

Comparison of Demographic Profile, Clinical Features and Comorbidities in Complicated Vs Uncomplicated Young Patients of Community Acquired Pneumonia Presenting to a Tertiary Care Centre

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ABSTRACT

INTRODUCTION: Much research has been conducted in recent decades to determine prognostic factors for adverse outcome in patients hospitalized for CAP, including concomitant diseases and clinical parameters on admission. There is a large body of evidence in this field in the general population, less focus was put in younger group of patients, even though several recent studies showed that there is an increasing number of hospital admissions due to CAP among patients less than 60 years old.

AIMS & OBJECTIVES: To compare demographic profile, clinical features and comorbidities in uncomplicated vs complicated young patients of community acquired pneumonia.

RESULTS: In our study mean age of hospitalisation was 48.61% as compared to 52.39% in uncomplicated hospitalisation. Our study had more females constituting 59% of total patients. Comorbidities were significantly associated with complicated hospitalisation. Chest pain (p value=0.001), fever and breathlessness were significantly present in patients with complicated hospitalisations than uncomplicated hospitalisation.

CONCLUSION: Complicated hospitalisations in young patients of community acquired pneumonia is associated with certain specific demographic and clinical parameters and comorbidities which are different from those in uncomplicated patients

Keywords: Community Acquired Pneumonia, CAP, demographic profile

INTRODUCTION

Pneumonia is defined as an acute infection of the lung parenchyma that is accompanied by symptoms of acute illness [1]. Typically, the gold standard for diagnosis is the presence of new pulmonary infiltrates, as observed by X-ray, in combination with compatible clinical symptoms, and laboratory and microbiological findings [2]. The most common classification of pneumonia is based on the origin of the infection because this factor implies different etiology, prognosis and treatment. Therefore, we distinguish community acquired pneumonia (CAP) from hospital acquired pneumonia (HAP), ventilator associated pneumonia (VAP), and health care associated pneumonia (HCAP), a pneumonia with risk factors that are

associated with the healthcare environment [3]. Pneumonia is a major public health problem and its incidence varies among countries from 1.6 to 11 per 1,000 adults, with rates of hospitalization between 40% and 60%. In the United States, CAP is the sixth leading cause of death, affecting more than 4 million adults and accounting for more than 1 million hospital admissions per year [4,5].

Much research has been conducted in recent decades to determine prognostic factors for adverse outcome in patients hospitalized for CAP, including concomitant diseases and clinical parameters on admission [9]. The most frequent immediate causes of death were respiratory failure (38%), cardiac conditions (13%), and infectious conditions (11%); the most frequent underlying causes of death were neurological conditions (29%), malignancies (24%), and cardiac conditions (14%). Pneumonia-related deaths were 7.7 times more likely to occur within 30 days of presentation compared with pneumonia-unrelated deaths. Factors independently associated with pneumonia-related mortality were hypothermia, altered mental status, elevated serum urea nitrogen level, chronic liver disease, leukopenia, and hypoxemia. Factors independently associated with pneumonia-unrelated mortality were dementia, immunosuppression, active cancer, systolic hypotension, male sex, and multilobar pulmonary infiltrates. Increasing age and evidence of aspiration were independent predictors of both types of mortality. For patients with community-acquired pneumonia, only half of all deaths are attributable to their acute illness. Differences in the timing of death and risk factors for mortality suggested that future studies of community-acquired pneumonia should differentiate all-cause and pneumonia-related mortality [6].

Although there is a large body of evidence in this field in the general population, less focus was put in younger group of patients, even though several recent studies showed that there is an increasing number of

hospital admissions due to CAP among patients less than 60 years old [7].

AIMS & OBJECTIVES

1. To categorize patients of young community acquired pneumonia into uncomplicated and complicated.
2. To compare demographic profile, clinical features and comorbidities in uncomplicated vs complicated young patients of community acquired pneumonia.

MATERIAL & METHODS

This study is a prospective study done in the Department of Medicine, Sher I Kashmir Institute of Medical Sciences, J&K, India for a period of 2 years .100 cases, 60 years old or younger, who were diagnosed as CAP (defined as pneumonia identified 48 hours or less from hospitalization) were recruited and data was collected.

