ORIGINAL RESEARCH

Bacteriological profile of elderly patients with acute exacerbation of chronic obstructive pulmonary disease: Our experience from VIMS, Ballari, Karnataka

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ABSTRACT
Background: WHO has estimated that 600 million people worldwide have COPD. Additionally, exacerbations lead to indirect costs because of days lost from work. COPD affects 30% of patients seen in chest clinics and constitutes 1-25% of hospital admissions all over India. Objectives: To identify and establish bacteriological profile of elderly patients with acute exacerbation of chronic obstructive pulmonary disease admitted to VIJAYANAGARA INSTITUTE OF MEDICAL SCIENCES, BALLARI.**Methods:**This is descriptive observational study conducted amongst diagnosed cases of AECOPD approached to department of Medicine VIJAYANAGARA INSTITUTE OF MEDICAL SCIENCES BALLARI during the period from JANUARY 2020 to JANUARY 2021.**Result:**Out of 131 AECOPD patients, majority of the patients were from 60-70 years i.e., 92(70.2%) Mean age of the study population was 69.42±812.5 years. Males were 92(70.2%) and females were 39(29.8%). Klebsiella pneumonia was most commonly isolated organism in our study with the prevalence of 24.4%, followed by Commensals (18.3%), Pseudomonas species (13%), E coli (12.2%).**Conclusion:**Breathlessness and cough was complained by all 131 AECOPD patients i.e., 100%. Klebsiella pneumonia was most commonly isolated organism in our study with the prevalence of 24.4%, followed by commensals (18.3%), pseudomonas species (13%), E. coli (12.2%).
Key words:AECOPD, bacterial isolates, elderly cases.

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is defined as a preventable and treatable disease with pulmonary component characterized by airflow limitation that is of not fully reversible which is usually progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases and some significant extrapulmonary effects that may contribute to the severity in individual patients. It includes emphysema, Chronic Bronchitis, Small airway disease.[1-3]
AECOPD (acute exacerbation of COPD) condition is defined as a sustained worsening of the patient's condition from the stable state (in the patient's baseline dyspnoea and cough or sputum or both and beyond normal day to day variation that is acute in onset and necessitates a change in regular medication in a patient with underlying COPD as per GOLD guideline.[4] It is characterized by presence of increased sputum volume, sputum purulence and dyspnoea.

Chronic obstructive pulmonary disease (COPD) is associated with significant morbidity and mortality, with the World Health Organization estimating its rise from being the fourth to the third leading cause of death by 2030. The mortality rates are supposed to increase by 30% every decade.[5]

Almost 95% of mortality due to chronic respiratory disease in India can be assigned   to COPD. Exacerbations of COPD have considerable impact on health care system at both primary and tertiary care levels as they are the major reason for antibiotic use and admissions. WHO has estimated that 600 million

people worldwide have COPD. Additionally, exacerbations lead to indirect costs because of days lost from work. COPD affects 30% of patients seen in chest clinics and constitutes 1-25% of hospital admissions all over India.6 AE-COPD is a common cause of emergency room (ER) visits and is a major cause of morbidity and mortality.[7,8]

Hence, we conducted the study with the objective to study bacteriological profile of elderly patients with acute exacerbation of chronic obstructive pulmonary disease admitted to VIJAYANAGARA INSTITUTE OF MEDICAL SCIENCES, BALLARI.

OBJECTIVES
To identify and establish bacteriological profile of elderly patients with acute exacerbation of chronic obstructive pulmonary disease admitted to VIJAYANAGARA INSTITUTE OF MEDICAL SCIENCES, BALLARI

MATERIALS AND METHODS
This is descriptive observational study conducted amongst diagnosed cases of AECOPD approached to department of Medicine VIJAYANAGARA INSTITUTE OF MEDICAL SCIENCES BALLARI

Place of Study: Tertiary health care centre

Duration of study: JANUARY 2020 to JANUARY 2021

Method of Collection of Data: The study was conducted over a period of 2 years from October 2018 to October 2020. All the patients with clinical features suggestive of COPD, such as progressive dyspnoea, chronic cough, chronic sputum production with history of exposure was screened and out of these, the patients fulfilling the criteria for AECOPD would be enrolled. Winnipeg criteria, which were derived from a double-blind, placebo-controlled trial that evaluated the role of antibiotics in patients with COPD with acute exacerbations.

