Um caso de oligomeganefronia de início tardio

A case of late-onset oligomeganephronia

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Resumo

Paciente do sexo masculino, 33 anos de idade, foi investigado por apresentar um quadro de dor abdominal em flanco direito, proteinúria, hematúria e níveis elevados de creatinina sérica. A ultrassonografia evidenciou rins de tamanhos assimétricos, e a biópsia renal confirmou o diagnóstico de oligomeganefronia (OMN). OMN é uma forma muito rara de hipoplasia renal, e ainda mais infrequente na faixa etária adulta. Na população pediátrica, OMN culmina com insuficiência renal terminal em poucos anos. Este é o sexto caso de oligomeganefronia de início tardio relatado na literatura, que ainda não teve evolução para insuficiência renal crônica.

Palavras-chave: anormalidades congênitas, insuficiência renal crônica, proteinúria.

Abstract

A 33-year old caucasian man was investigated for pain in the right flank, proteinuria, hemathuria and an elevated serum creatinine level. He also presented an abnormal ultrasonography, which revealed asymmetric kidneys. Through renal biopsy, the diagnosis of oligomeganephronia (OMN) was confirmed. OMN is a very rare form of renal hypoplasia, and late-onset in adulthood is even rarer. In the pediatric population, OMN leads to end-stage-renal-failure(ESRF) in a few years. This is the sixth case related in the literature of a late-onset OMN who have not yet developed ESRF.

Keywords: congenital abnormalities, kidney failure, chronic, proteinuria.

Introduction

In 1962, Habib *et al.* described renal pathology findings of a particular form of renal hypoplasia, which was eventually called (congenital) oligomeganephronia (OMN).[1]

Oligomeganephronia is a type of renal hypoplasia characterized by a severe developmental defect in both kidneys and the following histopathologic features: low number of nephrons, hypertrophic glomeruli and hypertrophic tubules.[1]About 30% of the children affected by this unusual pediatric illness are either premature newborns or small to their gestational age, with a clear male preponderance (male: female ratio ~3:1).[1] All affected children develop progressive renal failure leading to end-stage renal disease within months after birth or until early-mild adolescence.

There are many cases of the oligomeganephronic condition in childhood reported in the medical literature, but few cases of this condition developing as a late-onset in adults. Therefore, we report a case of late-onset oligomeganephronia in a patient who still has not developed end-stage renal disease.

Case report

A 33-year-old caucasian male from Rio Grande (Rio Grande do Sul state - Brazil) contacted the emergency medical service complaining about pain in his right flank. He did not complain about nausea, vomiting, fever or asthenia. During physical examination, the patient was in a good general state, had stable vital signs, non-altered heart and lung auscultation and

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light pain as deep palpation was done in his abdomen. He had no medical or relevant family record. He did not mention smoking or alcohol intake. After being medicated to pain, he was referred to the assistant doctor.

After having the algic state, the patient brought to the assistant doctor some laboratory exams showing creatinine level at 1.95 mg/dl (normal 0.7-1.4 mg/dl) and urinalysis with density of 1020, ph 6.0, proteins +++/4, hemoglobin ++++/4, 5 erythrocyte per field and 4 leukocytes per field. The patient did not have any complaints or alterations in the physical examination. Fifteen days later, the patient presented to the doctor new laboratory exams showing creatinine level at 2.09 mg/dl; creatinine clearance level at 50.7 ml/min; proteinuria (24-h urine) 2.908 mg; hemoglobin 15.8 g/dl; hematocrit 47%; LDL 125 mg/dl; triglycerides 271 mg/dl; total cholesterol 224 mg/dl and blood glucose 94 mg/dl.

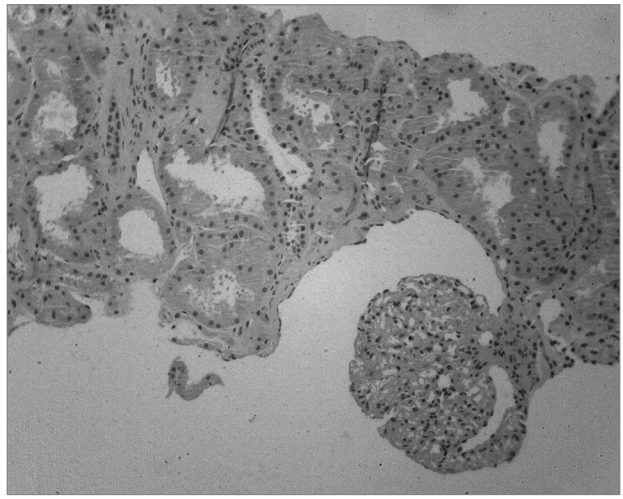
Serum creatinine level was elevated at 2.01 mg/dl and creatinine clearance was decreased (47 ml/min/1.73 m²).A 24-h urine collection revealed 3.355 mg of protein. Serum complement levels were almost normal: C3 was 167 mg/dl (normal 79-152 mg/dl), C4 was 37.2 mg/dl (normal 16-38 mg/dl) and CH50 was 151 U/ml (normal 170-330 U/ml). Anti-nuclear antibodies (ANF, Anti-Sm and Anti-DNA) were negative. On ultrasonography, his urinary tract showed simple bilateral cysts and a decrease of the size of the right kidney (7.2 cm) in relation to the left kidney (10.2 cm). There were no signs of obstructive uropathy.

