



Sciences clinical features of pneumonia on the background with chronic kidney disease

Davron Muminov

Department of Faculty Therapy, Military Field Therapy, Occupational Diseases, Hospital Therapy and Propaedeutics of Internal Medicine, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan

Abstract

This paper presents clinical features of pneumonia on the background with chronic kidney disease. 120 patients with acute pneumonia (AP) were examined, of which 80 patients developed the disease against a background of chronic kidney disease (group AP + CKD). The study showed that in patients with large infiltrates, occupying more than 1/3 of the lung field. In this group of patients, the hyperergic status of the immune system is noted. During therapy, the majority of patients (65%) showed positive clinical and radiological dynamics, 20 patients (16.67%) did not show significant dynamics, and 22 patients (18.22%) had clinical and radiological dynamics. Negative clinical and radiological dynamics were more often observed in the group of patients with AP + CKD ($p < 0.01$), and in this group of patients, negative dynamics was more often associated with the absence of ACC as part of complex therapy ($p < 0.001$).

Keywords: pneumonia, chronic kidney disease, acetylcysteine

1. Introduction

Acute pneumonia in modern conditions occupy a leading place among other diseases and represent both a financial and medical and social burden. As shown by epidemiological analysis, pneumonia continues to occupy the first place among infectious causes of death, steadily occupying a leading position for more than 30 years [1, 2]. The presence of kidney disease in patients with pneumonia determines the course and prognosis of the underlying disease. At the same time, patients with chronic kidney disease (CKD) have a greater risk of hospitalization for infectious diseases, including septic and fatal ones. [2,3]. Since in the pathogenesis of lung tissue damage, as well as kidney damage in acute pneumonia, one of the main roles is played by activation of lipid peroxidation, inextricably linked to the inflammatory reaction, it seems logical to use antioxidants to control the activity of inflammation. One of the promising drugs is N-acetylcysteine (ACC) - a source of glutathione and cysteine [5].

The purpose of the study

Comparative study of the clinical and radiological features of acute pneumonia in patients with initially normal renal function and background chronic kidney disease.

2. Materials and methods

The study included 120 patients with acute pneumonia. The average age of patients was 48.46 ± 3.78 years. 40 patients did not have a history of renal pathology (group AP), 80 patients suffered from chronic kidney disease (GFR for 3 months before pneumonia developed 30-60ml / min / 1.7m², group AP + CKD). As a control group (CG), 20 healthy volunteers without signs (including anamnestic) of chronic renal pathology and respiratory pathology were examined. All patients were randomly randomized into 2 therapeutic groups: patients with ACC groups (60 people) who underwent standard therapy of acute pneumonia,

Including antibiotics, expectorant drugs, bronchodilators, vitamins, patients with AC + (60 people), N-acetylcysteine (AC) was additionally included in the treatment regimen in the form of intravenous infusions at a dose of 900-1200 mg per day. The duration of therapy was 10-14 days. Upon admission, all patients underwent a complete clinical diagnostic examination. Verification of the diagnosis was carried out on the basis of chest x-ray.

3. Results and Discussion

Clinically, in patients included in the study, intoxication syndrome of various severity, cough, chest pain of a pleuritic nature was noted. Objectively recorded local amplification of voice trembling, dulling / dullness of percussion sound, auscultation - crepitus, sonorous, fine-bubbly dry rales (Table 1).

X-ray in all patients revealed one-sided limited infiltration of lung tissue with the phenomenon of "air bronchography" on the background of infiltrate. During the study, radiological signs were classified as lobar infiltrate, if the boundaries of the infiltrate were limited by the lobe, and focal drain, up to 1/3 of the pulmonary field and more than 1/3 of the pulmonary field [3]. In the AP + CKD group, focal confluent pneumonia with a large volume of infiltrate ($p < 0.001$) was significantly more common, which explains the difference in physical data. So in this group of patients, moist rales were significantly more often observed during auscultation ($p < 0.05$) and less often percussion dullness ($p < 0.01$) and palpation increased vocal trembling ($p < 0.01$). Also, in the AP + CKD group, compared with the AP group, fever above 38 degrees was less common ($p < 0.001$). This is probably due to the low activity of the immune response in connection with CKD. This is probably due to the low activity of the immune response in connection with CKD. Also, reduced immune reactivity is characteristic of focal confluent pneumonia, in contrast to the hyperergic immune response in croupous pneumonia.

Table 1: Clinical and radiological picture of acute pneumonia in patients depending on the presence of CKD

Sings	AP+CKD (n=80)	AP (n=40)	X ²
Hyperthermia	43 (53, 75%)	34 (85%)	11,50, p<0,001
Cough	80 (100%)	40 (100%)	nr
Chest pain	72 (90%)	4 (10%)	73,22, p<0,001
Voice jitter	24 (30%)	24 (60%)	9,96, p<0,01
Percussion dullness	36 (45%)	28 (70%)	6,76, p<0,01
Wet wheezing	62 (77,5%)	22 (55,0%)	6,33, p<0,05
Crepitus	80 (100%)	40 (100%)	nr
Shared infiltrate	24	28	
Focal less than 1/3	22	10	22,41, p<0,001
Focal more than 1/3	34	2	

During therapy, all patients were divided into groups of ACC + and ACC-. During the study, the dynamics of the studied parameters was evaluated in a comparative aspect. Control radiography was carried out on 10-14 days from the start of antibiotic therapy. The positive dynamics was considered to be the clarification of the infiltrate zone or a decrease in its area by 50% or more, the negative dynamics - an increase in the infiltrate zone and / or the appearance of complications — abscess formation, exudative pleurisy, and a radiological picture that did not correspond to these signs — were regarded as “without dynamics” [4].

