Number
Right: Left: Both	81:36: 3
Simple: Multiple	99: 21
Distribution of lobe	
1) Upper	75
2) Middle	21
3) Lower	54

Table 3. Age distribution (n=120).

Age	Number	Percentage
10-20	15	12.5
21-30	18	15
31-40	18	15
41-50	21	17.5
51-60	21	17.5
>60	27	22.5

when needed.

RESULTS

In the present study, out of 120 patients (Table 2) with lung abscess male to female ratio was 3:1. Distribution of age varied between 10 - 75 years with mean age of 45.15 years. Majority belonged to the age group above 60 years were 27 (22.5%) patient followed by 51 - 60 years and 41 - 50 years group with equal frequency 21 (17.5%). lung abscess found least in the age group 10 - 20 years 15 (12.5%). Mean age for male and female were 47.3 and 36.8 years, respectively. Major ratio of male and female found in 51 - 60 years was 7:0 and above 60 years ratio was 7:2. Most common symptom was cough with expectoration found in 93 (77.5%) patients followed by fever 75 (62.5%), hemoptysis 45 (38.3%). Clubbing found in 82 patient (68.3%) and Poor oral hygiene in 78 (64%). 69 patients (57.5%) were chronic smoker and 27 patients (22.5%) regularly consumed alcohol. Overall

addiction found in 78 (65%). In the study, diabetes mellitus was found in 33 patients. Radiologically majority of lung abscesses were situated in the right lung 81 (67.5%), 36 (30%) in the left and in 3 cases (2.5%) it involved both the lung (Table 1).

Overall Lung abscess distributed highest in the upper lobe 75 (50%), followed by lower lobe 54 (36%) and least in the middle lobe 21 (14%). Detailed segmental involvement was not assessed due to economical constraint. In 99 cases (82.5%) lung abscess were solitary in nature and in 21 (17.5%) it was multiple. Multiple lung abscess were found in 15 patients (71.42%) with immuno-compromised, amongst the diabetes mellitus found in 12 (80%) cases, pregnancy in 1 patient and HIV in 2 patients. Etiologically Mycobacterium tuberculosis was diagnosed in 30 patients (25%). Of which 18 cases by detection of acid fast bacilli (AFB) in the sputum by Ziehl Neelsen (ZN stain) method. In rest 12 found from broncho alveolar (BAL) fluid smear and by BACTEC culture. Lung abscess due to pyogenic cause are found in 24 cases (20%). Ordinary Sputum culture and

sensitivity diagnosed in 12 and by BAL fluid study in another 12 patients. Specific organism detected as follows coagulase positive *Staphylococcus aureus* in 9 cases and *Klebsiella pneumonia* in 15 cases. The ratio of detection of micro-organism in ordinary culture and BAL fluid study was 3:5. Mixed organism by gram stain was isolated in 24 patients (20%).

In the present study, lung abscess is due to malignancy diagnosed in 15 (12.5%). Of which 6 cases by bronchoscopic brushing and biopsy and Squamous cell carcinoma found in 5 and adenocarcinoma in 1. Routine BAL fluid detected malignant cell by PAP smear in 12 cases. CT guided FNAC diagnosed adenocarcinoma in 7 patients and squamous cell carcinoma in 2 cases. Overall ratio of squamous and adenocarcinoma was 7:8. Fibre optic bronchoscopy performed over 93 cases and yield was found in 36 patients (38.7%). CT guided FNAC was done in 57 cases, Yield was found in 18 cases (31.58%). Malignancy found in 9 patients, 3 cases were caused by aspergillous fumigatus, 3 cases were hydatid cyst. Serological study was done in selected case for confirmation of diagnosis like Elisha antigen assay suspecting echinococcus granulosa, antigen against aspergillous fumigatus. In the study, tuberculour abscess was found more in the upper lobe, especially on the right than left with the ratio 6:4. Pyogenic abscess was similarly common in the upper lobe followed by lower and middle lobe with the ratio 5:4:2, respectively. In malignant variety, it was more common in the upper lobe followed by lower and middle lobe with the ratio 3:2:1. Major group in the study remain undetermined which represent 45 patients (37.5%). Most of them were male. History of addiction was found in 33 cases (78.57%). Most common side of involvement was on right Upper Zone.

DISCUSSION

In the present study, etiological diagnosis remains undetermined in 39 (32.5%) cases. Akharkar and Ayer (1981) observed 23.3% cases where no etiological diagnosis was made. Mean age for all patients were 45.15. Hirshberg (1999) observed similar age group. In the study, majority belonged to the age 25 - 60 years. El Solh et al. (2003) observed similar distribution. Most common symptoms were cough with expectoration, followed by fever. In the present study right lung was involved more than the left. The figure was consistent with the observation by Agarwal and Agrawal (1962). Upper lobar involvement was more frequent in both pyogenic and tuberculosis and similarly detection of pyogenic organism by sputum culture and BAL fluid was consistent with literature Schweppe et al. (1961). Amongst total cases of lung abscesses 30 (25%) case it was caused by Mycobacterial tuberculosis. Though air fluid level is not common in tubercular lung abscess but may be seen in 9 - 22% cases (Woodring and Vandiviere, 1986). Malignancy was found in 24 (12.5%) cases. Lung

abscess secondary to bronchogenic carcinoma reported in the literature varies between 2 - 25% cases that is, consistent with the study (Roy-Chowdhury, 1973).

In the present study, the right lung was involved more than the left (28 cases to 13 cases). This figure is consistent with the reports from literature Jose, (2006). Multiple lung abscess were mostly seen in immunocompromised 21 (17.5%). Amongst them, diabetes mellitus was found in 12 cases. Mansharamanin et al. (2002) observed multi lobar involvement in immunocompromised (10). In pyogenic lung abscess majority of the cases was *Klebsiella pneumonia* (Reed, 1973). Lau and Associates had found rising percentage in association with *Klebsiella*. In 39 cases, where etiology remained undetermined, most of them were male, above 30 years. Most common site was on right lower zone. There was a history of addiction in 33 cases. Clinically and radiologically it seems to be anaerobic lung abscess. Due to the limitations of facilities for diagnostic work up etiology could not be established. Probably this unknown group represent anaerobic lung abscess. Here, 53.8% occupied in the lower lobe.

Conclusion

In our study, lung abscess was more common in males (75%) and is mostly common above 60 years of age (22.5%). The commonest symptom at presentation was cough with expectoration (77.5%). More than 50% cases were found in upper lobes which were mostly due to tuberculosis, pyogenic infections or associated with bronchogenic carcinoma. Tuberculosis accounted for 25% followed by pyogenic infection (20%), malignancy (15%) and undetermined group 37.5%.

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