INCLUSION CRITERIA:

Community acquired pneumonia was defined as an acute illness (fewer than 14 days of symptoms), the presence of new chest infiltrates, and clinical features suggestive of acute pneumonia. The clinical features required were one of group A (fever $>37.8^{\circ}\text{C}$, hypothermia $<36^{\circ}\text{C}$, cough and sputum production) or two of B (dyspnea, pleuritic pain, physical findings suggestive of lung consolidation and leukocyte count greater than 10,000 or less than 4000). These criteria are consistent with the published guidelines of community acquired pneumonia [8].

EXCLUSION CRITERIA:

These include:

- (1) Hospitalization for any cause other than CAP during the 30 days prior to admission,
- (2) Hospital-acquired pneumonia (defined as pneumonia which was diagnosed more than 48 hours after admission).
- (3) Patients with severe immunodeficiency as defined by the Centres for Disease Control Criteria for patients with

acquired immune deficiency syndrome [9].

- (4) Patients receiving treatment with corticosteroids equivalent to prednisolone at more than 20 mg/day for more than 14 days.
- (5) Patients receiving immunosuppression after organ transplantation.
- (6) Patients receiving cyclosporine, cyclophosphamide, or azathioprine.

COMPLICATED HOSPITALIZATION was defined as at least one of the following parameters: hospitalization longer than 10 days, admission to ICU and in-hospital mortality. Otherwise, the hospitalization was defined as uncomplicated.

STATISTICAL ANALYSIS

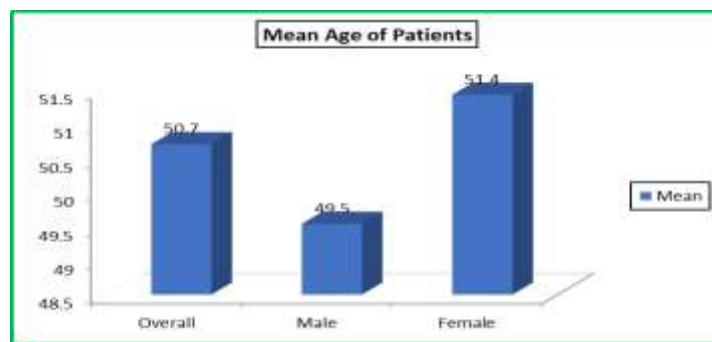
The recorded data was compiled and entered in a spread-sheet (Microsoft Excel) and then

exported to data editor of SPSS. Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Continuous variables were summarized as Mean±SD and categorical variables were summarized as percentages. Student’s independent t-test was employed for comparison of continuous variables. Chi-square test or Fisher’s exact test, whichever appropriate, was used for comparison of categorical variables. Graphically the data was presented by bar diagrams. A P-value of less than 0.05 was considered statistically significant.

RESULTS

Table 1a: Age and Sex Distribution of Patients

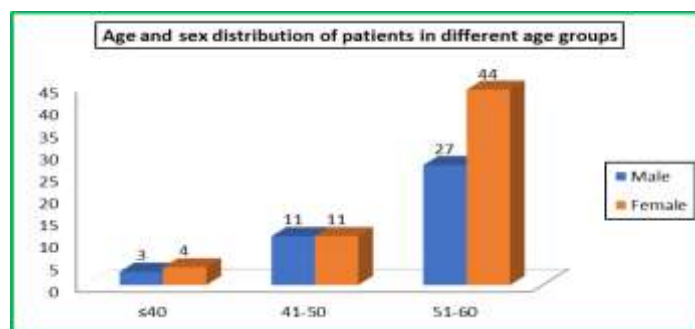
AGE	No.	Mean (in years)	SD	p-value
Over All	100(100%)	50.7	8.84	-
Male	41(41%)	49.5	8.81	0.296 (NS)
Female	59(59%)	51.4	8.85	



Our study comprised of 100 patients of community acquired pneumonia (CAP), the mean age of these patients was 50.7 years. Our study had more females constituting 59% of total patients with mean age of 51.4 years as compared to males who were lesser in number constituting 41% of total patients with mean age of 49.5 years.

