Evaluation of Treatment Efficiency in Hospitalized Patients Due to Community Acquired Pneumonia in Kerman-Iran

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Abstract: Community-acquired pneumonia (CAP) is a major cause of mortality and disability at all ages. The time of clinical response to treatment is important. With considering that chronic obstructive pulmonary disease (COPD) is common in Kerman province - Iran, we decided to specify factors that may alter patient's responsiveness to proper treatments. This cross-sectional study was performed during 2009 and 2011 in Internal and Infectious wards of Afzalipour hospital, Kerman, Iran. 91 patients (49 male and 42 female) who had score 2 of CURB- 65 with CAP diagnosis were involved the study. Based on fever off day in patients took place during the first 48 hrs of treatment or after 48 hrs, patients were categorized in two groups and all of the parameters were compared in each group. Independent T test, Mann-Whitney and Chi-square or Fisher's exact tests were used to analyze the data. Totally 35.2% of patients were smokers, 44% were opium addicted, 60.4% of them had cough and 51.6% had fever, 56% had lung crackles on auscultation. 57.2% had abnormal WBC. 78.1% of cases who were smokers had cough and 68.8% had COPD. In the present study overall, the average duration of becoming fever off, crackle cutting and coughing interruption was 1±0. 2, 5.5±0.2 and 4.5±0.3 days respectively. Also WBC normalization took 3.8±0.2 days. The only factor with significant difference between 2 groups was the average time to relive crackles in opium addicted and non-addicted patients.

Key words: Community-Acquired Pneumonia · Crackle · Underlying Disease · Iran

INTRODUCTION

Serious community-acquired pneumonia (CAP) continues to be a major source of morbidity and mortality around the world [1]. Pneumonia is among the ten most common causes of death in all ages in the US [2]. Difficulty in making a clinical and etiologic diagnosis will increase the prevalence of antimicrobial resistance. Single antimicrobial regimen can not cover all the possible etiologies [3]. Besides clinical pneumonia symptoms, non respiratory findings are present [4]. Particular etiologic agents of pneumonia have been associated with certain underlying diseases [5]. Staphylococcal pneumonia classically has been noted during epidemics of influenza [6-8]. Certain lifestyle factors such as cigarette smoking and alcohol use have often been associated with an increased risk of pneumonia [9]. It does appear that patients with chronic obstructive pulmonary disease (COPD) have a risen occurrence of pneumonia [10]. The characteristics of the syndrome of acute CAP that was defined nearly 30 years ago are changing [11]. Most patients (58 to 89%) have one or more chronic underlying disorders [12]. Classically, CAP presents with a sudden onset of a chill following the fever, pleuritic chest pain and cough that produces mucopurulent sputum [13]. Trying to improve care in these patients requires attention to some factors including sex, age, underlying disease, addiction, chest involvement, recovery time, signs and symptoms, laboratory and radiographic findings [14]. In one study, general mortality

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due to pneumonia was 55.9% and survivors had a significantly younger age [15]. In another study, there were no statistically significant differences between treatment groups in sex, age, race and body weight [16]. A research showed us, mortality was associated with the presence of the polymicrobial infection after the initial pneumonia curing and underlying diseases [17].

The aim of this study was to find risk factors and criteria that influence treatment of CAP in patients who admitted to the hospitals.

MATERIALS AND AND METHODS

In this cross-sectional study, patients hospitalized with CAP diagnosis from March 2009 to March 2011 in the internal and infectious wards of Afzalipour hospital, Kerman - Iran who were at score 2 of CURB-65 [18] were involved the study. Demographic and clinical data such as cough, lung crackles, fever and underlying disease were recorded on the first day of study. Patients were evaluated each day during the study and all of clinical and para-clinical findings such as time of fever off, crackle and coughing off after starting treatment were recorded.

Based on fever off day in patients took place during the first 48 hr of treatment or after 48 hr, patients categorized in two groups and all of the parameters were compared in each groups.

