one anaphylaxis-type reaction with profound and prolonged hypotension. I found myself lowering the dose of the contrast agent, slowing the rate of injection and supervising the patients for 10 to 15 minutes, and longer in some cases. The increase in the severity and incidence of side effects continued when I changed the dye lot of the contrast agent.

I was considering the possibility that the 50-ml disposable syringes (Plastipak, Becton-Dickinson, Rutherford, New Jersey) were involved when I chanced to read a recall notice sent out to Canadian hospitals regarding 1- and 3-ml Plastipak syringes that showed particulate contamination. I sent samples of three lots of my syringes — one lot that I had just been using, one lot about to be used and a third lot to be used subsequently — to the bureau of medical devices, health protection branch, Department of National Health and Welfare in Ottawa for analysis as to any cause of contamination of the contrast agent by particulate or soluble substances.

Studies using mass spectroscopy revealed that if the rubber stoppers of these syringes were soaked in the radiopaque medium Hypaque-M 76% (Winthrop Laboratories) and in similar agents, constituents of the rubber, particularly a phenolic compound, dissolved into the contrast agent. The rubber stopper of the syringe lot that I had been using yielded two to three times as much of the phenolic contaminant as did the others.

Adverse reactions to intravenous pyelography have been attributed to the patients' reactions to the particular chemical structure of the iodinated contrast agent or its degradation products. Many patients who experience reactions closely simulating IgE-mediated allergic responses have had no previous exposure to contrast agents of similar chemical structure. We now know that there can be significant contamination of contrast agents by noxious chemicals related to rubber manufacturing, such contamination varying with the batch of the rubber stoppers, the duration of exposure and probably the deterioration of rubber over time. The contribution of this contamination to the overall incidence of adverse reactions could be substantial.

It is strongly recommended that only inert syringes (e.g., glass) be used for intravenous injection of contrast agents. If syringes with rubber stoppers are used at all for intravenous pyelography injections they should be loaded immediately prior to use and not left loaded in advance, a practice that was very common in my office. As a corollary, all rubber-stoppered injectable agents, particularly angiographic contrast agents, should be stored upright.

I thank the director and staff of the bureau of medical devices for finding the answer to the problem that I presented to them.

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Prosthetic valve bacterial endocarditis caused by *Kingella kingae*

Despite advances in diagnosis and treatment, bacterial endocarditis continues to have high mortality and morbidity. Bacterial endocarditis involving prosthetic heart valves is a particularly severe and increasingly frequent problem. This may be related to several factors, including the increasing proliferation of prosthetic heart valves, longer survival of recipients and improved laboratory techniques for isolation and identification of bacteria. *Staphylococcus aureus* and other gram-positive organisms are the commonest cause of prosthetic valve endocarditis, but gram-negative organisms have also been implicated.[1,2] We report on a patient with bacterial endocarditis caused by *Kingella kingae*, a gram-negative coccobacillus that has been a rare cause of bacterial endocarditis.

Case report

A 16-year-old boy who had undergone aortic valve replacement for congenital unicuspid valve was seen by his family physician 6 months after the operation. The boy had a 24-hour history of a high temperature (39.5°C), chills, nausea and vomiting. There was no history of infection or dental procedures. No focus for the fever was discovered by physical examination. The cardiovascular findings were unchanged; a grade 2/6 systolic ejection murmur without a diastolic component was heard.

He was admitted to hospital and a series of nine blood samples were obtained for culture. The leukocyte count was 12 200 × 10^9/l (73% of the cells were neutrophils and 12% band forms). The erythrocyte sedimentation rate was 36 mm/h. Before culture results were available a presumptive clinical diagnosis of prosthetic valve endocarditis was made and intravenous therapy with cloxacillin and gentamicin begun. An organism subsequently identified as *K. kingae* was isolated from all nine blood samples.

The patient was transferred to another hospital 10 days later. There was no change in his cardiovascular status, and he had no signs of ocular, skin or peripheral lesions associated with endocarditis. An electrocardiogram, an echocardiogram and a chest x-ray film showed no significant changes from earlier in the year. The patient continued to receive cloxacillin and gentamicin intravenously. The results of sensitivity tests showed that the organism was resistant to cloxacillin but sensitive to ampicillin (minimum bactericidal concentration [MBC] 0.8 μg/ml), penicillin (MBC 0.03 U/ml) and gentamicin (MBC 0.3 μg/ml). The cloxacillin was replaced with ampicillin, and the gentamicin therapy was continued. While these antibiotics were being given, the serum inhibitory and bactericidal titres were greater than 1:2048. After 6 days, therapy with penicillin V, 900 mg by mouth four times daily, was begun. The serum inhibitory and bactericidal titres were 1:256 while the patient was receiving only the penicillin.