A percutaneous renal biopsy was performed to establish a diagnosis. On microscopy, the specimen containing four glomeruli showed a global volume enlargement. No segmental sclerosed or proliferative lesions were identified. The tubules were dilated covered with hyperplasic epithelial cells. Immunofluorescence was positive for IgM and negative for IgG, IgA, C1q, C4, C3c, fibrinogen, kappa and lambda. These findings lead us to the diagnosis of oligomeganephronia.

Discussion

Oligomeganephronia (OMN) is a congenital anomaly of bilateral renal hypoplasia, histopathologically featuring a reduction in the number of nephrons and markedly enlarged glomeruli (Figure 1), so the final diagnosis of OMN was made on the basis of renal pathologic findings.[2]

Figure 1. Oligomeganephronia - Renal biopsy showing glomerulus whith enlarged and hypertrophic tubules. Hematoxylin and eosin stain (100X).



In most cases, oligomeganephronia begins with polydipsia and polyuria in early childhood, which is followed by an end-stage renal disease by school age. In some cases, asymptomatic proteinuria demands closer examination, including kidney biopsy, leading to the diagnosis of oligomeganephronia by school age (late-onset type).[2] This disorder is very rare in the pediatric population and even rarer in adult patients. Kawanishi *et al.*[3] reported, for the first time, three adult oligomeganephronia patients who had atrophic kidneys on ultrasonography and had not developed end-stage renal disease. The first case was of a 36-year-old male who exhibited hypertension, proteinuria and a serum creatinine level at 2.65 mg/dL. The second case was of a 19-year-old female, with proteinuria (+) and occult blood in urinalysis screening. The third was a case of 21-year-old male, whose proteinuria was detected through urinalysis screening when he was 15 years old. The last two patients did not present hypertension.

The case presented in this article is different from the others for two reasons. First, our 33-year-old male patient exhibited heavy proteinuria (3.3 g). Second, our case had asymmetric kidneys, situation found when associated with unilateral agenesis, which was not the situation. The present case is similar with the first case of Kawanishi and colleagues in relation to the sex, age and serum creatinine level. The other two cases of the same author revealed almost normal levels of serum creatinine, and the unique sign seen in all of the four commented cases of oligomeganephronia was the proteinuria. Fuke *et al.* reported

the fourth case of OMN in the scientific literature.[2] They investigated a 23 year-old man who had hypertension, moderate renal insufficiency, persistent proteinuria and bilateral small kidneys. Similarly to our case, their patient still had not advanced to end-stage renal failure too.

In regard to the etiology, which is not yet clearly known, there are some hypotheses: the first of them is that the inadequate embryonic development of the metanephric blastema during the 14-20-week period interferes with the formation of the nephron; other related suppositions are placental shunts, intravascular coagulation, low birth weight and intrauterine growth retardation. There are also cases due to genetic disorders, like 4p monosomy, PAX-2 gene mutations and hepatocyte nuclear factor - 1 (HNF-1) mutations carriers.[3] Independently of the etiology, fewer nephrons with subsequent hyperfiltration and glomerulosclerosis lead to accelerated ageing and early loss of renal function till end-stage renal disease.[3] This is the so-called hyperfiltration theory of renal damage, which is based on the notion that the few remaining hard-working nephrons will eventually fail, resulting in progressive glomerulosclerosis.[1]

In order to understand better the pathophysiology of oligomeganephronic disease, some studies in rats with hypoplastic kidney have served as a useful model to study the theory of glomerular hyperfiltration and hypertrophy induced by reduction of nephrons.[4]

In conclusion, although recent studies suggest that genetic factors are involved in the occurrence of some cases of oligomeganephronia, the etiology remains undetermined[4]. Moreover, the majority have a similar degree of nephron reduction, albeit the changes in renal function vary from patient to patient.

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