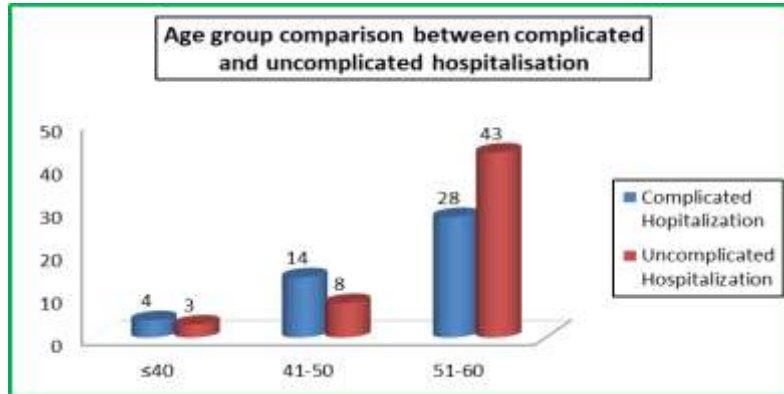
Table 1b: Age and sex distribution of patients in different age groups

Age group	Males (N=41)	Females (N=59)	Total (N=100)
≤40	3(7.3%)	4(6.7%)	7(7%)
41-50	11(26.8%)	11(18.6%)	22(22%)
51-60	27(65.8%)	44(74.5%)	71(71%)
Total	41(100%)	59(100%)	100(100%)



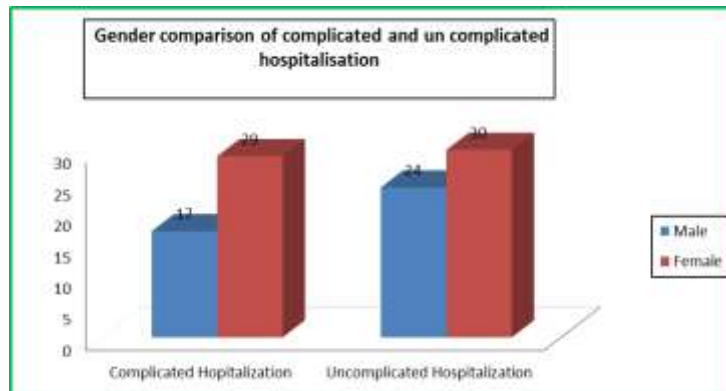
The above table shows that most of the patients were in the age group of 51-60 years constituting 71% of total patients.

Age group	Complicated Hospitalization		Total N=100
	Yes N=46	No N=54	
≤40	4(57%)	3(43%)	7(100%)
41-50	14(63%)	8(37%)	22(100%)
51-60	28(39.4%)	43(60.5%)	71(100%)
Total	46(46%)	54(54%)	100(100%)



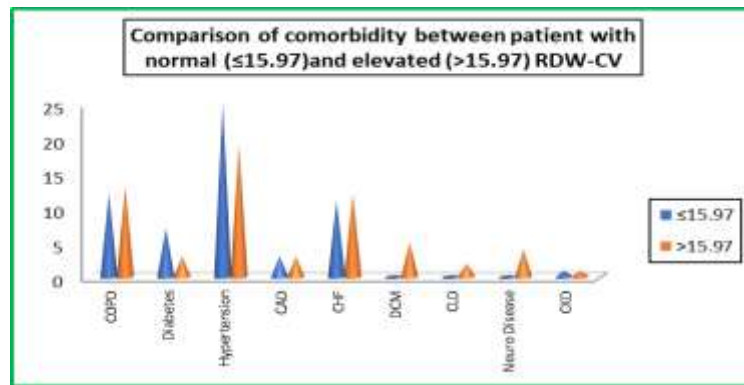
As shown in above table, age group with highest fraction of complicated hospitalisations of 63% was 41-50 years.

