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CASE REPORT

Spinal subarachnoid hematomas and cerebral infarctions in Goodpasture's disease

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Introduction: Goodpasture's disease with central nervous system involvement is extremely rare.
Case report: We report a 62-year-old woman with Goodpasture's disease (GD) associated with the presence of perinuclear anti-neutrophil cytoplasmic antibodies, complicated by spinal subarachnoid hematomas and cerebral infarctions. In spite of aggressive treatment, the patient died.
Conclusion: GD and anti-neutrophil cytoplasmic antibodies vasculitis should be suspected in patients presented with renal insufficiency with spinal and/or brain involvement.
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Keywords: GD; spinal subarachnoid hemorrhage; cerebral vasculitis

Introduction

Goodpasture's syndrome is defined by the presence of anti-glomerular basement membrane antibodies (anti-GBM Abs) with rapidly progressive glomerulonephritis and alveolar hemorrhage. Goodpasture's disease (GD) is characterized by the same clinical and biological patterns without pulmonary hemorrhage. We report a GD complicated by spinal subarachnoid hematomas and cerebral infarctions.

Case report

A 62-year-old woman without a medical history presented with acute lower limb edema, macroscopic hematuria and oliguria. Blood pressure, temperature, cardiopulmonary auscultation, abdominal and neurological examination were normal. Serum creatinine level was 920 $\mu mol\,l^{-1}$ associated with glomerular proteinuria, red blood cell casts and sterile leukocyturia. Serological testing showed elevated rates of anti-GBM Ab (80 $U\,ml^{-1}$, normal $<20\,U\,ml^{-1}$) and perinuclear anti-neutrophil cytoplasmic antibodies (pANCAs) with specificity for myeloperoxidase (100 $U\,ml^{-1}$, normal $<20\,U\,ml^{-1}$). C3 and C4 were normal. Serologies for human immunodeficiency virus, hepatitis C and hepatitis B, anti-streptolysines, anti-nuclear antibodies, cryoglobulinemia, rheumatoid factor, anti-beta2GP1, anticardiolipin antibodies and lupus anticoagulant, were negative. Renal ultrasound and chest radiography were normal. The renal biopsy revealed an extra-capillary proliferation with linear deposition of IgG on glomerular basement membrane. A diagnosis of GD, associated with pANCA, was made. Hemodialysis was started, followed by 14 sessions of daily plasmapheresis with corticosteroid therapy (pulse of 500 mg intravenous methylprednisolone during 5 days, followed by 60 mg per day of oral prednisone) and monthly infusions of 1000 mg cyclophosphamide. At 4 days after treatment onset, the patient presented with sudden interscapular pain. Clinical examination showed proximal muscle weakness of both the lower limbs (4/5 in psoas muscles according to the MRC scale) and pyramidal signs (brisk deep tendon reflexes and bilateral Babinski's sign). Proprioception, light touch and vibration sensation were mildly impaired below the level of T6, whereas temperature and pain sensation were preserved. Romberg's sign was absent. Sagittal T2-weighted magnetic resonance imaging (MRI) of the thoracic spine revealed extramedullary intradural low signal intensity at T4 and T5 levels, consistent with spinal subarachnoid hematomas and centromedullary high signal intensity from T1 to T6 levels (Figure 1). Brain MRI and MRA was normal. Cerebrospinal fluid analysis showed 6560 red and 6 white blood cells per mm^3, and increased protein level (0.71 $g\,l^{-1}$). Although the patient remained dialysis dependent, neurological examination was normal 1 month after treatment onset. Corticosteroid therapy was progressively tapered to 10 mg per day. At 6 months after initial brain imaging, MRI revealed acute asymptomatic left watershed infarction between middle and posterior cerebral artery territories (Figure 1), associated with stenosis of the left posterior temporal branch of the middle cerebral artery (MCA) on angiography (Figure 1). Subarachnoid hematomas disappeared on the spinal MRI. In contrast,

