Author’s response to reviews

Title: Relevant pericardial effusion caused by cytomegalovirus infection in an immunocompetent patient: a case study

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Dear colleges,

According with the proposal for reviewing, we have developed those points that were of importance for the optimization of the presentation of the case.

First of all, we have conducted a grammatical revision with an independent translation company.

As you can see below, all changes that we considered important for answering all those questions are presented. In the introduction (background) we add a paragraph to explain the reason because we would like to publish this case.

In the case presentation we completed the information related to past medical history, examinations and tests conducted during her stay in the hospital. Since her urine analysis was irrelevant, we didn't give this information. There was a laboratory control a year after admission for other reasons and was normal, but the doctor in charge didn’t control CMV evolution by lack of indication.

In the discussion we make another introduction summarizing our case in order to compare to the literature.

Finally, we agree with the reviewer that CMV is absolutely not the first diagnosis option, but we think that the presentation of the case shows the diagnostic process until the result. However, we consider of importance this unexpected result in the sense of a more specific diagnostic approach.
Thank you for your patient and we are open for new proposals.

Marcos Delgado

Background

Cytomegalovirus (CMV) infection in immunocompromised patients is known to cause symptomatic disease. In immunocompetent patients, a CMV infection usually proceeds without symptoms or provokes symptoms resembling infectious mononucleosis. However, several reports which consider a more severe clinical course of disease in otherwise healthy people have been published [1-3]. We report the case of a healthy immunocompetent woman who presented in our hospital with haemodynamically relevant pericardial effusion caused by an acute CMV reinfection showing new IgM seroconversion. This case emphasises the fact that a CMV infection or reinfection, must be considered as a cause of a pericardial effusion in immunocompetent individuals.

Case presentation

Anamnesis

A 72-year-old female patient presented at her general practitioner complaining that she had been suffering from progressive shoulder pain for two weeks and dyspnea on exertion for one week. The patient’s past medical history included a case of arterial hypertension, treated with Cilazapril and Atenolol/Chlorthalidone, as well as dyslipidaemia, treated with Atorvastatin. The patient has been smoking about 5 cigarettes each day for the last 30 years but she does not consume alcohol on a daily basis. The patient is retired and lives with her husband. They have 2 children and 3 grandchildren. In the initial examination carried out by her general practitioner, a blood sample was taken and a chest x-ray was carried out, showing elevated inflammation parameters and a large unilateral pleural effusion. As the patient’s general condition deteriorated she was admitted to the hospital.

Investigations

Upon admission to the hospital the patient was afebrile (temperature 37.3°C). The patient’s blood pressure was 91/59 mmHg and she had a heart rate of 82 beats/min (given that she was undergoing treatment with Atenolol). A 2/6 systolic heart murmur was evident from her clinical examination. There was no visible engorgement of the neck veins, nor signs of lower leg
oedema. Her breath sounds were attenuated on the left side and her neurologic examination was normal.

Her blood results showed elevated C-reactive protein (CRP upon admission 256.7 mg/l; reference <7.5 mg/l) and leucocytosis (leucocytes upon admission 21.5 $10^9$/l, reference 3.5-10.0 $10^9$/l) with slight monocytosis present in the leukogram. Additionally, she showed elevated levels of aspartate amino transferase (ASAT) and alanine amino transferase (ALAT) as well as alkaline phosphatase and gamma-glutamyltransferase (GGT), whilst her bilirubin levels were within the normal range. She presented with slightly impaired renal function upon admission but this was normalized after hydration. The aspiration of the pleural effusion revealed exudate without signs of a bacterial infection (cell number 4 $10^9$/l, out of which 85.5% were polynuclear cells and 13.5% were mononuclear cells; pH 7.57, glucose 7.5 mmol/l, Protein 39 g/l, LDH 213 U/l; no growth of microorganisms). A transthoracic echocardiography revealed pericardial effusion with consecutive hemodynamic changes but no pericardial tamponade. The left ventricle was normal in shape with normal systolic function (left ventricular ejection fraction 60%), but there was evidence of dysfunctional relaxation. The heart valves were normal. The right ventricle was normal in shape and function (figure 1 and 2).

A CT scan showed dilatation of the inferior vena cava and of the liver veins, as well as a hepatomegaly, resulting either from venous congestion or from an inflammatory process.

Several additional blood tests were done in order to rule out a rheumatologic aetiology: rheumatoid factor, anti-citrullinated protein antibody, anti-nuclear antibody, anti-neutrophil cytoplasmic antibody, dsDNA, anti-Sm antibody, anti-mitochondrial antibody and complements C3 and C4. The results of all of these tests were normal. To determine a possible infectious cause, serologic testing was performed for hepatitis B and C, human immunodeficiency virus (HIV), Borrelia burgdorferi, Epstein-Barr virus, CMV, chlamydia, enterovirus and mycoplasma. The results showed an acute CMV reinfection.

Discussion

We report about the case of an otherwise healthy, immunocompetent patient, who suffered severe complications from an acute CMV reinfection. In immunocompetent patients, a CMV infection usually provokes symptoms resembling an infectious mononucleosis or does not cause any symptoms at all. However, a few reports have been published about severe complications, as in our case.

Cytomegalovirus belongs to the herpes viruses’ family and has a linear, double-stranded DNA [4]. The ......