Case reports

Anaemia in lung transplant patient caused by parvovirus B19

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Abstract

The case history is presented of a lung transplant patient who developed prolonged parvovirus B19 infection with severe transfusion dependent anaemia. The patient was treated with intravenous immunoglobulin after which the haemoglobin rose, together with a reticulocytosis. The patient then remained transfusion free and the virus cleared more than three months after the initial immunoglobulin treatment. The clinical and social implications for this group of patients are discussed.

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Keywords: parvovirus B19; lung transplantation; immunoglobulin therapy

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Case history

The patient had undergone lung transplantation for cystic fibrosis and was maintained on FK506, azathioprine, and prednisolone immunosuppression. In addition, she had undergone total lymphoid irradiation for obliterative bronchiolitis. The patient presented (day 1) with severe shortness of breath and dizziness. The haemoglobin level was 3.5 g/dl and she was normocytic with reticulocytopenia and a normal white cell and platelet count. Blood parameters were normal and a bone marrow aspirate confirmed red cell aplasia.

The serum on day 1 was positive for parvovirus B19 DNA by dot blot DNA hybridisation[1] and polymerase chain reaction (PCR).[2] There was no humoral response to the infection as evidenced by a negative IgM and IgG response. Parvovirus B19 IgM was tested by radioimmunoassay[3] and IgG by ELISA (Biotrin International, Dublin, Ireland or Denka Seiken, Tokyo, Japan).

Following a blood transfusion the haemoglobin level rose to 10 g/dl (day 3). It then started to fall with a sustained reticulocytopenia and 56 days after the initial presentation the haemoglobin level was 6.3 g/dl with a reticulocyte percentage of 0.1. The patient was again transfused, having required two transfusions on days 17 and 30 after the initial transfusion.

At day 23 after her presentation the patient still had a high viral load and had failed to mount an IgM antibody response. There was, however, an equivocal reaction for parvovirus B19 specific IgG which was probably due to the passive transfer of antibody during the course of blood transfusions.

The patient's haemoglobin again fell from 12.7 g/dl on day 62 to 9.5 g/dl on day 79 after the initial presentation and she was treated with intravenous Sandoglobulin in a total daily dose of 0.4 g/kg.[4] However, because of chronic renal impairment secondary to the previous use of cyclosporin and FK506, we used only one quarter of the total dose on day 79, half the total dose on day 80, and three quarters of the total dose on day 81. The total dose of 0.4 g/kg was given only on day 82 after ensuring that renal function remained stable. The treatment was discontinued after six days because of deteriorating renal function. Serum taken before treatment showed a high viral load and equivocal IgG level. Parvovirus B19 IgM was positive, indicating that the patient was mounting an early response to the virus. An impressive reticulocytosis was seen on the second day of immunoglobulin therapy and a week later was 10.3% (fig 1).

Serum analysed after immunoglobulin therapy on day 84 was negative for parvovirus B19 by DNA dot blot hybridisation but remained PCR positive, indicating a persistent

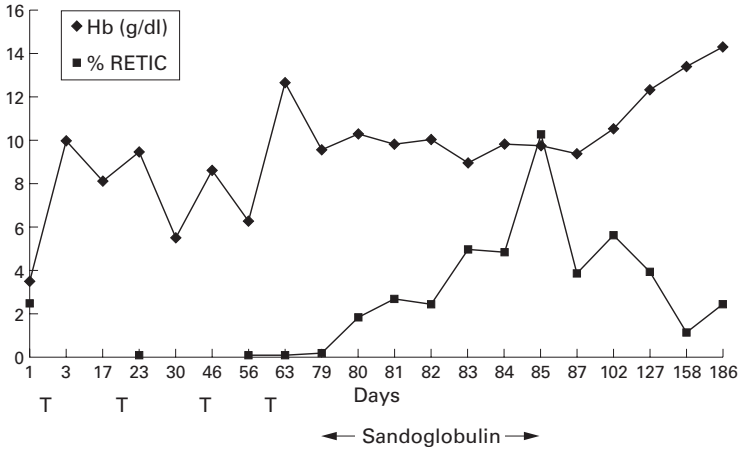

Figure 1 Duration of anaemia. Hb = haemoglobin; RETIC = reticulocytosis.

Table 1 Parvovirus B19 test results

Day	*IgM*	*IgG*	*Dot blot*	*PCR*
2	<1	0.176	+ve	+ve
23	<1	0.275	+ve	+ve
79	3.1	0.309	+ve	+ve
84	7.8	2.513	−ve	+ve
102	1.4	1.234	−ve	+ve
140	<1	1.316	−ve	+ve
192	<1	0.606	−ve	−ve

Sandoglobulin given on days 79, 80, 81, 82, 83, and 84.
IgM: <1 negative; >3 positive; 1–3 equivocal.
IgG: <0.80 negative; >1 positive; 0.8–1 equivocal.

viraemia but a low viral load. The IgM level was increased (table 1) and indicated an active immune response against the virus. The positive IgG at this stage, however, probably reflected passive transfer of antibody from the commercial immunoglobulin preparation.

The haemoglobin level was maintained at a value greater than 10 g/dl. The viral load remained low one month after treatment and, after a further three months, the haemoglobin level rose to 14 g/dl and the patient became PCR negative, indicating clearance of viraemia. The relatively lower levels of B19 IgG on days 140 and 192 represent a decline in the passive antibody received during treatment. B19 IgM became undetectable by day 140.

Discussion

This case emphasises the importance of including parvovirus B19 infection in the differential diagnosis of unexplained anaemia with reticulocytopenia in any patient following solid organ transplantation. It is a treatable cause of anaemia and minimises the use of any uncomfortable and unnecessary procedures for the patient.

It may be that the total lymphoid irradiation contributed to the prolonged course of the parvovirus B19 infection. Total lymphoid irradiation is known to be associated with the development of viral infections such as herpes simplex and cytomegalovirus.[5]

It is also important to prevent exposure of other people at risk of severe parvovirus B19 infection. Since 50% of the adult population lack antibodies and remain susceptible, contact with pregnant women and other immunosuppressed patients was avoided until the immunoglobulin therapy was completed and the dot blot DNA hybridisation was negative. There is evidence that treatment with immunoglobulin decreases viral shedding in respiratory secretions a million-fold so that infectivity is significantly lowered.[6] This is therefore another indication for instigating immunoglobulin therapy in patients with prolonged B19 infection.

At present the patient remains well. Despite the clearance of viraemia, parvovirus B19 may remain in the bone marrow[7] and thus has the potential to recur. This has serious implications for the patient should she be considered for retransplantation for her obliterative bronchiolitis in the future.

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Pneumothorax in adults with cystic fibrosis dependent on nasal intermittent positive pressure ventilation (NIPPV): a management dilemma

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Abstract

The management of pneumothorax in three adult patients with cystic fibrosis dependent on nasal intermittent positive pressure ventilation is described.
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Transplant listed patients with cystic fibrosis who develop hypercapnic hypoxic (type 2) respiratory failure can be kept alive until donor organs become available with the introduction of nasal intermittent positive pressure ventilation (NIPPV).[1] We describe the management of three transplant listed cystic fibrosis patients who developed pneumothoraces while dependent on NIPPV.

Case reports

A 20 year old man awaiting double lung transplantation was established on NIPPV because of deterioration in his spirometric values and blood gas tensions. He was infected with *Burkholderia cepacia*, had a forced expiratory