Sex	Hospitalization		Total
	Complicated	Uncomplicated	
Male	17(36.95%)	24(44.44%)	41(41%)
Female	29(63.04%)	30(55.55%)	59(59%)
Total	46(100%)	54(100%)	100(100%)
p-value=0.448			



As shown in the table complicated hospitalisation was present more in females constituting 63.04 % of total complicated hospitalisations as compared to males who constituted only 36.95 % of complicated hospitalisation with a non significant p value (0.448)

Comorbidity	Hospitalization		Total	p-value
	Complicated N=46	Uncomplicated N=54		
Smoking	29(63%)	31(57%)	60(60%)	0.566
COPD	16(34%)	9(16%)	25(25%)	0.032
Diabetes	10(21%)	0(0%)	10(10%)	<0.001
Hypertension	24(52%)	20(37%)	44(44%)	0.094
CAD	6(13%)	0(0%)	6(6%)	0.008
CHF	12(26%)	11(20.3%)	23(23%)	0.330
DCM	5(10.8%)	0(0%)	5(5%)	0.018
CLD	2(4.3%)	0(0%)	2(2%)	0.209
Neurological disease	1(2.1%)	3(5.5%)	4(4%)	0.372
CKD	1(2.1%)	1(1.8%)	2(2%)	0.711



The above tables shows that DCM-dilated cardiomyopathy (p value =.01) and Neurological diseases(p value =.02) were significantly associated with elevated RDW-CV.Also most common comorbidity associated with elevated RDW-CV was hypertension(46.3%) and COPD(31.7%) and CHF(29.2%).

Table 3: Comparison of various clinical variables in complicated and uncomplicated hospitalization groups

Clinical Variable	Complicated Hospitalization Group (N=46)	Uncomplicated Hospitalization Group (N=54)	P-value
Mean Age (SD)	48.61 (8.88%) (24-59) *	52.39 (8.50%) (23-59) *	0.032
COMORBIDITY	39(84.7%)	31(57.4%)	0.006
COUGH	41(89.1%)	47(87.03%)	0.838
BREATHLESSNESS	41(89.1%)	36(66.6%)	0.008
CHEST PAIN	19(41.3%)	6(11.11%)	0.001
ALTERED SENSORIUM	18(39.1%)	11(20.03)	0.039
HEMOPTYSIS	7(15.2%)	15(27.7%)	0.131
FEVER	46(100%)	47(87.03%)	0.011
EXPECTORATION	30(65%)	35(64.8%)	0.966

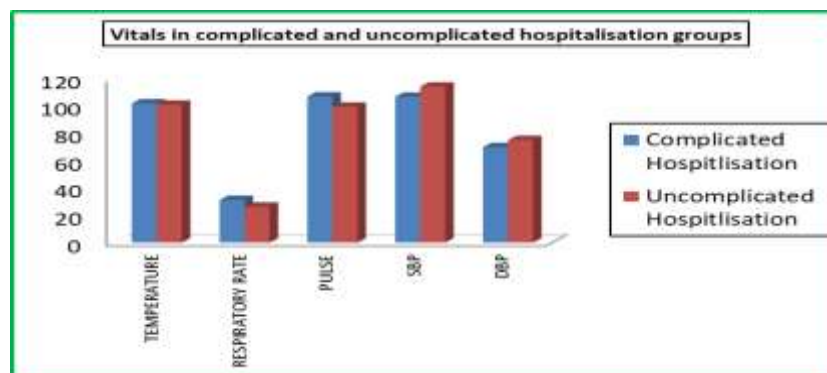
(range)*

As shown in the above table the mean age of the patients with complicated hospitalisation was 48.6 years as compared to 58.39 years in patients with uncomplicated hospitalisation (p value=.032). Comorbidity was more common in complicated hospitalisation (p value=.006). Chest pain (p value=.001), fever (p value=.011) and breathlessness (pvalue 0.008) was significantly present in patients with complicated hospitalisations than uncomplicated hospitalisation. Fever (93%) was the most common symptom in patients overall followed by cough (88%) and breathlessness (77%).

