Journal of Microbiology, Immunology and Infection (2014) 47, 345–349

Available online at www.sciencedirect.com

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ORIGINAL ARTICLE

Cytomegalovirus disease in nonimmunocompromised, human immunodeficiency virus-negative adults with chronic kidney disease

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Received 17 May 2012; received in revised form 23 September 2012; accepted 25 January 2013
Available online 6 March 2013

KEYWORDS
Chronic kidney disease;
Cytomegalovirus;
Gastrointestinal tract disease

Background/Purpose(s): To identify the clinical characteristics of cytomegalovirus (CMV) disease in chronic kidney disease (CKD) patients.
Methods: Patients from two sources were reviewed: (1) a retrospective study of hospitalized patients admitted between January 1990 and February 2009 was performed at a tertiary hospital in Taiwan; (2) the English literature from 1990 to 2009 was reviewed for additional cases, and adults with CKD and histopathologically documented cytomegalovirus disease were included.
Results: Seven CKD patients from our hospital and seven from the literature were included. Nine (64.3%) patients were males, and the mean age was 66 years. Histopathologically proven CMV disease was present in the gastrointestinal (GI) tract of 13 (92.9%) and in the skin of one (7.1%)

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http://dx.doi.org/10.1016/j.jmii.2013.01.011

patient. GI symptoms included bleeding (78.6%), abdominal pain (35.7%), and diarrhea (28.6%).The most common comorbidities were diabetes mellitus (7, 50%) and hypertension (8, 57.1%). Thirteen patients had CMV GI disease. The endoscopic gross features of the GI tract lesions included single or multiple ulcers and a large polypoid or uneven surface mass. Of the seven cases with available data, a low body mass index (22.3 ± 1.3 kg/m^2) and hypoalbuminemia (25 ± 7.0 g/L) were noted. Twelve patients had received ganciclovir or valganciclovir therapy. Five (35.7%) patients died, and the death of two patients was directly related to bowel perforation caused by CMV colitis.

Conclusion: CMV disease may occur in CKD patients without the presence of overt immunodeficiency. The gastrointestinal tract is the most common site of involvement. Clinicians should be aware of this possibility in CKD patients who have GI symptoms.

Introduction

Cytomegalovirus (CMV) infections are common and worldwide. The seroprevalence rate of cytomegalovirus infections in adults was approximately 40—100% of the general population.[1] In immunocompromised individuals, such as those with human immunodeficiency virus (HIV) infection or transplant recipients, CMV can cause a broad spectrum of diseases, including meningoencephalitis, pneumonitis, hepatitis, retinitis and gastrointestinal (GI) ulcerations, and is associated with significant morbidity and mortality.[2,3] Although CMV infection is common in immunocompetent adults, most infected adults show no symptoms or occasionally show self-limited infectious mononucleosis, which warrants no antiviral treatment.[4]

The prevalence of chronic kidney disease (CKD) in the general population has been increasing in recent years.[5,6] Data from the Department of Health in Taiwan indicates that the prevalence of end-stage renal disease was 384/million population in 1990 and increased to 1630/million population in 2003.[7] This prevalence and incidence of CKD in Taiwan is relatively high compared with other countries.[5,7] end-stage renal disease patients may have a higher risk of encountering CMV because of frequent blood transfusion and contaminated dialysis equipment when receiving hemodialysis.[8] Despite reports of high seroprevalence of CMV infection in CKD patients (66—84%), CMV disease in this population has rarely been reported.[9,10] The aim of the present study is to determine the clinical presentation, laboratory findings, and associated comorbidities of CMV disease in CKD patients.

Materials and methods

Study patients were obtained from two sources. First, a retrospective study was performed at the National Cheng-Kung University Hospital, a medical center in southern Taiwan. Using the keyword "cytomegalovirus", the discharge database of patients admitted between January 1990 and February 2009 was searched. The inclusion criteria were as follows: adults (minimum age 18 years) with CKD, defined as an estimated glomerular filtration rate of <60 mL/min/1.73 m^2 for at least 3 months, irrespective of the cause,[8] and clinical presentations that were compatible with active CMV disease, as evidenced by either large viral inclusion bodies or positive findings of CMV immunostaining on histological studies of the biopsied tissues or resected sites. Immunocompromised patients, including those with HIV infections, congenital or acquired immunodeficiency syndrome, histories of allogeneic transplantation, malignancy, or the receipt of immunosuppressive therapy, were excluded. The medical records of patients with CKD and CMV disease were reviewed for the demographic information, underlying diseases, laboratory data, image findings, clinical courses, and outcomes. The body mass index (BMI) is defined as the body weight divided by the height^2.

The second source of patients we reviewed was from a literature search (1990—2009, computerized PubMed database). The keywords used were "cytomegalovirus" and "renal failure", "renal insufficiency", or "chronic kidney disease". The inclusion and exclusion criteria were the same as those described in the case selection from our hospital. The clinical information of the case reports and detailed descriptions were extracted from the publications.

Results

Overall, 166 adults were clinically diagnosed as having CMV infections at the study hospital between January 1990 and February 2009. A total of 110 immunocompromised patients were excluded, including 74 patients with organ transplantation and immunosuppressive therapy, 30 with HIV infection, and six with malignancy and chemotherapy within the past month. Of the 56 immunocompetent patients with CMV infection, only 11 had histologically documented CMV disease. Seven of these 11 patients had CKD and were included in the study. An additional seven patients with nonimmunocompromised CKD and active CMV disease were identified in the English literature and eligible for this analysis (Table 1).[9—13]

The clinical characteristics of the 14 patients with CKD and active CMV infection are summarized in Tables 1 and 2. Nine (64.3%) patients were males. The mean $\pm$ standard deviation age was 66.1 ± 9.9 years, with 8 (57.1%) patients older than 70 years. Nine (64.3%) patients had been receiving regular hemodialysis. Other than CKD, the common comorbidities were hypertension (8, 57.1%) and diabetes mellitus (7, 50.0%). Complete blood cell counts were available for 10 patients who presented with CMV disease. Mild leukocytosis (mean 11.56×10^9 cells/L) and anemia (mean hemoglobin concentration 92 g/L) were noted.