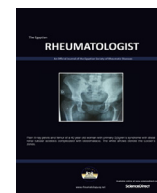




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Original Article

Analysis of clinical features and prognostic factors in Chinese patients with rheumatic diseases in an intensive care unit

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ABSTRACT

Aim of the work: To describe the clinical features and prognostic factors in patients with rheumatic diseases (RDs) admitted to the intensive care unit (ICU).**Patients and methods:** Clinical data of 33 RD patients admitted to the ICU of Shenzhen Baoan Hospital were retrospectively analyzed regarding the causes for admission, medications received, duration of stay and the management required. Disease severity of the patients was assessed using the acute physiology and chronic health evaluation (APACHE-II) score.**Results:** The diagnoses of the patients included 16 (48.5%) systemic lupus erythematosus (SLE), 7 (21.2%) systemic vasculitis, 4 (12.1%) rheumatoid arthritis; 3 (9.1%) polymyositis/dermatomyositis; 2 (6.1%) Sjögren's syndrome and 1 (3%) with systemic sclerosis. The mean APACHE-II score was mean 16.1 ± 7.3 . The main cause for ICU admission was infection in 12 (36.4%) patients, primary disease worsening in 8 (24.2%), infection associated with disease activity in 9 (27.3%) and 4 (12.1%) cases were hospitalized for other disease processes (including 1 case of subarachnoid hemorrhage, 1 case of acute myocardial infarction and 2 with hypovolemic shock). 31 (93.9%) had more than one organ involved. Mortality was 51.5% (17 cases); including 9 (27.3%) deaths from infection, 5 (15.2%) from primary diseases, and 3 (9.1%) from other causes. Primary disease worsening and APACHE-II score were significantly increased in the mortality cases (33.3% and 20 ± 7.1) compared to survivors (13.3% and 10 ± 1.2) ($p = 0.017$ and 0.0001 respectively).**Conclusion:** SLE was the most frequent cause of ICU admission; infections are the leading causes prompting admission. RDs patients often had multi-organ involvement with a high mortality rate.© 2017 Egyptian Society of Rheumatic Diseases. Publishing services provided by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Rheumatic diseases (RDs) are multisystem autoimmune diseases. Some RDs involving vital organs are life-threatening, occasionally sufficiently so to prompt intensive care unit admission (ICU). Treating critically ill RD patients remains challenging for ICU physicians and rheumatologists. It has been reported that the top 3 RDs requiring admission to ICU are: rheumatoid arthritis (RA), systemic lupus erythematosus (SLE), and systemic vasculitis (SV) [1–3].

Severe infections and sepsis are common among RA patients and are associated with increased morbidity and mortality risks

following intensive care unit (ICU) admission with sepsis [4]. Patients with RA have a higher risk for admission to the ICU than the general population and increased mortality 1 year after admission. Even with advances in management, RA remains a serious disease with significant morbidity [5].

Pulmonary disease in SLE can be extremely diverse, encompassing abnormalities such as pleuritis with pleural effusions, acute lupus pneumonitis, diffuse interstitial lung disease, pulmonary hypertension, pulmonary embolism, diaphragmatic abnormalities, atelectasis and pulmonary alveolar hemorrhage [6]. The commonest sites of infection in SLE were the skin, urinary tract and chest. It has been found that in SLE patients with infection there was a significant increase in the frequency of malar rash, photosensitivity, oral ulcers, alopecia, Raynauds phenomenon, pulmonary and neuropsychiatric manifestations compared to those without infection [7]. Latent tuberculous infection in SLE patients has been found in 15% [8]. Of the SLE patients admitted to the ICU, alveolar

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hemorrhage was the most frequent [6] and a 2.5% mortality of SLE patients in general has been reported with lupus nephritis being the most important cause of death [9].

Systemic vasculitides represent a heterogeneous group of diseases that share clinical features including respiratory distress, renal dysfunction, and neurologic disorders. These diseases may often cause life-threatening complications requiring admission to an ICU [10]. A higher initial mortality rate of ANCA-associated vasculitis (AAV) patients within the first ICU stay has been reported [11].

The aim of the present study was to describe the clinical features and prognostic factors in patients with rheumatic diseases (RDs) who were admitted to an intensive care unit (ICU).

2. Patients and methods

Clinical data of 33 RDs patients who were critically ill and admitted to our hospital (Department of Intensive Care Unit, the Affiliated Shenzhen Baoan Hospital of Southern Medical University, Shenzhen 518101, China) from July 2009 to April 2016 were retrospective analyzed regarding the causes for ICU admission, medications received within 3 months before ICU admission, duration of stay in ICU, need of mechanical ventilation and renal replacement therapy. Disease severity of the patients was assessed using the acute physiology and chronic health evaluation (APACHE-II) score, within the first 24 h of admission to ICU. The study conforms to the 1995 Helsinki declaration and approved by the local hospital ethical committee (08392). Informed consent was obtained from all patients.