Table 5: Vitals in complicated and uncomplicated hospitalisation groups

Vital	Overall		Complicated Hospitalisation Group		Uncomplicated Hospitalisation Group		P-value
	Mean	SD	Mean	SD	Mean	SD	
TEMPERATURE (°F)	101.9 (97-104) *	1.87	101.6	1.4	100.7	2.14	0.025
RESPIRATORY RATE (PER MINUTE)	28.5 (18-42) *	5.28	31.1	4.98	26.2	4.48	<0.001
PULSE (PER MINUTE)	102.7 (70-161) *	14.26	106.7	14.58	99.2	13.13	0.008
SBP(mm hg)	110.5 (70-150) *	15.03	106.5	18.05	113.9	10.93	0.013
DBP(mm hg)	72.5 (40-90) *	11.48	69.7	11.28	74.9	11.2	0.025

(range)*



As shown in the above table, elevated temperature (mean 10.9°F and P value =0.025, increased respiratory rate (mean 31.1 and p value <.001), tachycardia (mean 106.5 and p value =0.008) were significantly present in complicated hospitalisation as compared to uncomplicated hospitalised patients. Also systolic blood pressure (mean 106.5 and p value=.013) and diastolic blood pressure (mean 74.9 and p value=0.025) were significantly lower in complicated hospitalisations.

DISCUSSION

AGE

Most of the patients in our study were in the age group 51-60 years constituting 71% of total patients, with complicated hospitalisation present in 28% patients of this age group. However, patients in age group 41-50 years were 22% of total but 63% of patients of this age group had complicated hospitalisation. Also the mean age in complicated hospitalisation was 48.61% as compared to 52.39% in uncomplicated hospitalisation.

Some studies like one by Brancati et al [10] go with our study, but most of the other studies like done by Waterer et al [11] and other investigators [12,13,14] supports finding, that increasing age in CAP has increase in morbidity.

GENDER

As shown in the above table (2d) complicated hospitalisation was present more in 63.04% females patients as compared to males (36.95%), most of the studies suggest that male gender have more morbidity than female in community acquired pneumonia [15,16,17]. However, some studies like done by Takahashi et al [18] support our study in which females have more morbidity.

COMORBIDITIES

Comorbidities were significantly associated with complicated hospitalisation (P value=0.006). The comorbidities which were significantly associated with complicated hospitalisation in our study were Diabetes mellitus (p value<.001), CAD-Coronary artery disease (p value =0.008), DCM-Dilated cardiomyopathy (p value =.018) & COPD-Chronic obstructive pulmonary disease) (p value =0.032), this data is consistent with many studies [10,12,13]

SYMPTOMS

In our study Chest pain (p value=.001), fever (p value =0.011) and breathlessness were significantly present in patients with

complicated hospitalisations than uncomplicated hospitalisation. Similar results were noticed by Klapdor et al [19] who noticed CAP in the younger patient is a clinically distinct entity. In his study Data from the prospective multicentre Competence Network for Community Acquired Pneumonia Study Group (CAPNETZ) database were analysed for potential differences in baseline Characteristics in 7,803 patients. The proportion of younger patients (aged <65 yrs) was 52.3%. Fever (61.4% versus 54.2%) and chest pain (49% versus 31.9%) were more frequent in those aged <65 yrs. However in contrast to this many studies like British thoracic study and study by Ortquist etal [20] support the other way because a significant number of patients in these studies were elderly >65 years of age.

RESPIRATORY RATE, TEMPERATURE AND PULSE RATE

A raised respiratory rate and tachycardia has emerged as one of the most valuable indicators of disease severity in both univariate and multivariate analysis across all age groups [16,20]. In our study elevated temperature (mean 31.1 and P value =.025, increased respiratory rate (mean 31.1 and p value <.001), tachycardia (mean 106.5 and p value =.008) were significantly present in complicated hospitalisation as compared to uncomplicated hospitalised patients consistent with many studies [21,15].

CONCLUSION

Complicated hospitalisations in young patients of community acquired pneumonia is associated with certain specific demographic and clinical parameters and comorbidities. In our study mean age of hospitalisation was 48.61% as compared to 52.39% in uncomplicated hospitalisation. Our study had more females constituting 59% of total patients. Comorbidities were significantly associated with complicated hospitalisation. Chest pain (p value=.001), fever and breathlessness were significantly present in patients with complicated

hospitalisations than uncomplicated hospitalisation.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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