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An Assessment of Clinical Profile & Outcome in Patients with Community Acquired Pneumonia (CAP)

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ABSTRACT

Introduction: Pneumonia is a disease known to mankind from antiquity.

Objectives: The study objective is to assess demographic profile of patients and correlate with clinical & radiological findings and to identify various etiological factors & correlate in different types of pneumonia.

Methodology: A Prospective clinical observational study was conducted in October 2018 to March 2019 among 50 patients admitted under Department of General Medicine who were diagnosed as community acquired pneumonia during admission at GMERS General Hospital Junagadh, Gujarat.

Results: The incidence of CAP was more common in female (56%) than in men (44%). Fever was the commonest (47, 94%) presenting complaint followed by cough 42(84%) and breathlessness 36(72%). Lobar pneumonia was most common (85.7%) in the patients having predisposing lung pathology and Bronchopneumonia was most common (71.4%) in diabetic patients (Table-5). Majority (17, 34%) patients had PSI class I followed by PSI class II (14, 28%).

Conclusions: Mean age was 47+1.6. Significant difference noted between types of pneumonia and different etiological factors. In bacterial pneumonia, Pleural effusion (20.8%) was major complication whereas in viral pneumonia, Respiratory failure (47.3%) was major complication.

Key words: Community acquired pneumonia (CAP), Etiology and Types of pneumonia

BACKGROUND

Pneumonia is a disease known to mankind from antiquity[1,2,3]. Pneumonia is an acute inflammation of the pulmonary parenchyma that can be caused by various infective and non-infective origins, presenting with physical and radiological features compatible with pulmonary consolidation of a part or parts of one or both lungs[4-8]. Pneumonia signifies a pulmonary inflammatory process. The most significant and striking feature of which is consolidation[9,10]. Community acquired pneumonia (CAP) is an acute illness acquired in the community with symptoms suggestive of LRTI. Together with presence of a chest radiograph of intra pulmonary shadowing which is likely to be new and has no clear alternative cause. Pneumonia is one of the leading causes of death and morbidity, both in developing and developed countries and is the commonest cause (10%) of hospitalization in adult and children[11-15]. More and more newer microbiological agents some of which are well known and some are very new pathogens has revolutionized the understanding of pneumonia and this led to the wide use of modern antibiotics. With the beginning of antibiotic era, the mortality rate leveled off and remained fairly constant. This mortality rate is heavily weighted against elderly[16-

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[19]. This predilection of pneumonia for elderly is not new and led William Osler in 1898 to describe as 'friend of the aged'. Several prospective studies have shown that risk factors for community acquired pneumonia are COPD, diabetes mellitus, renal insufficiency, congestive cardiac failure, coronary artery disease, malignancy, chronic neurologic disease, chronic liver disease, alcoholism and smoking[20-22]. There is lack of scientific research in our population about PSI score as prognostic score for outcome in CAP. This study attempts to use PSI score as prognostic markers for in hospital outcome in CAP. So, the study was conducted with following objectives. (1) To assess demographic profile of patients and correlate with clinical & radiological findings. (2) To identify various etiological factors & correlate in different types of pneumonia.

MATERIALS AND METHODS

A Prospective clinical observational study was conducted in October 2018 to March 2019 among 50 patients admitted under Department of General Medicine who were diagnosed as community acquired pneumonia during admission at GMERS General Hospital Junagadh, Gujarat. Consent of institutional ethics committee was taken.

Inclusion Criteria: (Age>12 years, Clinical symptoms like fever, cough with or without expectoration, Pleuritic chest pain, dyspnea and altered sensorium. Clinical Signs like tachypnea, reduced chest movements, dull percussion note, bronchial breath sounds, increased vocal fremitus and vocal resonance and crepitation. Radiological evidence of pneumonia without any clinical evidence of pneumonia will also be included)

Exclusion criteria: (Hospital acquired pneumonia, Lung malignancy, Aspiration pneumonia, Pregnancy, PLWHA, Neutropenic patients)

Study was conducted among patients with above inclusion & exclusion criteria. Details regarding study and their objectives were discussed with patients. Informed consent of them was taken prior to study. Those who denied for the same were excluded from study. Fully structured Performa, which was specially designed and pre-tested, was used for data collection purpose. The Performa has different components e.g. detailed relevant history, clinical examination, necessary investigations etc. The diagnosis made in each of these cases was noted down. The patients were classified according to PSI score classification. The patients were given different group of antibiotics according to their general condition and had given supportive treatment according to their investigation. Data entry was carried out is MS Excel and data analysis was done by using appropriate statistical software and applying suitable statistical tests e.g. Chi-square test, proportion, Mean, Standard Deviation etc.

