



The Corner

M. Sánchez Martín*, M. Gómez de Pablos Romero**
*Adjunto de Pediatría del Hospital Universitario La Paz,
**Adjunto de Pediatría de la Clínica Universidad
de Navarra (Pamplona)

39. Resident-attending in the ED: Proteinuria

Resident: María Sánchez Martín. Adjunto de Pediatría del Hospital Universitario La Paz. Madrid

Attending/Mother: Mónica Gómez de Pablos Romero. Adjunto de Pediatría de la Clínica Universidad de Navarra. Pamplona

Resident: Good morning Dr. Keen. Could I tell you about a patient I just saw?

Attending: Of course, Alice.

Resident: It's a 3-year-old Philippine boy with a general swelling of the body for 4 days. The swelling started abruptly with periorbital and face puffiness, followed by swelling of the lower limbs. His mother says he doesn't complain of pain, but he is fussy, has lost his appetite and his urine output has slightly decreased in the last couple of days, but without hematuria or any other abnormal characteristics to the eye. He doesn't have fever or any other symptoms and he hasn't been ill recently; his last cold was 3 weeks ago. He doesn't have any significant medical or family history either and his vaccinations are up to date.

Attending: What are his vital signs? What about the physical examination?

Resident: His HR is 118 bpm, RR 26 bpm, BP 91/62 mmHg, capillary refill time 2s and temperature 36.5°C. He has a generalised pitting edema, painless to palpation and the overlying skin is completely normal. He doesn't have trouble breathing and his cardiopulmonary auscultation is normal. The abdomen is distended, but depressible and not tender to palpation, without organomegalies. He doesn't show lymph node enlargement.

Attending: According to the anamnesis and physical examination, what do you suspect?

Resident: I believe it could be a case of nephrotic syndrome. It is more prevalent in boys aged 2-6 years old, especially from South East Asia. The generalised edema without hypertension or gross hematuria or any other significant symptoms is characteristic. Given that he hasn't had any recent infection and his geographical origin, I would guess it may be idiopathic, which is the most common, but we'll have to confirm the diagnosis and see how he responds to immunosuppressive treatment.

Attending: I agree with you, Alice. Therefore, we should check his blood and urine labs.

Resident: Yes, I'll order them right away and explain it to his mother.

Attending: Great, come to me with the results. Don't forget to place an IV line, but don't start him on IV fluids just yet. Remember that these patients have a marked increase in total body water secondary to hypoalbuminemia, which is caused by massive urinary protein loss due to increased permeability across the glomerular filtration membrane. They can also have sodium and water retention produced by ADH secretion. Apart from the slight decrease in urine output referred by his mother, he doesn't show any other clinical signs of intravascular volume depletion.

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Resident: Dr. Keen, I have the main lab results. He has proteinuria of +4 and urinary protein creatinine ratio of 3.6 mg/mg with microscopic haematuria of 2/HPF, hypoalbuminemia of 2 g/dl, hyperlipidemia with total serum cholesterol of 410 mg/dl and mild hyponatremia of 131 mmol/L. The CBC is normal with platelets in the upper limit and the renal function is also normal. The etiological study is pending results.

Attending: OK, so it does seem the little boy has nephrotic syndrome. What would be the treatment then?

Resident: He will have to be admitted to the hospital and started on steroid therapy and salt and fluid intake restriction. A careful water balance is imperative and we should avoid IV fluids or immobilisation.

Attending: That's right. Start him on prednisone 60 mg/m²/day, single morning dose and restrict his fluid intake to 400 ml/m²/day of insensible fluid losses plus his urine output. Order a well-balanced high-protein and low-salt diet. Would you say a renal biopsy is necessary?

Resident: No, not for now. He has a typical age of debut, normal serum creatinine, and absence of macroscopic haematuria and hypertension, so we don't need it for the diagnosis or management. Its indication will depend on the complement values and the response to corticosteroids, though.

Attending: Very well. Please inform his mother while I call the nephrologist and take care of the admission.

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Resident: Hello. Your son's results are back. He has nephrotic syndrome. This is a kidney disease characterised by large urinary losses of protein, which produce swelling. In his case, we believe it is idiopathic, which means that the specific cause is unknown, although it seems that underlying immune disturbances and other molecular mechanisms may be involved. He will have to be admitted to the hospital for initial treatment, which he will then continue at home, monitoring

and additional tests. He should recover from this episode within the first week of therapy.

Mother: Thank you for the information, doctor. Does that mean it can happen again?

Resident: Unfortunately, the majority of children with this condition present relapses, usually associated with infections or vaccinations, but they can be treated alike. However, the nephrologist will better explain all of this to you.

KEY WORDS

Proteinuria: proteinuria.
Swelling/Puffiness: hinchazón.
Lower limbs: extremidades inferiores.
Urine output: diuresis.
Pitting edema: edema con fovea.
Overlying skin: piel suprayacente.
Nephrotic syndrome: síndrome nefrótico.
Gross hematuria: hematuria franca/macrocópica.
Idiopathic: idiopático.
Immunosuppressive treatment: tratamiento inmunosupresor.
IV line: vía venosa.
IV fluids: líquidos intravenosos.
Marked increase in total body water: aumento marcado del agua corporal total.
Massive urinary protein loss: pérdida urinaria masiva de proteínas.
Sodium and water retention: retención de sodio y agua.
Slight decrease in urine output: descenso escaso/ligero de la diuresis.
Intravascular volume depletion: depleción de volumen intravascular.
Pending results: resultados pendientes/pendiente de resultado.
Steroid therapy: corticoterapia.
Salt and fluid intake restriction: restricción de la ingesta de sal y líquidos.
Water balance: balance hídrico.
Avoid (to avoid): evitar.
Immobilisation: inmovilización.
Single morning dose: dosis única por la mañana.
Insensible fluid losses: pérdidas insensibles de líquidos.
Well-balanced high-protein and low-salt diet: dieta balanceada rica en proteínas y baja en sal.
Underlying immune disturbances: alteraciones inmunes subyacentes.
Be treated alike: ser tratado de la misma manera.



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