To compare quantitative variables between two groups, independent T test was used. In the lack of normal distribution, Mann-Whitney test was used. Chi-square or Fisher's exact test was used to compare nominal variables. P value< 0.05 was considered as significant.

RESULTS

In this study, 91 cases from internal and infectious wards in Afzali-pour hospital in Kerman- Iran were involved the study. Table 1 shows demographic data,

Table 1: Demographic data and characteristics of the study population

Item		Frequency	Percent
Gender	Male	49	53.8
	Female	42	46.2
Smoking	(+)	32	35.2
	(-)	59	64.8
Opium consumption	(+)	40	44
	(-)	51	56
Chest involvement	Unilateral	49	53.8
	Bilateral	42	46.2
Coughing	(+)	55	60.4
	(-)	36	39.6
Fever	(+)	47	51.6
	(-)	44	48.4
Crackles	(+)	51	56
	(-)	40	44
WBC in blood	Abnormal	56	61.5
	Normal	35	38.5
Hypertension	(+)	40	44
	(-)	51	56
COPD	(+)	34	37.4
	(-)	57	62.6
CHF	(+)	26	28.6
	(-)	65	71.4
Diabetes mellitus	(+)	19	20.9
	(-)	72	79.1

co-morbid diseases and other medical conditions in the beginning of the study. We evaluated cigarette or opium consumption, involvement of bilateral or unilateral chest, coughing, fever, crackles in the lungs, WBC in blood, hypertension, COPD, CHF and diabetes mellitus in the patients.

Based on cutting fever, crackles, coughing and changing WBC into the normal range in correlation with variables such as gender, age, underlying disease, opium consumption and chest involvements, our patients have been divided (Table 2). However the average time of fever off according to sex in female was longer but it was not statistically significant. We found that only the time of crackles off is different among variables. It means that in patients who were addicted to opium it took more time (5.8±0.28) in comparison to non addicted (4.9±0.25) patients (P=0.024).

Table 2: Time to becoming normal in each group of patients

Variable	Becoming Fever off (day) Mean±SD	P value	Becoming Crackles off (day)	P value	Becoming coughing off (day)	P value	Becoming normal WBC (day)	P value
Gender (female)	1.15±0.28	0.424	5.6±0.326	0.639	4.44±0.5	0.911	3.9±0.36	0.65
Gender (male)	0.9±0.14		5.4±195		4.5±0.24		3.7±0.27	
Age <60 yrs	0.84±0.18	0.453	5.35±0.256	0.649	4.53±0.33	0.885	3.5±0.38	0.43
Age ≥ 60 yrs	1.08±0.21		5.53±0.240		4.44±0.36		3.9±0.26	
Underlying disease (+)	1.2±0.17	0.067	5.64±0.21	0.088	4.43±0.18	0.771	3.71±0.19	0.49
Underlying disease (-)	0.61±0.27		4.92±0.28		4.6±0.85		4.11±0.82	
Opium consumption (-)	0.9±0.26	0.474	4.95±0.25	0.024*	4.14±0.32	0.332	3.4±0.32	0.23
Opium consumption (+)	1.11±0.15		5.8±0.28		4.7±0.377		4±0.28	
Bilateral chest involvement	0.93±0.23	0.667	5.8±0.28	0.117	3.73±0.28	0.821	3.73±0.289	0.82
Unilateral chest involvement	1.06±0.2		5.21±0.22		3.84±0.33		3.84±0.33	