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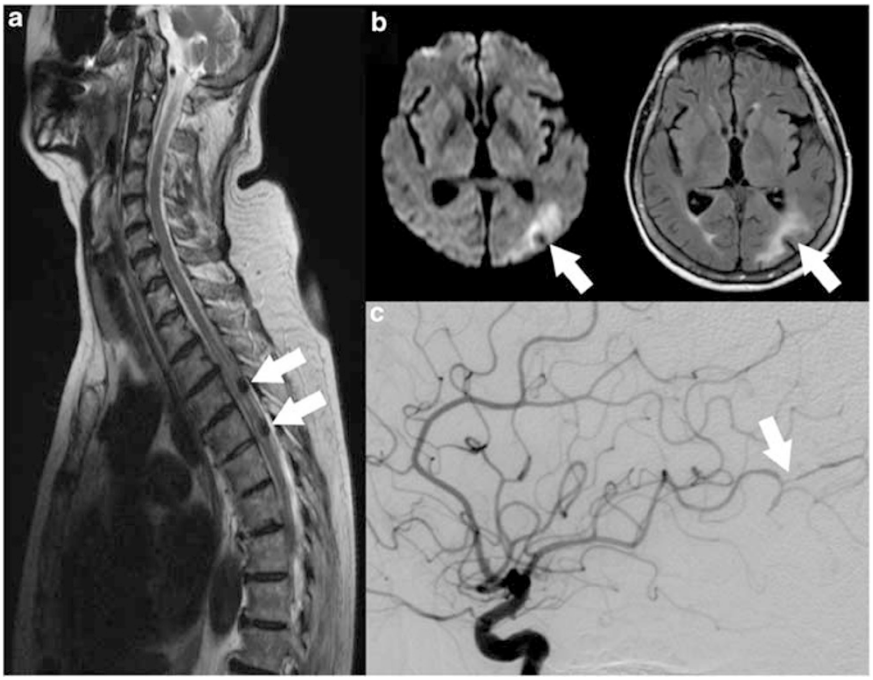

Figure 1 Spinal MRI sagittal T2-weighted images showing two spinal subarachnoid hematomas at T4 and T5 levels and centromedullary hyperintensity at T1–T6 levels (**a**). Brain MRI (DWI and FLAIR sequences) showing acute left watershed infarction between middle and posterior cerebral artery territories (**b**). Stenosis of the left posterior temporal branch of the middle cerebral artery is seen on angiography (**c**).

centromedullary high signal intensity persisted. Anti-GBM Ab and pANCA levels were at 20 and 50 U ml^{-1}, respectively. Corticosteroid therapy was increased to 60 mg per day. After 1 month, the patient presented with acute right-sided hemiplegia. MRI showed an infarction in the left MCA territory and appearance of a severe proximal MCA stenosis. Cerebrospinal fluid analysis and transoesophageal echocardiography were normal. Both anti-GBM Ab and pANCA were negative. Radiological abnormalities suggested a vasculitis diagnosis. Anti CD 20 treatment (intravenous rituximab 1 g weekly during 2 weeks) was started. After 9 months, a new left anterior cerebral artery infarction occurred. Corticoid treatment (10 mg per day) was maintained and rituximab was administrated at the same dose. The patient died 1 month later. Autopsy was refused by the members of the family.

Discussion

We report a patient with GD associated with the presence of pANCA, complicated by spinal subarachnoid hematomas and cerebral infarctions. In spite of aggressive treatment, the patient died. Occurrence of spinal subarachnoid hematoma and GD was not previously described. Spinal subarachnoid hemorrhage has been described in one case with necrotizing vasculitis related to polyarteritis nodosa with associated pANCA.[1] In our case, the origin of spinal subarachnoid hematomas was most likely due to leptomeningeal small vessel vasculitis. Brain infarctions were also probably related to vasculitis based on angiographic abnormalities. Only four Goodpasture cases (all without pANCA) with cerebral vasculitis have been previously described.[2–4] In all, 15–30% of Goodpasture patients had both anti-GBM Ab and pANCA. The role of these antibodies in the pathophysiology of central nervous system vasculitis is unclear. Deposition of anti-GBM Ab in the choroid plexus has been demonstrated by immunofluorescence studies.[5] Clinical deterioration in our patient occurred in the presence of low anti-GBM Ab levels, as found in previously reported GD patients with central nervous system vasculitis. Little is known about anti-GBM Ab levels in the cerebrospinal fluid and their potential pathophysiological role in the development of central nervous system vasculitis in Goodpasture patients. GD and ANCA vasculitis should be suspected in patients with renal insufficiency and spinal and/or brain involvement.

Conflict of interest

The authors declare no conflict of interest.

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