The patients were classified into the following categories based on their disease causes for ICU admission: (1) infection (sepsis or positive blood culture); (2) primary disease worsening; (3) infections associated with primary disease activity and (4) other complications unrelated to the primary diseases.

Patients were diagnosed according to their corresponding classification criteria into systemic lupus erythematosus (SLE) [12], rheumatoid arthritis (RA) [13], systemic vasculitis (SV) [14], Sjögren's syndrome (SS) [15], systemic sclerosis (SSc) [16] and polymyositis/dermatomyositis (PM/DM) [17].

2.1. Statistical analysis

SPSS 16.0 software (SPSS, Chicago, IL) was used for statistical analysis in this study. Total numbers reported for each disease cause include those with multifactorial causes, and therefore are higher than the subject numbers enrolled. Comparisons between groups were performed using two sample *t*-test. Continuous normally distributed data are presented as mean \pm standard deviation. Where appropriate, data are presented as percentages and analyzed by chi-square test. $P < 0.05$ was considered statistically significant.

3. Results

The disease composition of RD patients admitted to the ICU in this study included 16 (48.5%) SLE cases (2 with secondary antiphospholipid syndrome), 7 (21.2%) SV cases including 4 with granulomatosis and polyangiitis (GPA) and 3 microscopic polyangiitis (MPA), 4 (12.1%) with RA, 3 (9.1%) with PM/DM, 2 (6.1%) had SS and 1 (3%) with SSc. The mean duration between diagnosis of RD and admission to ICU was 98 ± 80 months (1–280 months). 2 patients were diagnosed with MPA during their stay in the ICU being admitted because of acute renal failure (ARF). 23 (69.7%) patients received steroids and 13 (39.4%) received immunosuppressant within 3 months prior to ICU admission. The

diagnoses, clinical features and medications received are presented in Table 1. Reasons for RD patients admitted to ICU included infection in 12 (36.4%) cases, (Table 2).

Organ involvement of the RD patients admitted to ICU included more than one organ in 31 (93.9%) patients; 22 (66.7%) had respiratory system involvement, 9 (27.3%) with central nervous system involvement and 7 (21.2%) with renal involvement. 23 (69.7%) patients required mechanical ventilation and 6 (18.2%) required renal replacement therapy. The disease severity as presented by the APACHE-II score ranged from 6–29 (mean 16.1 ± 7.3) within the first 24 h after the admission to ICU.

Table 1

Characteristics, diagnoses, medications received and disease severity of RD patients admitted to ICU.

Parameter mean \pm SD or n(%)	RD patients in ICU (n = 33)
Age (year)	45 \pm 16.5
Female	25 (75.8)
Disease duration (month)	1–280 (98.2 ± 80.3)
Diagnosis:	
SLE	14 (42.4)
SLE/APS	2 (6.1)
RA	4 (12.1)
SS	2 (6.1)
SSc	1 (3)
PM/DM	3 (9.1)
GPA	4 (12.1)
Medications received:	
Steroids	23 (69.7)
Cyclophosphamide	4 (12.1)
Methotrexate	3 (9.1)
Azathioprine	1 (3)
Mycophenolate mofetil	5 (15.2)
APACHE-II scoring	6–29 (16.1 ± 7.3)

RD: rheumatic diseases, ICU: intensive care unit, SLE: systemic lupus erythematosus, APS: antiphospholipid syndrome, RA: rheumatoid arthritis, SS: Sjögren's syndrome, SSc: systemic sclerosis, DM/PM: dermatomyositis/ polymyositis, GPA: granulomatosis with polyangiitis, APACHE-II: acute physiology and chronic health evaluation. Medications presented were within 3 months before admission to hospital. The disease duration was considered till ICU admission.

Table 2

Reason for admission and frequency of mortality of RD patients in the ICU.

RD patients in ICU (n = 33)		
Causes for admission		Mortality (n = 17)
Infection (n = 12)		4
Lung	5	
Peritonitis	3	
Urinary tract	1	
Osteomyelitis	1	
RD worsening (n = 8)		5
Alveolar hemorrhage	3	
Pulmonary hypertension	2	
Ischemic colitis	1	
Pulmonary-renal syndrome	1	
Convulsion	1	
Infection and RD activity (n = 9)		5
Lung	5	
TB pericardial effusion	1	
Peritonitis	3	
Others (n = 4)		3
SAH	1	
Hypovolemic shock	2	
AMI	1	

RD: rheumatic diseases, ICU: intensive care unit, TB: tuberculous, SAH: subarachnoid hemorrhage, AMI: acute myocardial infarction.

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