Successful Management of Persistent Diarrhoea in Infants

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SUMMARY

Ten infants with persistent, dehydrating diarrhoea were given a combination of gentamicin, metronidazole and cholestyramine by mouth. Daily stool weights were recorded before and during treatment, and in all cases there was a marked decrease in the severity of the diarrhoea. The combination of medications is a safe and effective form of treatment for persistent infantile diarrhoea.


Protracted diarrhoea is a difficult therapeutic problem in young infants. Many causative factors have been suggested in the apparent failure of some infants to recover rapidly from acute diarrhoea, which is usually a self-limiting condition. One of the factors is the presence of abnormal bacterial microflora in the upper small bowel, and a second factor is the effect exerted on the movement of water and electrolytes by the presence of unconjugated dihydroxy bile salts in the gut lumen. These two factors may well be interrelated, since anaerobic organisms present in the bacterial overgrowth can cause deconjugation and dehydroxylation of bile acids.

Assuming that these factors, either singly or in combination, are of prime importance in the pathogenesis of protracted diarrhoea in infants, the administration of antibacterial agents together with a bile acid-binding resin should be effective in the treatment. To test this assumption a combination of gentamicin, metronidazole and cholestyramine was administered by mouth to infants with persistent, dehydrating diarrhoea. The results are reported in this study.

PATIENTS AND METHODS

Ten infants (mean age 3.5 months; range 1.5 - 7 months) were studied. Only male infants were included, to facilitate separate collection of stool and urine. Individual details of the infants are shown in Table I.

All had been in hospital for a minimum of 8 days before their inclusion in the study and had required continuous intravenous infusion to maintain normal hydration. Five of the infants were receiving a soya protein formula and the rest a cow’s milk protein formula in a volume of 120 ml/kg/d. No dietary change was made for a minimum of 48 hours before inclusion in or during the entire period of the study. Half-strength Darrow's solution in 5% dextrose water had to be administered intravenously throughout to maintain satisfactory hydration.

In patients 2 and 3 a Campylobacter fetus jejuni had been isolated from stools on culture. Both these infants, as well as patients 1, 4 and 5, in whom stool culture failed to reveal any pathogens, had previously received a 5-day course of parenteral penicillin and gentamicin, without signs of improvement. A further 3 infants in whom no pathogens were isolated (patients 6, 9 and 10), as well as patient 1 with a Salmonella group R (patient 7) and 1 with a C. fetus jejuni (patient 8) on stool culture, had received no parenteral antibiotics before the trial.

The infants were nursed on a metabolic bed and daily stool weights were recorded before and during the administration of the oral medication. To facilitate comparison between the infants, stool volumes were expressed as stool wt/kg/d.

The drugs were administered together and consisted of the following: (i) gentamicin 50 mg/kg/d in 6 divided doses orally for 3 days (maximum 360 mg/d); (ii) metronidazole 100 mg 8-hourly orally for 5 days; and (iii) cholestyramine 1 g 6-hourly for 5 days.

RESULTS

The daily stool weights for each of these infants are shown in Table I. Before the administration of the oral medication they all had severe diarrhoea, with stool weights ranging from 42.2 to 163.3 g/kg/d.

After the introduction of the gentamicin, metronidazole and cholestyramine combination there was a marked decrease in stool weight during the first 24 hours, with a more gradual but progressive decline thereafter. A decrease in the intravenous fluid requirements accompanied the decline in daily stool volume. Within 48 hours of starting treatment, intravenous fluids could be discontinued in all cases. The effect of treatment on the stool output has been depicted graphically in Fig. 1.

A noticeable improvement in the general well-being of the infants accompanied the decrease in severity of the diarrhoea in all cases. After the completion of medication the infants continued to improve and those not already on a lactose-containing cow’s milk protein formula were challenged with such a milk (Nespray), without any adverse effect. Within 7 days of the discontinuation of treatment all the infants were passing normal stools and were fit for discharge.
DISCUSSION

The infants in this study all responded to treatment with an immediate improvement in well-being and a marked and sustained reduction in diarrhoea. The combination of drugs may achieve these results in at least two ways. The bacterial overgrowth may damage the intestinal mucosa and be directly responsible for persistent diarrhoea. In this case the administration of antibacterial agents alone should be effective. Conversely, the bacterial overgrowth may only be indirectly responsible for the diarrhoea, either by causing deconjugation and dehydroxylation of bile salts or by the elaboration of toxins. Cholestyramine would then be important in the treatment, since it binds bile salts, rendering them inactive, and has also been shown to be capable of binding endotoxin.²

No clinical evidence of adverse effects of the medications given was noted. A mild metabolic acidosis associated with the use of cholestyramine² was demonstrated on occasion, but required no treatment and resolved spontaneously once administration of the drug was discontinued.

Further studies will be required to determine more exactly the role of antibacterial agents and cholestyramine

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**Fig. 1. Stool weight before and during oral medication with gentamicin, metronidazole and cholestyramine.**

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**TABLE 1: DETAILS OF PATIENTS AND DAILY STOOL WEIGHTS BEFORE AND DURING TREATMENT**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (m.o.)</th>
<th>Period in hospital before treatment (d)</th>
<th>Milk feeds</th>
<th>Weight (g)</th>
<th>Daily stool weight before treatment (g/kg)</th>
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<tr>
<td>1</td>
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<td>1</td>
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</tr>
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REFERENCES


Lump in the Throat

J. L. LANE

SUMMARY

The symptoms of repeatedly swallowing what the patient believes is a postnasal discharge, lump in the throat, and constantly having to clear the throat are commonly encountered in patients who do not show any evidence of sinusitis or organic lesions in the upper gastro-intestinal tract or larynx. It is suggested that incompetence of the lower oesophageal sphincter could lead to the creation of this situation by lowering the pH in the oesophagus and initiating inco-ordinate peristaltic movement.

A trial of treatment of 54 patients, selected on a non-randomized consecutive basis and presenting with the above symptoms, was undertaken, treatment being aimed at increasing the cholinergic activity of the oesophageal smooth muscle and neutralizing acidity. Metoclopramide (Maxolon, Primperan) was the cholinergic agent and polymethylsiloxane aluminium hydroxide (Asilone) was the antacid selected. Results based on symptomatic improvement showed that of 44 patients who reported for the follow-up examination, 35 (83%) had good symptomatic improvement, and 7 (16%) were unchanged. The action of metoclopramide is discussed and some of the literature reviewed. Favourable symptomatic improvement suggests that further trials using this substance, together with a placebo, on a cross-over randomized basis would be worthwhile.

The 'lump in the throat' syndrome can be recognized by the symptom tetrad of: (i) lump in the throat; (ii) repetitive swallowing; (iii) clearing of the throat; and (iv) indigestion.


Patients commonly present with what they think is a lump in the throat or a postnasal drip causing them to swallow repeatedly. The more they swallow, the more difficult it becomes and they feel they are unable to dislodge the lump. They often find themselves forcefully clearing the throat and coughing up a blob of mucus which they then either swallow or spit out. They believe that they have either an intractable postnasal drip due to sinusitis or a growth in the throat. Treatment with decongestants and medicines containing anticholinergics is often prescribed to dry up the postnasal drip. Invariably this treatment is unhelpful and often the symptoms become worse. Procedures such as antrum washouts or more radical nasal or sinus surgery may have been performed. Patients reporting that they repeatedly have to 'swallow against something' are often convinced they have an obstruction in the throat; the harder they try to overcome this obstruction by swallowing, the more difficult it becomes as the saliva decreases. Sometimes the patient believes he has a goitre. The symptoms have usually been present 3-4 months before the...