Case Report

Case-report: A three- month-old girl with CMV pneumonia and urolithiasis

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Abstract

Childhood urolithiasis remains endemic in certain parts of the world, namely, Turkey and the Far East. There has been huge effort in the literature towards clarifying the etiology of the disease, but still there is considerably high percentage of cases classified as idiopathic. This remains an issue to be solved. Considering that urolithiasis is more common among lower socio-economical level, further risk factors among this group should be discussed. Cytomegalovirus (CMV) is the most common congenital infection in humans and an important cause of morbidity and mortality. CMV causes focal necrosis with minimal inflammation in virtually any organ and might also cause renal tubulitis. In this article we reported a case of three months' old girl who was hospitalized for pneumonia and found to be CMV seropositive and incidentally found to have bilateral urolithiasis. We discuss that CMV infections might play a role in the etiology of urolithiasis.

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Introduction

In some areas of the world, such as Turkey and the Far East, childhood urolithiasis used to be endemic (1, 2, 5, 18); in boys especially it accounted for a significant proportion of children admitted to hospital. The evidence implicates dietary factors in their pathogenesis, particularly dependence on a cereal or rice diet. Such stones declined in incidence this century, probably as a consequence of improved standards of nutrition as has also happened in Turkey (2, 18).

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Cytomegalovirus (CMV) is the most common congenital infection in humans and an important cause of morbidity and mortality in immunocompromised hosts (14). CMV causes focal necrosis with minimal inflammation in virtually any organ. Cytomegalic inclusions are present in both endothelial and epithelial cells and are most abundant in the renal tubular epithelium, hepatocytes, and lining cells of portal bile ducts. CMV might cause renal tubulitis (15, 16).

In this article we reported a case of three months' old girl who was hospitalized for pneumonia and found to be CMV seropositive and incidentally found to have bilateral urolithiasis. We discuss that CMV infections might play a role in the etiology of urolithiasis.

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Case

A three months' old girl admitted to the emergency department with complaints of cough, fever, wheezing and abdominal distention. She had cough and wheezing since birth and fever was

added to her symptoms a few days before admission.

In her physical examination all her percentiles were below three. Her chest examination revealed bilateral ralls and ronchi.

Her Hemoglobin level was 10,2 gr/dL, Htc 30%, WBC 8800/ml and ESR 20hr/ml. Peripheral blood showed 80 % lymphocytes. Her renal and liver function tests and electrolytes were normal. Immunoglobulins and complements were in normal limits for her age. CMV IgM levels were found to be high. Her urine microscopy was normal. Posteroanterior chest x-ray showed bilateral paracardiac infiltration.

Abdominal ultrasonography revealed grade 1 increased left parenchymal echogenity, grade 1 hydronephrosis in left kidney and 6 mm stone echogenity in lower collecting system. Right kidney pelvicaliceal system was normal. 3 mm stone and a few milimetric crystalloids were seen in right kidney lower collecting system. These ultrasonography results were also confirmed by abdominal CT.

Ganciklovir therapy was started with the diagnosis of CMV pneumonia. Regarding the etiology of urolithiasis no underlying metabolic disease or anatomic abnormality was found.

By completion of Ganciklovir therapy to 21 days she was well enough to be discharged.

Discussion

Childhood urolithiasis remains endemic in certain parts of the world, namely, Turkey and the Far East (1, 2, 5, 18). The incidence of urolithiasis in children in the United States ranges between 1 in 1,000 and 1 in 7,600 hospital admissions (7, 8). While the frequency of childhood urolithiasis is steadily decreasing in the developing countries, it is still endemic in some parts of the world. Turkey is one of the endemic countries, but there is no sufficient documentation of recent characteristics of the disease in Turkish children(2,5,18). It is still one of the most common pediatric urologic problems in Turkey, but as living standards improve, the incidence of the disease has tended to decline in recent years (5, 9).

Malnutrition and lower socioeconomic homes are very well known factors in the etiology of urolithiasis (6); and our case comes from a lower socioeconomic home, with malnutrition having all her percentiles below three. Anatomic anomalies and metabolic disorders are of great importance in the etiology and a great percentage has been classified as infective (3, 4, 5). Although there has been many studies regarding etiological factors, there is still a considerably high percentage which is classified as idiopathic. In one study in the UK 26 percent of the cases was classified as idiopathic (4), whereas this is reported as 7.4% in a study in Iraq (3). In Turkey as etiological factors, an anatomical defect was found in 30.4% of the patients, infections in 31.5%, and metabolic disorders in 26.1%; 12.0% was classified as idiopathic (2). No underlying anatomic, infective or metabolic cause could be found for our three-month-old case and was classified as idiopathic.

Cytomegalovirus (CMV) is the most common congenital infection in humans and an important cause of morbidity and mortality in immunocompromised hosts (14).

CMV, however, can also cause devastating systemic infections in neonates and in immuno-suppressed patients (15,16). CMV is very prevalent in Turkey and is at the higher end of worldwide ranges. Most CMV infections in the first year of life are transmitted from mother to infant and this is the main source of infection in Turkey (10).

CMV causes esophagitis, colitis, hepatitis, pneumonitis, renal tubulitis, chorioretinitis and meningoencephalitis. The lesions caused by disseminated CMV infections in the newborn and immunosuppressed patients are similar. CMV causes focal necrosis with minimal inflammation in virtually any organ but most often in the salivary glands, kidneys, liver, lungs, gut, pancreas, thyroid, adrenals and brain. Cytomegalic inclusions are present in both endothelial and epithelial cells and are most abundant in the renal tubular epithelium, hepatocytes, and lining cells of portal bile ducts (15, 16).

Our case of urolithiasis, being a female in the first months of life, is a rare case. She was hospitalized for pneumonia, found to be CMV seropositive and was also diagnosed as urolithiasis. Coming from a lower socioeconomical status and having malnutrition are among the risk factors for urolithiasis (6). For our case no underlying disease could be found and the etiology of her urolithiasis was classified as idiopathic. In a case in Poland a 15-year old girl, with biopsy proven interstitial nephritis, who presented with a slight impairment of kidney function and symptoms of tubulopathy at the beginning of the illness, was detected as CMV seropositive. Kidney biopsy revealed IN and positive reaction to CMV antigen in tubular epithelial cells. It was discussed that CMV infection should be mentioned among the rare causes of IN (17). Similarly we discuss that CMV might be a rare cause of urolithiasis. Both CMV infections and urolithiasis are common in lower socioeconomical groups with malnutrition (6, 14).

Each year in the United States, an estimated 40,000 children are born with congenital cytomegalovirus (CMV) infection, causing an estimated 400 deaths and leaving approximately 8000 children with permanent disabilities such as hearing or vision loss, or mental retardation (12). In a study in Portugal it was shown that in most cases of hearing loss secondary to congenital CMV infection, the newborn was asymptomatic (13). CMV

is asymptomatic in 99% of cases. It is especially dangerous for neonates, in whom heavy cytomegalovirus disease is connected with immaturity of the immunological system, and for people with immunological system disorders (after transplantations or HIV infections) (11). So in some cases of urolithiasis that is classified as idiopathic, the patient might be in the process of asymptomatic CMV infection and might not have been checked for the serology of CMV antibodies.

Pediatric urolithiasis is a rare condition with a considerably high percentage of idiopathic cases and this still remains an important issue to be solved. The cases diagnosed for urolithiasis in endemic areas, where CMV is also endemic, should be checked for CMV seropositivity to enlighten the etiology of the disease.

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