It had been noted that the patient had exceptionally poor dental hygiene. Twelve restorations and one extraction were carried out while the patient was receiving penicillin V. Gentamicin was also given intravenously 1/2 to 1 hour prior to each dental treatment. The patient tolerated these procedures well and was

discharged from hospital 5 weeks after admission to the first hospital. He continued to take penicillin orally under close supervision for 10 days. There was no recurrence of symptoms.

Comments

Organisms belonging to the genus *Kingella* (formerly included in the genus *Moraxella*) have been reported as causes of endocarditis at least four times this century.[2-5] Because there are difficulties in isolating and identifying this fastidious organism, the number of cases may actually be much higher than this. Although the diagnosis of prosthetic valve endocarditis was not proven in our patient, the presence of persistent bacteremia with no apparent focus in a patient with a prosthetic valve is usually adequate to make a presumptive diagnosis.[1] Many patients with prosthetic valve endocarditis have the diagnosis established only at autopsy. In our patient infection was thought to be related to his poor oral hygiene since *Kingella* normally resides in the oropharynx. Although *Moraxella* and *Kingella* species have been uncommon causes of endocarditis, an association with abnormal or prosthetic heart valves has been seen.[1] The organism is extremely sensitive to penicillin, which is the drug of choice. It appears that prosthetic valve endocarditis caused by *Kingella* has a good prognosis because of its sensitivity to penicillin and its low destructive potential.

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Infection of the diaper area caused by *Epidermophyton floccosum*

Diaper rash is the most common cutaneous disorder in infants and young children.[1] Candidal diaper dermatitis is well recognized, but superficial fungal infections of the diaper area are uncommon. Few reports of diaper dermatophytosis caused by *Epidermophyton floccosum*[2-4] or by *Trichophyton rubrum*[5] have appeared in the literature, and neither a recent textbook of pediatric dermatology[1] nor a review[6] lists dermatophytes as possible causes of dermatoses in the diaper area. This report describes a 5-month-old infant with *E. floccosum* infection in the diaper area.

Case report

A 5-month-old infant was seen by a family physician because of circular erythematous lesions about 1.5 cm in diameter on the lower aspect of her abdomen and on the inner thighs. As the lesions suggested a diaper rash, the patient was treated with corticosteroid ointment for 3 months. However, the lesions did not clear and continued to enlarge. Neither the patient nor her mother had had previous dermatologic problems. The patient's father had previously suffered from a "ringworm" infection that had been restricted to his inner thighs. Topical treatment with an antifungal agent had resulted in prompt resolution of the eruption.

At 8 months of age the infant was examined by another physician, who found an active, alert infant with dry, erythematous, scaling, circumscribed lesions with central clearing and raised borders confined to the diaper area. Skin scrapings were obtained without discontinuation of the topical corticosteroid treatment. Results of a potassium hydroxide examination of a scraping from a scaly lesion were negative. A culture of the scraping on Sabouraud's dextrose agar with cycloheximide, gentamicin and chloramphenicol yielded a growth of *E. floccosum* after 7 days of incubation at 28°C. The patient was treated with 1% clotrimazole cream twice a day. Four weeks after therapy the lesions had cleared completely.

Comments

E. floccosum has been the most common etiologic agent of tinea cruris in adolescents and adults. Infection by this fungus usually occurs through direct contact with infected individuals. The patient described here had presumably acquired the infection from her father. The initial clinical manifestation of the patient's lesions suggested a superficial fungal disorder caused by dermatophytes. Direct examination of potassium hydroxide preparations and of cultures of scrapings from the involved areas could not be done to confirm this.

It is likely that the long-term, uninterrupted corticosteroid therapy in this patient suppressed the fungus in the skin scrapings, resulting in negative results of microscopic examination of potassium hydroxide preparations. If fungus is suspected but is not found by such examinations, all topical treatment should be discontinued for a few days and scrapings taken again for direct examination and culture.

This case suggests that *E. floccosum* dermatophytosis should be considered in infants with diaper dermatitis.

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