A patient with polycythaemia vera associated with membrano-proliferative glomerulonephritis

B K N Fernando[1], H S K Ruwanpathirana[1], T Veerasuthen[1]

Ceylon Medical Journal 2011; **56**: 119-120

Introduction

Myeloproliferative disorders (MPDs) are clonal disorders of the haematopoietic stem cells. These are classified as polycythaemia vera (PV), essential thrombocythaemia (ET), chronic myeloid leukaemia (CML) and myelofibrosis (MF) depending on the main haematopoietic lineage involved. Glomerulonephritis (GN) refers to a pattern of glomerular injury based on characteristic histopathology findings. GN associated with MPDs are rare in clinical practice. Although cases of polycythaemia with concomitant GN have occasionally been reported, there are few reports regarding PV. Amongst the few reported cases, focal segmental glomerulosclerosis (FSGS) is one of the most frequent forms that has been described. As far as we know PV associated with membranoproliferative glomerulonephritis (MPGN) has not been described before.

Case report

A 43-year old woman was admitted to hospital with a history of red eyes, painful red swollen hands and palpable erythematous rash over the limbs of three weeks duration. She also complained of headache and impaired vision. She was found to have high blood pressure one week prior to admission. On examination she was plethoric with conjunctival suffusion. Her hands were red and puffy. There was a palpable purpuric rash distributed predominantly in the extremities. Blood pressure was 110/90 mmHg. There was a 2 cm firm splenomegaly. Examination of the fundi revealed hyperaemic discs and tortuous vessels.

Investigations revealed haemoglobin of 22.5 g/dL, haematocrit of 70.7% red blood cell count of 8.06x1012/L, total leukocyte count of 12.4x109/L and platelets of 430x109/L. Blood picture showed elevation of all three cell lines. Urine analysis showed proteinuria of 3g/L without any dysmorphic red cells. Twenty four hour urine protein excretion showed a proteinuria of 1.135 g. Renal functions were normal. Arterial blood gas analysis showed PaO2 of 98.3 mmHg and oxygen saturation of 97%. Chest X-ray and echocardiogram were normal. Ultrasonography showed splenomegaly. Kidneys were normal in size. Computed tomography of the abdomen confirmed the findings.

Serum LDH was elevated. Serum erythropoietin was 4.6 IU/L (normal 3.7-29.5 IU/L). Vasulitic screening and ANA were negative. Serum complement levels were normal. Hepatitis B, C and HIV screening were negative. JAK2V617F and JAK2Exon12 mutations were absent. Bone marrow aspiration and trephine biopsy showed a markedly hypercellular marrow with erythroid predominance.

The diagnosis of (PV) was made as our patient fulfilled all three major criteria of polycythaemia vera study group (PVSG) diagnostic criteria. Due to constraints in assessing absolute red cell mass, indirect indices that reflect the red cell mass such as haemoglobin and haematocrit were considered. Percutaneous renal biopsy was performed to investigate proteinuria further and its findings confirmed MPGN.

Patient was subjected to several venesections once the diagnosis of PV was made and a target haematocrit of less than 45% was achieved during the hospital stay. She was started on aspirin and folic acid. Once the MPGN was diagnosed oral prednisolone was started 1mg/kg body weight/day. She was given nifedipine and captopril to keep the target blood pressure less than 120/70mmHg. Osteoporosis prophylaxis was started with alendronate. Currently she is on tapering doses of prednisolone and other medication. 24 hour urine protein excretion is checked every third month and the current value after six months of therapy is 0.357 g.

Discussion

MPGN may be primary or secondary. Majority of MPGNs are primary. The commonly identified secondary causes are autoimmune diseases, chronic viral, bacterial, protazoal infections, carcinoma of lung and breast, paraprotinaemias and chronic and recovered microangiopathies which includes polycythaemia [1]. Detection of MPGN is important as fifty percent of patients with MPGN develop end stage disease ten years after diagnosis, and ninety percent have renal insufficiency after twenty years. Early initiation of immunosuppressive treatment is worthwhile though there is only some evidence regarding steroids in MPGN [2].

[1]*Medical Unit, National Hospital of Sri Lanka.*

Correspondence: BKNF, *e-mail: <drnadee@yahoo.com>.* *Received 16 September 2010 and accepted 26 February 2011. Competing interests: none declared.*

Polycythaemia may be primary which is known as PV or secondary. PV results from clonal expansion of a transformed haematopoietic stem cell. This is associated with a prominent overproduction of erythrocytes and to a lesser extent, expansion of the granulocytic and megakaryocytic elements. PV is usually associated with genetic mutations such as JAK2V617F and JAK2Exon12. There are case reports of PV associated with glomerulonephritis such as FSGS, membranous GN and IgA nephropathy [3-7]. But there are no reported cases of PV associated with MPGN to our knowledge.

Some case reports on PV and GNs show improvement of cell counts and proteinuria after repeated venesections alone. The improvement of cell counts in our patient with repeated venesections was not sustainable and there was no improvement of proteinuria. However once she was commenced on oral prednisolone, she showed a sustained improvement in cell counts with dramatic improvement in her proteinuria. She did not require any more venesections thereafter. Long-term follow-up of this patient will be required to show whether the remission of proteinuria indicates resolution of the renal changes and a good prognosis.

References

1. Kathuria P, Senitko M, Singh S. Glomerulonephritis, Membranoproliferative. E medicine 2010.
2. Dennis LK, Anthony SF, Dan LL, *et al*. Harrison's Principles of Internal Medicine. 17th edn. McGraw Hill, 2009.
3. Plomely RF, Sullivan JR, Whitworth JA, *et al*. Polycythaemia vera and glomerulonephritis. *Australian and New Zealand Journal of Medicine* 1983; **13**: 125-9.
4. Sharma RK, Kohli HS, Arora P, *et al*. Focal segmental sclerosis in a patient with polycythemia rubra vera. *Nephron* 1995; **69**: 361.
5. Okuyama S, Hamai K, Fujishima M, *et al*. Focal segmental glomerulosclerosis associated with polycythemia vera: report of a case and review of the literature. *Cilnical Nephrology* 2007; **68**: 412-5.
6. Kasuno K, Ono T, Kamata T, *et al*. IgA nephropathy associated with polycythaemia vera: accelerated course. *Nephrology Dialysis Transplantation* 1997; **12**: 212-5.
7. Au WY, Chan KW, Lui SL, *et al*. Focal segmental glomerulosclerosis and mesangial sclerosis associated with myeloproliferative disorders. *American Journal of Kidney Disease* 1999; **34**: 889-93.