Cefuroxime axetil in the treatment of acute sinusitis in childhood

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A study of the efficacy of cefuroxime axetil was conducted for the treatment of acute sinusitis in childhood. Thirty-nine patients aged 5-14 years were given cefuroxime axetil 20 mg/kg/day divided into two doses for seven days. The diagnosis of acute sinusitis was based on history, physical examination, and radiological findings. The results of throat cultures before treatment were 17 patients with group A /?-haemolytic streptococci, seven patients with pneumococci, and two patients with Staphylococcus aureus; in the remainder of the patients only normal throat flora were isolated. In 36 patients (92%) a satisfactory improvement was reported at the end of the treatment. It was found that cefuroxime axetil was efficacious for the treatment of sinusitis in childhood.

Introduction

Acute bacterial sinusitis is a common clinical problem in childhood (Wald, 1992). The incidence of acute sinusitis remains to be defined and the criteria for diagnosis vary widely. Between 5% and 10% of upper respiratory infections may be complicated by acute sinusitis. Microbiologic evaluation of patients with acute sinusitis requires sinus aspiration, but this method is a difficult procedure and so should be reserved for use in cases of treatment failure. An empirical therapy for acute sinusitis should ideally be effective against Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis. Other bacterial species recovered much less frequently include Group A streptococci, Group C streptococci, Streptococcus viridans, peptostreptococci, and other Moraxella spp. (Wald et al., 1981, 1984). Antibiotics that penetrate well into the sinuses, and are stable against bacterial /?-lactamases are preferred in the treatment of acute sinusitis (Anderson, Maurer & Dajani, 1980; Jackson et al., 1984). Cefuroxime axetil is a second-generation cephalosporin characterized by stability to /?-lactamases of Gram-positive and Gram-negative bacteria. Oral administration and its extended half-life allow twice-daily dosing, a treatment regimen that facilitates patients' compliance (Sommers et al., 1984; Knapp & Washington, 1988; James et al., 1991).

The purpose of this study was to evaluate the effectiveness of cefuroxime axetil in the treatment of children with acute sinusitis.

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Patients and methods

Thirty-nine patients with clinical and radiographic evidence of acute sinusitis were studied. The duration of symptoms in each case was less than 30 days. Clinical signs and symptoms were recorded, and throat culture and radiography of the sinuses were performed at patient enrollment. Cefuroxime axetil was administered orally twice daily at a dose of 20 mg/kg per day for 7 days. On the last day of treatment all patients were re-examined. Radiological findings, physical signs and symptoms were evaluated and throat culture was repeated. The resolution of clinical symptoms with radiographic evidence of improvement was defined as cure; improvement of clinical symptoms and radiographic evidence of residual sinus congestion was defined as improvement; and no improvement of clinical symptoms with persistence of radiographic findings was defined as failure (Wald et al., 1984; Wald, Chiponis & Ledesma-Medina, 1986; Wald, 1992). Patients were followed-up for three months.

Results and discussion

Of 39 patients (aged 5–14 years), 16 (41%) were female and all had maxillary sinusitis. Presenting symptoms and signs of acute sinusitis were cough (69%), nasal discharge (54%), headache (49%), hypertrophied tonsils (44%), tenderness on percussion (31%), and postnasal drip (26%). Radiographic findings were complete or incomplete opacification in 33 patients (85%), mucosal thickening (31%), and air-fluid level in one case. Clinical diagnosis of tonsillitis/pharyngitis (26 patients), otitis media (four patients) and asthma (three patients) were made concurrently.

Bacterial isolates obtained from pre-treatment throat cultures included group A β-haemolytic streptococci in 17 patients (44%), pneumococci in seven patients (18%), and *S. aureus* in two patients (5%). All 26 of these isolates were susceptible to cefuroxime on disc testing.

At the end of treatment, 36 patients (92%) were cured or improved. Three patients (8%) did not respond to the treatment. An air-fluid level persisted in one patient and mucosal thickening in one patient of the three who did not respond to treatment. Symptoms such as nasal discharge, fetid breath, hypertrophied tonsil, and postnasal drip continued, and group A β-haemolytic streptococcus, and *S. aureus* were isolated in two of the three treatment failure patients. Cefuroxime axetil treatment was administered in a dose of 20 mg/kg per day for an additional 7 days in three patients. Two of the patients were cured with this treatment. The third patient did not respond, and erythromycin (40 mg/kg/day) plus co-trimoxazole (8 mg trimethoprim + 40 mg sulphamethoxazole/kg/day) therapy for 10 days resulted in symptom resolution. None of the patients subsequently had relapse of symptoms in the three months after cessation of antibiotic treatment. Diarrhoea was an adverse event in one patient.

The symptoms of our patients were in accordance with those of the previous investigations (Wald et al., 1981, 1984).

Viral illness, anatomic obstruction, immunodeficiencies (especially Ig G, and Ig A deficiency), and immotile cilia syndrome are predisposing factors for sinusitis in the paediatric age group. Recurrent sinusitis is more prevalent in asthma patients and such episodes may trigger flare-ups of reactive airway disease (Riding & Irvine, 1987; Shapiro et al., 1991). We observed upper respiratory infections in most of the patients,
hypertrophied tonsils in 44%, hypertrophied adenoids in 10%, and signs of asthma in 8% of cases.

Microbial pathogens in sinusitis are determined ideally by sinus aspiration, but this is a difficult procedure particularly in children. Therefore, we performed only throat culture to determine potential pathogens. In almost half of the study group group A β-haemolytic streptococci were isolated. We did not culture specifically for anaerobic bacteria, but these are more prevalent in chronic as opposed to acute sinusitis.

Transillumination and ultrasonography may be helpful in the diagnosis of sinusitis. CT and MRI are not necessary in children with uncomplicated acute sinusitis and should be reserved for the evaluation of recurrent or chronic sinus infections (Wald, 1992; Druce, 1993). In children with signs and symptoms of acute sinus infection plain radiography is sufficient to confirm or exclude the diagnosis. Radiologic findings in acute sinusitis include diffuse opacification, mucosal thickening of at least 4 mm, or an air-fluid level (Camacho et al., 1992; Wald, 1992). Radiographic findings of our patients were in accordance with these descriptions.

Cefuroxime axetil has been compared with co-amoxiclav and cefaclor for the treatment of upper respiratory tract infections such as tonsillitis, otitis, and sinusitis (Griffiths et al., 1987; Hebblethwaite, Brown & Cox, 1987; Brodie, Knight & Cunningham, 1989). Syndor et al. (1989) reported that in a randomized control trial, treatment with cefuroxime axetil achieved a higher bacterial eradication rate (71% vs 95%) than cefaclor. In another clinical study cefuroxime axetil was reported to be as effective as amoxiclav with fewer side effects (Camacho et al., 1992). In our investigations the cure and improvement rate of patients was 92%. This relatively lower cure rate in comparison with other studies can be attributed to the shorter treatment period (7 vs 10 days). Diarrhoea, tremor and convulsions were reported by Camacho et al. (1992) during treatment with cefuroxime axetil. In our study, only diarrhoea was observed in one patient. We conclude that cefuroxime axetil 20 mg/kg divided into two daily doses for seven days is effective for the treatment of acute bacterial sinusitis in childhood.

References


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