



Challenges in the Diagnosis and Management of Nephrotic Syndrome in a Child With Multisystemic Tuberculosis

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Abstract

We report the case of a child who had tuberculosis associated with nephrotic syndrome. In this case, it was difficult to identify if the renal involvement was due to renal infection with mycobacterium tuberculosis, the consequence of nephrotoxicity of anti-bacillary drugs, or due to new onset of nephrosis. Management was complex as the use of high-dose steroids can disseminate the infection.

Keywords

renal tuberculosis, nephrotic syndrome, granulomatous interstitial nephritis, child

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Introduction

Tuberculosis is still endemic in Morocco, with 30 000 new cases every year; one-third of them are children under 15 years old.¹ The prevalence and management of renal involvement in this pediatric population are not evident. Also, no recommendations are available on how to treat nephrotic syndrome in these patients. In this article, we present the case of a child treated for lymph node tuberculosis who developed a nephrotic syndrome 15 days after starting tuberculosis therapy.

Case Presentation

An 8-year-old boy was referred to our center for etiological assessment of persisting cervical lymphadenopathy for more than 1 month with no past medical history. No member of his family or entourage was treated for tuberculosis or cancer. The boy received his BCG vaccination at 3-week-old. At presentation, he appeared well, with no prolonged fever, weight loss, or anorexia. He had average growth for his age (with a weight of 26 kg (SD=0), a height of 130 cm (SD=0), and a BMI of 15.4 (SD=0)). A unique right cervical lymph node (length of 3 cm, width of 2 cm) was found. The adenopathy was soft, not inflammatory, painless, and easily

movable. There was no hepatosplenomegaly or other abdominal mass, and the rest of the physical examination was unremarkable. Laboratory workup found a normal CBC (WBC of 8765/mm³, Hb of 12.3 g/dl, platelets of 154 000/mm³), as well as a negative CRP (of 0.5 mg/l) and ESR (of 5 mm the first hour). An excisional biopsy was performed and found an epithelioid cell granuloma with caseating necrosis. PCR of the biopsy was negative to mycobacterium tuberculosis DNA.

Meanwhile, the IGRA test was positive. After that, the diagnosis of lymph node tuberculosis was confirmed. Chest radiograph and abdominal echography were performed to rule out other organ involvement and proved normal. Microscopy, culture, as well as PCR found no mycobacteria in 3 consecutive daily expectorations. Treatment consisted of anti-bacillary therapy, according to the Moroccan ministry of health recommendations for

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the management of lymph node tuberculosis of children (2RHZE/4RH regimen). Evolution was marked by sub-acute onset of generalized edema by the second week of treatment. Laboratory workup found massive proteinuria of 1.35 g/m²/24h, hypoalbuminemia of 9 g/l, and hypoproteinemia of 43 g/l, defining a nephrotic syndrome. He had no gross or microhematuria on urine analysis. The renal function was normal (urea nitrogen of 0.24 g/l, creatinine of 3 mg/l, and GFR of 179 ml/min/1.73 m²). Renal ultrasonography demonstrated 2 averagely sized kidneys with good corticomedullary differentiation. Microscopy, culture as well as PCR found no Mycobacteria in urine. Symptomatic measures consisted of perfusion of albumin by slow IV route at a dose of 1 g/kg/day, with concomitant furosemide boluses till resolution of edema. It was necessary to define the etiology of his new condition: is it nephrological tuberculosis, drug toxicity (especially rifampicin and isoniazid), glomerulonephritis, or idiopathic nephrotic syndrome? In this perspective, we performed a renal biopsy puncture that revealed granulomatous interstitial nephritis with subnormal glomerulus and without crescents, fibrosis, or immune complex deposition. The diagnosis of renal tuberculosis was most likely. The management consisted of carrying out the anti-bacillary treatment (2RHZE/7RH regimen) alone for 6 weeks. By that time, proteinuria was still massive, of 1.45 g/m²/24h, which is why high dose oral steroids were prescribed (2 mg/kg/day of prednisone for 4 weeks). After that, evolution was marked by persistent massive proteinuria of 2.05 g/m²/24h. To rule out steroid resistance, the child received 3 pulses of 1 g/1.73 m² of methylprednisolone every 2 days while maintaining oral steroids in between and after the pulses. The resolution of proteinuria (<100 mg/m²/24h) was obtained 2 weeks after the last pulse, after which tapering of prednisone was started. Withdrawal of steroids was possible by the sixth month of onset. Meanwhile, anti-bacillary drugs were maintained for a total period of 9 months. No relapse of proteinuria nor tuberculosis was seen after a total follow-up of 12 months.

Discussion and Conclusion

Renal tuberculosis, a subset of genitourinary tuberculosis, accounts for 15% to 20% of extra-pulmonary tuberculosis, and renal involvement may occur by a direct kidney infection or through secondary amyloidosis.² Renal tuberculosis can result in varied clinical symptoms. Nephrotic syndrome is an uncommon manifestation but can occur when there has been glomerular damage.² The principal means of diagnosing renal tuberculosis is isolating mycobacterium tuberculosis from urine or biopsy specimens.³ Granulomatous interstitial

nephritis is an entity rarely detected in renal tuberculosis.⁴ In general, renal tuberculosis is treated with a standard 6-month regimen.³ In the case of granulomatous interstitial nephritis, retrospective data and clinical experience suggest that anti-bacillary drugs in conjunction with corticosteroid therapy often improve renal function.⁴ However, inducing remission in nephrotic children on anti-tubercular therapy can be difficult due to the increased metabolism of prednisolone induced by rifampicin.⁵ Sometimes withdrawal of antituberculosis therapy or rifampicin alone can be necessary.⁵ In our case, the use of methylprednisolone pulses was efficient, and remission was obtained shortly afterward.

In summary, granulomatous interstitial nephritis associated with nephrotic syndrome can complicate renal tuberculosis in children. High-dose steroids seem to be safe and efficient in inducing remission. However, more trials are necessary to determine the exact dose of steroids and the total length of anti-bacillary therapy. Meanwhile, rifampicin toxicity can be difficult to rule out.

Author Contributions

HN: writing the paper. RQ, AB, IA: revision and final approval.

Declaration of Conflicting Interests

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Statement of Ethics

The parents have given their written informed consent to publish their child's case. Ethics approval was not required by the ethics committee of Mohammed VI university hospital center of Marrakesh.

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Data Availability Statement

All data analyzed during this study are included in this article. Further enquiries can be directed to the corresponding author.

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