RESULTS

In the present study, CAP was more common in female (56%) than in men (44%). Age of 32 (64%) patients was ≤ 50 years and age of 18 (36%) patients was > 50 years. The highest proportion (15, 30%) of CAP was found in 41-50 years age group followed by 51-60 years 9(18%) (Table-1). Overall fever was the commonest (47, 94%) presenting complaint followed by cough 42(84%) and breathlessness 36 (72%) (Table-2). In the present study, cough 28 (87.5%) was the most common complaint in young age patients and fever 18(100%) was the most common complaint in old age patients (Table-3).

Pneumonia severity Index score (PSI) was mentioned in Table-4. Majority 17(34%) patients had PSI class I followed by class II (14, 28%) and class III (9, 18%). Lobar pneumonia was most common (6 out of 7, 85.7%) in the patients having predisposing lung pathology and Bronchopneumonia was most common (5/7, 71.4%) in diabetic patients.

Table 1: Age wise distribution among CAP patients (N=50)

Age (years)	Male (n=22) (%)	Female (n=28) (%)	Total (n=50) (%)
<21	1 (4.5)	1 (3.6)	2 (4)
21-30	2 (9)	5 (17.8)	7 (14)
31-40	2 (9)	6 (21.4)	8 (16)
41-50	7 (31.8)	8 (28.6)	15 (30)
51-60	3 (13.6)	6 (21.4)	9 (18)
61-70	5 (22.7)	2 (7.1)	7 (14)
>70	2 (9)	-	2 (4)
Age ≤50 Years	12 (54.5)	20 (71.4)	32 (64)
Age >50 Years	10 (45.4)	8 (28.5)	18 (36)
Mean Age ±SD	52±1.8	43±1.3	47±1.6

Table 2: Gender wise Presentation of clinical features in CAP patients

Clinical features*	Male (n=22) (%)	Female (n=28) (%)	Total (n=50) (%)
Fever	21 (95)	26 (92)	47 (94)
Cough	20 (90)	22 (78)	42 (84)
Expectoration	11 (50)	11 (39)	22 (44)
Breathlessness	17 (77)	19 (67)	36 (72)
Pleuritic chest pain	7 (31)	10 (35)	17 (34)
Haemoptysis	2 (9)	1 (3)	3 (6)
Loss of weight	4 (18)	3 (10)	7 (14)

(*= multiple answers)

Table 3: Presentation of clinical features according to Age group

Clinical features*	Age ≤50 yrs (n=32) (%)	Age >50 yrs (n=18) (%)	Total (n=50) (%)
Fever	25 (78.1)	18 (100)	47 (94)
Cough	28 (87.5)	14 (77.7)	42 (84)
Expectoration	13 (40.6)	9 (50)	22 (44)
Breathlessness	23 (71.8)	13 (72.2)	36 (72)
Pleuritic chest pain	11 (34.3)	6 (33.3)	17 (34)
Haemoptysis	1 (3.1)	2 (11.1)	3 (6)
Loss of weight	4 (12.5)	3 (16.7)	7 (14)

(*= multiple answers)

Table 4: Classification according to pneumonia severity index (PSI) score (N=50)

Class	Male (n=22) (%)	Female (n=28) (%)	Total
I	4(18.1%)	13(46.4%)	17(34%)
II	5(22.7%)	9(32.1%)	14(28%)
III	6(27.2%)	3(10.7%)	9(18%)
IV	5(22.7%)	3(10.7%)	8(16%)
V	2(9%)	0	2(4%)

Chisquare 8.8; P value 0.06

Table 5: Comparison between risk factors and radiological findings

Risk Factor*	Bacterial Pneumonia (N=24) (%)	Viral Pneumonia (N=19) (%)
URTI	4 (16.7)	8 (42.1)
DM	3 (12.5)	2 (10.5)
Lung pathology	5 (20.8)	2 (10.5)
Smoker	9 (37.5)	3 (15.8)
GERD	2 (8.3)	2 (10.5)
Other	1 (4.2)	2 (10.5)

(*= multiple answers)

In the present study, Bacterial pneumonia was most common in smokers (9/12, 75%) and Viral pneumonia was most common in patients having preceding URTI (8/12, 66.6%) (Table-5). Majority (6, 33.3%) old aged (>50 yr) patients required NIMV/IMV. Higher sickness absenteeism seen in older age (P:0.006). No gender wise difference noted for sickness absenteeism (P:0.77) (Table-6).