Inclusion Criteria
- All patients diagnosed with COPD as per GOLD criteria and fulfils the criteria of AECOPD and willing to participate in our study after consent was included in the study.
- Age > 60 years, irrespective of sex.
- Clinical symptoms like increased cough, increased purulence and/or volume of expectorations, in previously diagnosed patients of COPD on the basis of exposure to risk factors, clinical history and examination.

Exclusion Criteria
- Active pulmonary tuberculosis

- Lung malignancies
- Bronchiectasis
- Patients who are already on antibiotic treatment
- Acute severe asthma
- Pneumonia

Statistical Analysis and Methods
Data was collected by using a structure proforma. Data entered in MS excel sheet and analysed by using SPSS IBM USA. Qualitative data was expressed in terms of proportions. Quantitative data was expressed in terms of Mean and Standard deviation. Descriptive statistics of each variable was presented in terms of Mean, standard deviation, standard error of mean.

Data Collection
All the patients who are known case of COPD and under treatment and has developed symptoms such as **progressive dyspnea, cough, sputum production was taken according to the** criteria of AECOPD.
Informed and written consent obtained from the patients. A detailed clinical history was taken and complete physical examination was done in all cases.

Sputum Collection
All patients were instructed to rinse the mouth with water before collection of sputum and then collect early morning deep coughed sputum into a sterile sputum container (preferably two). Thick, mucoid, purulent sputum was considered valid by microbiological department.
Sputum samples of all patients were collected in sterile containers and Samples were sent to laboratory after being labeled and numbered.

Sputum Processing
Microscopy of sputum samples with Gram's and Zeil-Neilson staining was first done to find out the organism and then all sputum samples were processed by conventional media like blood agar, MacConkey agar, chocolate agar. Organisms isolated using standard protocol process by microbiology department. Culture sensitivity were done by diffusion method.

RESULT
We included total 131 patients of diagnosed with COPD as per GOLD criteria and fulfils the criteria of AECOPD. Out of 131 AECOPD patients, majority of the patients were from 60-70 years i.e. 92(70.2%) followed by 32(24.4%) from 71-80 years and least i.e. 7(5.3%) from 81-90 years age group. Mean age of the study population was 69.42±812.5 years.

Table 1: Distribution according to age group

		Frequency	Percent
Age group in years	60-70	92	70.2
	71-80	32	24.4
	81-90	7	5.3
	Total	131	100.0

We included total 131 patients of diagnosed with COPD as per GOLD criteria and fulfils the criteria of AECOPD. Out of 131 AECOPD patients, majority of the patients were from 60-70 years i.e. 92(70.2%) followed by 32(24.4%) from 71-80 years and least i.e. 7(5.3%) from 81-90 years age group. Mean age of the study population was 69.42±812.5 years.

Table 2: Distribution according to gender

		Frequency	Percent
Gender	Male	92	70.2
	Female	39	29.8
	Total	131	100.0

In our study, males were 92(70.2%) and females were 39(29.8%). Males were predominant with male to female ratio as 2.35:1.

Table 3: Distribution according to age group

		Frequency	Percent
Complaints	Breathlessness	131	100.0
	Cough	131	100.0
	Fever	59	45.0
	Increased sputum purulence	107	81.7
	Increased sputum volume	127	96.9
	Increased wheeze	9	6.9

Breathlessness and cough were complained by all 131 AECOPD patients i.e., 100%. Increased sputum volume was complained by 127 (96.9%), increased sputum purulence by 107(81.7%) and fever by 59(45%) patients.

Table 4: Distribution according to organisms isolated

Organisms	Frequency	Percent
Klebsiella pneumonia	32	24.4
Commensals	24	18.3
Pseudomonas species	17	13
E coli	16	12.2
Coagulase negative staphylococcus	10	7.6
Staphylococcus aureus	10	7.6
Klebsiellaoxytoca	9	6.9
Citrobacter species	4	3.1
Enterobacter species	4	3.1
Acinobacter species	3	2.3
Streptococcus pneumonia	1	0.8
Streptococcus pyogenes	1	0.8
Total	131	100

Klebsiella pneumonia   was most commonly isolated organism in our study with the prevalence of 24.4%, followed by Commensals (18.3%), Pseudomonas species (13%), E coli (12.2%), Coagulase negative staphylococcus (7.6%), Staphylococcus aureus (7.6%), Klebsiellaoxytoca (6.9%), Citrobacter species (3.1%), Enterobacter species (3.1%), Acinobacter species (2.3%), Streptococcus pneumonia (0.8%) and Streptococcus pyogenes (0.8%).