Table 3: Distribution of patients variables based on fever off day

| Variable | Fever off day | | |
	In the first 48hr (percent)	After 48 hr (percent)	P value
Sex	Male	22 (57.9)	4(44.4)	0.49
	Female	16(42.1)	5(55.6)	
Smoking	(-)	18(47.4)	5(55.6)	0.72
	(+)	20(52.6)	4(44.4)	
Opium consumption	(-)	13(34.2)	5(55.6)	0.27
	(+)	25(65.8)	4(44.4)	
Chest involvement	Unilateral	23(60.5)	5(55.6)	1
	Bilateral	15(39.5)	4(44.4)	
Coughing	(-)	1(2.6)	2(22.2)	0.09
	(+)	37(97.4)	7(77.8)	
Crackles	(-)	3(7.9)	2(22.2)	0.24
	(+)	35(92.1)	7(77.8)	
WBC in blood	Normal	35(92.1)	9(100)	1
	Abnormal	3(7.9)	0	
HTN	(-)	19(50)	1(11.1)	0.06
	(+)	19(50)	8(88.9)	
COPD	(-)	13(34.2)	6(66.7)	0.13
	(+)	25(65.8)	3(33.3)	
CHF	(-)	27(71.1)	6(66.7)	1
	(+)	11(28.9)	3(33.3)	
DM	(-)	25(65.8)	6(66.7)	1
	(+)	13(34.2)	3(33.3)	

After treatment of CAP, patients have been divided in two groups; fever off at first 48 hours and after 48 hrs. According to sex, patients fever off in the first 48 h in male was more than female but this was not significant (P=0.42). Percent of fever off in the first 48 h and after 48h in patients with unilateral involvement chest X-ray (CXR) was more than bilateral involvement CXR, however this difference was not significant. More results can be found in Table 3.

DISCUSSION

In this study, average time of fever and coughing off was about 1 day but in the study conducted by Johnson [19], most patients reach to normal temperature and decreasing in cough 3 to 5 days after beginning treatment. It may be related to proper use of medicine and medical care in our hospital. Johnson reported that, lung clearance was faster in nonsmokers and no differences in the rate of clearance were seen between male and female patients. Our study showed the average time of crackles off in non opium-addicted patients was faster than addict cases (P=0.024) and in male was faster than female; however this gender differences was not statistically significant. In the Johnson study, fever or leukocytosis lasting longer than 6 days after the onset of pneumonia and was more

common in patients that had delayed resolution. Elsolh *et al*. [14] study confirmed that radiographic resolution of non-tuberculosis bacterial pneumonia in the elderly should depend on lobar disorder and the burden of underlying diseases. In the other study by Klapdor [20], fever and chest pain were more common signs. In the study done in Chang Gung Memorial Hospital, general mortality was 55.9%, survivors had a significantly younger age and there were no statistically significant differences between treatment groups in terms of sex, age, race, or body weight [15]. Based on our findings there was no significant relationship in gender, opium addiction history, involvement of CXR and underlying disease with response to treatment of CAP according fever off at first 48h or after that in our study. The only risk factor that had significant difference was time of crackles off in addicted and non-addicted patients in the present study. However in the survey that Sarrafzadeh and colleagues conducted in 2008-2009 in the ICU of the other teaching hospital in Kerman [21] rate of antimicrobial resistance was high but this article shows that we have almost good condition at general and infectious wards of the hospital. The most effective technique for controlling infection in hospitals is to strategically implement Quality assurance / Quality control (QA/QC) measures to the health care sectors and evidence-based management can be a feasible

approach [22]. Also infection can be controlled by preventive measure as isolation, hand washing and gloving during the admission [23]. Due to the high costs of treating infections in hospitals following these steps must be considered. Opium has been considered as a remedy for many disorders. This belief along with use of opium as recreation can lead to addiction [24]. Opium addiction is one of the important issues of the 21st century in the world that is also imperative in Iran [25]. Data in Table 1 shows that 44% of patients who involved the study were opium addicted.

CONCLUSION

In conclusion it is important to find which factors can influence CAP treatment in each province. However smoking and opium addiction were almost usual in our evaluated patients and these factors are related to COPD we found that opium addicted patients need more time to relieve from crackle. We have to aware people about opium addiction and related health problems.

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