In the present study, secondary outcome (O2 support, NIMV/IMV, complications) was worse in diabetics, smokers and patients with previous lung pathology. Smoking (12, 54%) was the most common risk factor in men and URTI (8, 28.5%) was the most common risk factor in female patients.

Bacterial pneumonia (24, 48%) was most common etiology in patients followed by viral pneumonia (19, 38%), fungus (2, 4%) and others (5, 10%). Among bacterial pneumonia, pneumococci was most common (14, 28%) etiological agent followed by staphylococci (2, 4%). Lobar pneumonia (27, 54%) was the most common radiological feature on chest x ray followed by bronchopneumonia (19, 38%). In Lobar pneumonia, bacterial organism (18, 75%) was most common etiology followed by Virus (6, 31.5%). In Bronco pneumonia, viral pathogen (10, 52.6%) was most common etiology followed by bacterial organism (4, 16.6%). In Bacterial pneumonia, pleural effusion (5, 20.8%) was most common complication followed by Respiratory failure (3, 12.5%) and septic shock (2, 8.3%). In Viral pneumonia, Respiratory failure (9, 47.3%) was most common complication followed by pleural effusion (1, 5.3%) and septic shock (1, 5.3%).

Table 6: Gender and Age wise distribution of Secondary outcome of patients

Particulars*	Sickness absenteeism ≤10 days	Sickness absenteeism >10 days	Chi-square	P value
Gender				
Male	15 (45.5)	7 (41.2)	0.08	0.77
Female	18 (54.5)	10 (58.8)		
Age				
Age ≤50 years	26 (78.8)	6 (35.3)	7.4	0.006
Age >50 years	7 (21.2)	11 (64.7)		

(P Value: <0.05 indicates significant level)

DISCUSSION

In the present study 50 patients of community acquired pneumonia (CAP) were studied with an objective to study etiological profile, clinical & radiological profile, hospital outcome, the applicability of PSI score for outcome etc. Mean age of male was 52±1.8 and mean age of female was 43±1.3. In present study most common presenting complaint was fever (94%) followed by cough and breathlessness. In previous other studies had different clinical presentation e.g. in Mac Fariene study[14] of CAP, cough (92%) was most common presenting complaint followed by fever (86%) and breathlessness (67%). In Joshua P. Metlay & Michel J Fine study of CAP[21], cough was most common presenting complaint (92%) followed by fever (88%) and breathlessness (71%). There was no Age wise (P: 0.9) significant difference noted among different clinical complaints (Table-3). Gender wise PSI class I to V score was mentioned in Table-4 but No clear significant difference was noted (P: 0.06). Different Risk factors were noted in Table-5 and comparison was done among types of pneumonia but No significant difference was found (P: >0.05). Bacterial organism and Viral pathogens were major etiological factors followed by fungus & other unidentified factors. There was significant difference noted between Types (lobar/Broncho) of pneumonia and different etiological factors (bacterial/ Viral pathogens) (P: 0.01, Chi-square value: 6.03). Higher sickness absenteeism seen in older age (P:0.006) (Table-6).

In present study Virus (19, 38%) was most common pathogen in CAP followed by Pneumococcal (Bacterial) pneumonia (14, 28%). In previous other study like study of Larry G Reimer[19] (76%) and study of Sanraj K Basi[20] (73%), Pneumococcal (Bacterial) pneumonia was most common etiology. Pleural effusion, Respiratory failure, septic shock etc. were different complications among bacterial / viral pneumonia. But no clear significant difference was noted among them (P: 0.06, Chi-square value: 3.4)

CONCLUSION & RECOMMENDATION

Majority of patients were ≤50 Years (64%). Mean age was 47±1.6. Fever was the commonest presenting complaint 47(94%) followed by cough 42(84%) and breathlessness 36(72%) Majority (17, 34%) patients had PSI class I followed by PSI class II (14, 28%). No gender wise significant difference was among different PSI class (P: 0.06). Significant difference noted between types of pneumonia and different etiological factors (P: 0.01, Chi-square value: 6.03). Lobar pneumonia (27, 54%) was the most common radiological feature on chest x ray followed by bronchopneumonia (19, 38%). Higher sickness absenteeism was seen in older age (P: 0.006) but no gender wise difference was noted for the same (P:0.77). In bacterial pneumonia, Pleural effusion (20.8%) was major complication whereas in viral pneumonia, Respiratory failure (47.3%) was major complication.

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