During therapy, the majority of patients with acute pneumonia (78 out of 120 patients, 65%) have positive clinical and radiological dynamics, 20 patients (16.67%) did not have significant dynamics, and 22 patients (18.22%) have clinical and radiological the dynamics was negative - the size of the infiltrate increased, and in 9 patients (7.5%) complications were noted (2 patients - abscess formation, 7 - exudative pleurisy). In the group of AP + CKD, positive radiological and clinical dynamics were observed in 45

patients (56.25%), negative in 20 patients (25%) and without dynamics in 15 patients (18.75%).

In the AP group, this distribution was, respectively, 33 (82.5%), 5 (10%) and 2 (5%, chi square = 9.27, p <0.01, table 2). Consequently, negative clinical and radiological dynamics were more often observed in the group of patients in whom AP developed on the background of CKD (p <0.01).

The distribution by therapeutic groups revealed that among patients taking ACC, positive radiological dynamics was noted significantly more often than in patients not taking ACC (49 (81.67%) / 5 (8.33%) / 6 (10%) versus 29 (48.33%) / 17 (28.33%) / 14 (23.33%), chi square = 14.87, p <0.001). Moreover, the positive effect of ACC was expressed only in the AP + CKD group (chi square = 15.29, p <0.001), and in the AP group, the frequency differences in the radiological dynamics of the AP were unreliable (Table 2).

The distribution of patients according to the radiological characteristics of the AP into three groups did not reveal a significant difference in the frequency of various types of disease dynamics, either within each group or in the whole cohort of patients included in the study (x²= 6.89, nd).

Conclusion

Background CKD in patients with AP is associated with the development of focal confluent pneumonia with major infiltrates, a hyperergic reaction of the body. In the course of therapy, negative clinical and radiological dynamics were more often observed in the group of patients in whom AP developed against CKD (p <0.01), and in this group of patients, negative dynamics was more often associated with the absence of ACC as part of complex therapy (p <0.001).

Table 2: The distribution of patients in groups depending on the radiological dynamics of AP

Group with CKD	Therapeutic group	Characteristic of x-ray	Positive dynamics (n=78)	No dynamics (n=20)	Negative dynamics (n=22)	
AP+CKD (n=80)	ACC+ (n=40)	Drain more than 1/3 (n=17)	14	1	2	
		Drain less than 1/3 (n=12)	9	2	1	
		Lengthwise (n=11)	8	2	1	
	x ² according to the initial x-ray picture =7,80, nr					
	ACC- (n=40)	Drain more than 1/3 (n=17)	6	4	7	
		Drain less than 1/3 (n=10)	3	2	5	
Lengthwise (n=13)		5	4	4		
x ² according to the initial x-ray picture =7,85, nr						
AP+CKD, x ² ACC+/ACC- =15,29, p<0,001						
AP+CKD (n=40)	ACC+ (n=20)	Drain more than 1/3 (n=1)	1	0	0	
		Drain less than 1/3 (n=4)	3	0	1	
		Lengthwise (n=15)	14	1	0	
	x ² of the original x-ray picture = not specified, ND					
	ACC- (n=20)	Drain more than 1/3 (n=1)	1	0	0	
		Drain less than 1/3 (n=6)	5	1	0	
lengthwise (n=13)		9	3	1		
x ² of the original x-ray picture = not specified, ND						
AP, x ² ACC+/ACC- =2,07, p>0,05						
All patients, x ² ACC+/ACC- =14,87, p<0,001						
All patients, x ² AP+CKD/AP =9,27, p<0,01						
All patients (n=120)		Drain more than 1/3 (n=36)	22	5	9	
		Drain less than 1/3 (n=32)	20	5	7	
		Lengthwise (n=52)	36	10	6	
All patients, x ² according to initial x-ray picture =6,89, p>0,05						

References

1. Hansen V, Oren E, Dennis LK, Brown HE. Infectious Disease Mortality Trends in the United States, 1980-2014. *JAMA*. 2016; 316:2149–2151.
2. Jain S, Self WH, Wunderink RG, Fakhran S, Balk R, Bramley AM, *et al*. Community-Acquired Pneumonia Requiring Hospitalization among U.S. Adults *N Engl J Med*. 2015; 373:415–427.
3. Community acquired pneumonia guidelines//Infectious Disease Advisor.-January 08, 2018.
4. Quinton LJ, Mizgerd JP. Dynamics of lung defense in pneumonia: resistance, resilience, and remodeling. *Annu Rev Physiol*. 2015; 77:407–430.
5. Zhang Q, Ju Y, Ma Y, Wang T3. N-acetylcysteine improves oxidative stress and inflammatory response in patients with community acquired pneumonia: A randomized controlled trial./ *Medicine (Baltimore)*. 2018; 97(45):e13087.d