Case Report

The pregnant patient with partial lipodystrophy developing acute renal failure—onset of de novo membranoproliferative glomerulonephritis

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Introduction

Acute anuric renal failure in pregnancy requiring haemodialysis has become unusual. In the past, septic abortions at 12–16 weeks of pregnancy were the most common cause of acute renal failure (ARF) [1–4]. Nowadays, severe ARF in pregnancy is seen mostly towards the end of the gestation period, between 34 and 38 weeks, and it is invariably the result of pre-eclampsia and its complications or the result of severe blood loss [5–7]. Occasionally post-infectious glomerulonephritis may occur during pregnancy and can be responsible for ARF [8,9].

Partial lipodystrophy is characterized by atrophy of the subcutaneous fat in the face and the upper part of the body and it is often complicated by the development of a type II membranoproliferative glomerulonephritis (MPGN) with circulating low C3 in the presence of a nephritic factor, C3NeF [10–14]. We

Fig. 1. a,b. Partial lipodystrophy and characteristic absence of facial subcutaneous fat (by permission of patient).

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K. Demetriou et al. treated a case with post-infectious MPGN and ARF developing de novo in a pregnant woman with partial lipodystrophy.

Case

A 36-year-old primigravida was referred on 9 August 1994 to the Department of Nephrology at Nicosia General Hospital with a 10-day-long history of an upper respiratory tract infection, sore throat, and fever. Prior to her admission she had developed oedema of the ankles with proteinuria, and the serum creatinine, which was previously normal, rose to 4.2 mg%. Examination showed the classical picture of partial lipodystrophy with marked absence of subcutaneous fat on the face (Figure 1 a,b), trunk, and upper limbs. The pregnancy was estimated at 24 weeks, weight 72 kg, pulse 70 beats/min, BP 90/60 mmHg. There was marked oedema of the ankles extending up to the sacrum. Arm veins were characteristically very prominent due to lack of subcutaneous fat (Figure 2). Laboratory investigations on admission showed the following: Hb 7.2 g%, ESR 60 mm/h, WBC 8800/mm³, platelets 237000/mm³, creat 4.2 mg%, urea 89 mg%. C3 low at 20 mg% (normal range 85–193 mg%), C4 normal. A renal ultrasound showed both kidneys to be of normal size, normal morphology, and without any signs of obstruction.

There was a rapid deterioration in renal function and by 12 August there was oliguria and the serum creatinine had risen to 9.5 mg% (Figure 3). Haemodialysis was started on 14 August. Because of the lipodystrophy and the prominent veins, an arteriovenous fistula was constructed and used straight away. The patient underwent nine daily sessions of haemodialysis between the 14 and 22 August. She was treated with methylprednisolone 1 g i.v. on 3 consecutive days, followed by oral prednisone starting at a dose of 40 mg daily and rapidly declining. She was transfused 3 units of blood and received erythropoietin 4000 IU s.c. twice weekly for 4 weeks. She remained oliguric until 22 August and thereafter her urine output returned gradually to normal (Figure 3). The patient continued to improve, her pregnancy progressed at a satisfactory rate, and on 1 November 1994, at 36 weeks gestation, she had an elective Caesarean section with a healthy baby girl weighing 1700 g.

On 10 January 1995, 2.5 months after delivery, the mother was subjected to a percutaneous renal biopsy which yielded 30 glomeruli. Two were globally sclerosed. The remaining glomeruli showed various degrees of mesangial proliferation with an increased number.

Fig. 2. Partial lipodystrophy and absence of subcutaneous tissue in the forearms, rendering the veins very prominent.

Fig. 3. Serum creatinine and urine volume during the period of acute renal failure.
Pregnant patient with partial lipodystrophy developing ARF—onset of de novo MPGN of mesangial cells and mesangial matrix. There was also thickening of the glomerular capillary walls and some 30% of the glomeruli showed cellular and resolving crescents (Figure 4a). The interstitial tissue showed mild focal lymphocytic infiltration. Vessels were normal. On immunofluorescence there was positive staining with C3, C1q, and IgM along the capillary walls and in the mesangium. Electron microscopy showed thickening of the glomerular basement membranes due to intramembranous dense deposits (Figure 4b) together with huge subepithelial deposits (humps) (Figure 4c). There were also deposits in the mesangium. Similar electron-dense deposits were also present in Bowman’s capsule and in the tubular basement membranes.

Three years later the child is growing normally and the mother is well with normal kidney function, persistently low C3, and minimal proteinuria at ≈1 g/day. The partial lipodystrophy remains unchanged. The arteriovenous fistula in the right forearm has been closed and the vascular tree restored to normal.

Discussion

The number of obstetric cases of severe acute renal failure requiring the use of an artificial kidney has gradually fallen from 1:1000 deliveries in the 1950s to 1:5000 and now 1:10 000 deliveries [1,3,4]. Lindheimer et al. [2] report an even lower incidence, 1:20 000 deliveries in some specialized centres in the USA. This improvement is the result of the disappearance of the illegal septic abortions in the first trimester of pregnancy and the continuous improvement in antenatal care which has resulted in a marked reduction of cases of ARF from undiagnosed pre-eclampsia and its many complications.

The patient discussed here illustrates a very unusual cause of ARF during pregnancy and the remarkably good outcome is gratifying. She is a good example of post-infectious membranoproliferative glomerulonephritis at mid-pregnancy in a woman with partial lipodystrophy. The patient has maintained low serum C3 during the last 3 years of follow-up but we do not know whether she had a low C3 prior to her acute illness. Certainly there was no proteinuria in the early part of the pregnancy and prior to the development of the ARF. It is not known whether her partial lipodystrophy predisposed her to this unusually severe episode of post-infectious acute MPGN with ARF, or whether the upper respiratory tract infection simply triggered off this post-infectious nephritis in an individual who happened to have partial lipodystrophy and low C3 [12–15]. Singson and colleagues [9] described one case and reviewed other patients with post-infectious GN between 11 and 31 weeks of pregnancy, all with complete recovery of maternal renal function. They make no reference to patients with partial lipodystrophy. The good results in this case and in other reports show that the development of anuric renal failure in pregnancy should not be taken to imply

![Renal biopsy light microscopy × 200. Glomerulus with thickening of peripheral capillary walls, increased mesangial matrix and a small crescent.](a)

![Electron microscopy × 9000.](b)

![Electron microscopy × 9000. Huge subepithelial deposits (humps) together with mesangial deposits.](c)
necessarily a bad outcome. Young pregnant women have a great cardiovascular reserve, they tolerate haemodialysis well, and recovery of kidney function together with the birth of a healthy child are quite possible events. Every effort should be made to resuscitate and treat such patients [2,7,9].

References

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