

THE USE OF ORAL IMMUNOGLOBULIN IN THE TREATMENT OF CRYPTOSPORIDIUM IN IMMUNOCOMPROMISED CHILDREN

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A seven month old baby presented with pelvic rhabdomyosarcoma and treated with Ifsophamide, vincristine and actinomycin D. A week after chemotherapy he developed diarrhoea, vomiting and febrile neutropenia and was given broad spectrum antibiotics and metronidazole. The fever settled but the diarrhoea and vomiting persisted. Stool cultures grew cryptosporidium which did not respond to the conventional treatment. Oral immunoglobulin was given for 4 days, following which the diarrhoea and vomiting became less frequent and the condition improved. Repeated stool cultures failed to grow cryptosporidium. We conclude that crypto-sporidium can cause diarrhoea in the immunocompromised children and that oral immunoglobulins appear to be an effective mode of therapy. Bahrain Med Bull 1996;18(1):

Protozoa of the genus cryptosporidium are uncommonly recognised pathogen of the human intestinal tract. They exist in nature as zoonoses involving such animals as cows and sheeps, with transmission via the faecal-oral route of the oocyst that are infective at the time of passages¹.

In immunologically normal children, the protozoan generally causes an acute, self limiting illness of 5-10 days duration and characterised by watery diarrhoea, abdominal pain and nausea². By contrast, cryptosporidial infection in immuno-compromised children may produce severe life threatening diarrhoea that persists for months or years³.

Recently it was advocated that oral immunoglobulin can be used to treat immunocompromised children with cryptosporidial infection^{4,5}. We report a child who presented with cryptosporidial infection shortly after starting him on chemotherapy. This child had prompt resolution of his symptoms soon after starting him on oral immunoglobulin.

THE CASE

Seven months old baby was diagnosed as pelvic

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Rhabdomyosarcoma. He was treated with MMT 89 SIOP protocol which included the administration of 3 weekly courses of ifosfamide, vincristine and actinomyun D.

A week after starting the first course, the baby developed diarrhoea and vomiting and intermittent irritability. The diarrhoea was frequent, greenish and mucus-like. He was not tolerating oral feeds, and started to loose weight necessitating total parenteral nutrition. During this period he became neutropenic and developed fever and was given broad spectrum antibiotics and metronidazole. The diarrhoea and vomiting persist although his fever settled down.

Laboratory studies showed a haemoglobin level of 11.1 gm/dl, leukocytic count of $0.3 \times 10^9/L$ and platelets of $89 \times 10^9/L$.

The serum sodium concentration was 144 mmol/L, potassium 2.7 mmol/L, chloride 109 mmol/L, calcium 2.08 mmol/L and magnesium 0.6 mmol/L. Liver function test showed bilirubin of 11 mmol/L, conjugated 7 mol/L, AST 558 IU, ALT 192 IU, alkaline phosphatase of 229 IU, and total protein of 60 gm/L with albumin of 3 gm/L. Serum urea and creatinine and immunoglobulins were all normal. Cultures of the stool for bacterial pathogens, *clostridium difficile* and rotavirus were negative.

Examination of the stools failed to reveal any ova or parasites. However one week after the onset of the symptoms stool culture showed cryptosporidium. The repeated blood count on day 10 of treatment showed haemoglobin of 10 gm/dl, leukocytic count of $2.1 \times 10^9/L$, and platelets of $145 \times 10^{12}/L$.

The child continued to have diarrhoea and vomiting despite therapy to treat the symptoms and the stool cultures continued to grow cryptosporidium.

After one month oral immunoglobulin (Sandoglobulin) in a dose of 50 mg/kg per day in 4 divided portions was given through the nasogastric tube for a total of 4 days. Four days after stopping the immunoglobulin, the frequency of the diarrhoea and vomiting became less and his irritability decreased. Initially he was not tolerating the feed but one week later, he starts to eat and gradually gained weight. The repeated stool cultures failed to grow cryptosporidium and serum electrolytes and liver function tests were normal. The baby remained free of symptoms for more than two months.

DISCUSSION

Cryptosporidial infection is a self limited disease in an immunocompetent patient but can be fatal in immunocompromised patients. Chronic cryptosporidial disease has been reported in patient with acquired immunodeficiency syndrome^{6,7}, and in children under chemotherapy for cancer⁸.

This patient developed symptoms and sign consistent with cryptosporidium which had been cultured in the stools 7 days after the onset of symptoms.

At present there is no uniformly effective therapy for cryptosporidial infection. Recently it has been advocated that oral immunoglobulin can be used as a modality for therapy in chronic cryptosporidial infection in immunodeficient children⁴, and in patients with immunodeficiency and chronic diarrhoea⁵. In an attempt to eradicate the cryptosporidial infection in this baby we used the intravenously administered immunoglobulin (Sandoglobulin) orally. This modality of treatment had been used for bone marrow transplant patients who may be infected with enteric pathogens including adenovirus, *clostridium difficile*^{9,10} and in immunodeficient children with diarrhoea secondary to cryptosporidial infection¹¹.

It appears that the immunoglobulin exerts a protective effect through its opsonizing and antitoxic properties¹² and it was demonstrated that oral immunoglobulin is well tolerated and in substantial amount can also be used in bone marrow transplantation recipients.

CONCLUSION

Cryptosporidium infection should be considered a common possible causes of diarrhoea in the immunocompromised children and that orally administered human serum immunoglobulin appear to be effective mode of treatment of such infection.

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