DISCUSSION

We included total 131 patients of diagnosed with COPD as per GOLD criteria and fulfils the criteria of AECOPD. Out of 131 AECOPD patients, majority of the patients were from 60-70 years i.e. 92(70.2%) followed by 32(24.4%) from 71-80 years and least i.e. 7(5.3%) from 81-90 years age group. Mean age of the study population was 69.42±812.5 years.

In our study, males were 92(70.2%) and females were 39(29.8%). Males were predominant with male to female ratio as 2.35:1.

AparnaBannaravuri et al[9] reported that age group of the patients varies from 25 to 85 years with most common age group affected was 60-75 years. 68.8% were males and 32.2% were females.

Raveendran SR et al[10] in 2018 conducted study including 40 male & 30 females with 57% & 43%. They included wide range from 40 years to > 80 years with maximum patients (35%) belonging to the age group of 50 -60 years followed by 60-70 years (25%) and 40 -50 years (21.88%).

Sharma P et al[11] stated that a total of 160 patients fulfilling the inclusion and exclusion criteria were included in their study, with 122 (76.3%) males and 38 (23.7%) females with a male: female ratio of 61:19. In terms of age, the study group belonged to a wide range from 40 years to >80 years with maximum patients (35%) belonging to the age group of 50–60 years followed by 60–70 years (25%) and 40– 50 years (21.88%).

Borthakur AK et al[12]reportedthat out of 187 culture positive, the most common age group was fifty to sixty years (88%). The next common age group was more than sixty year (12%). Out of 272 clinically diagnosed cases of COPD, 192 were males and 65 were females. The ratio of males to females is 2:1

The findings of above-mentioned authors were almost comparable with our study findings.

Isolates

Klebsiella pneumonia was most commonly isolated organism in our study with the prevalence of 24.4%, followed by Commensals (18.3%), Pseudomonas species (13%), E coli (12.2%), Coagulase negative staphylococcus (7.6%), Staphylococcus aureus (7.6%), Klebsiellaoxytoca (6.9%), Citrobacter species (3.1%), Enterobacter species (3.1%), Acinobacter species (2.3%), Streptococcus pneumonia (0.8%) and Streptococcus pyogenes (0.8%).

Klebsiella pneumonia is the predominant organism associated strongly with all the age groups in our study. Staphylococcus aureus are strongly associated with elderly age group i.e. 80-90 years whereas Klebsiellaoxytoca is second common most organism that is strongly associated with 70-80 years age group. (p<0.05)

AparnaBannaravuriet al[9] reported that K. pneumoniae was isolated predominantly (49.0%) followed by (33.0%) Pseudomonas, (7.5%) Moraxella catarrhalis, (5.6%) Staphylococcus epidermidis, (2.8%) Streptococcus pneumoniae, (1.8%) E coli.

Raveendran SR et al[10]isolated in significant concentration in sputum as noted in: Streptococcus pneumonia (14 cases,27%), Hemophilus influenza (10 cases,20%), Pseudomonas aeruginosa (7 cases, 14%), Moraxella catarrhalis (6 cases, 12%), Escherichia coli (4 cases,8%), Staphylococcus aureus (3 cases, 6%), Citrobacterfreundii (3 cases,6%), Klebsiella pneumonia (2 cases,4%), Acinetobacterbaumannii (1 case,2%), Proteus mirabilis (1 case, 2 %).

KuwalA et al[13]isolated were *Pseudomonas aeruginosa*(38.23%), *Klebsiellapneumoniae*(29.41%), *Staphylococcus aureus*(23.53%), *Streptococcus pneumoniae*(5.88%), and *Acinetobacter*spp. (2.94%).

CONCLUSION

- Majority of the patients were from 60-70 years i.e., 92(70.2%)
- Males were predominant with male to female ratio as 2.35:1.
- Breathlessness and cough were complained by all 131 AECOPD patients i.e., 100%.
- Klebsiella pneumonia was most commonly isolated organism in our study with the prevalence

of 24.4%, followed by commensals (18.3%), pseudomonas species (13%), E. coli (12.2%).

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