toxigenic strains of *Staph aureus* that produced enterotoxin F were isolated from high vaginal swabs from each patient (see table). Treatment with intravenous fluids and appropriate anti-staphylococcal antibiotics was followed by complete clinical resolution.

Cases of toxic-shock syndrome: clinical features and properties of Staphylococcus aureus *strains isolated*

	Case 1	Case 2	Case 3	Case 4
Date of presentation	Dec 1980	Oct 1981	Nov 1981	March 1982
Age (years)	18	18	18	35
Temperature ≥38·9°C	+	+	+	+
Scarlatiniform rash	+	+	+	+
Desquamation during convalescence	+	+	+	+
Syncope during previous 24 hours	+	−	+	+
Blood pressure (mm Hg) on admission	100/55	80/50	60/30	80/60
Profuse watery diarrhoea	+	+	+	+
Myalgia	+	+	+	+
Conjunctival hyperaemia	+	+	+	+
Vaginitis on admission	+	+	−	−
Symptoms associated with menstruation	+	+	+	−
Tampon present	Lillet	Lillet Super	Lillet Super Plus	−
Staph aureus strain isolated	+	+	+	+
Site of isolation	High vaginal swab*	High vaginal swab†	High vaginal swab	Breast abscess
Phage type	29/52/80	83A	29/52	29/25/80
Enterotoxins detected	A + F	B + D + F	A + F	A + F

*A phage group II strain which produced epidermolytic toxin A was also isolated from vaginal and nose swabs.
†A non-typable strain that produced enterotoxin F alone was isolated from the nose of this patient.

Case 4—A 35-year-old Filipino woman presented with a two-day history of pain in the right breast, fever, vomiting, and profuse watery diarrhoea three weeks after forceps delivery of a healthy infant. While in the maternity hospital the baby was reported to have developed a sticky eye, but no bacteriological report was available. On examination the patient had a fever of 39°C, her blood pressure was 80/50 mm Hg, and her right breast was diffusely tender. She had severe muscle tenderness but results of vaginal examination were normal for three weeks post partum. Investigations showed a neutrophil leucocytosis with a platelet count of 75×10^9/l, abnormal electrolyte values (sodium 128 mmol(mEq)/l), urea concentration 29·5 mmol/l (177 mg/100 ml), and creatinine concentration 583 mmol/l (5·8 mg/100 ml). Serum creatinine phosphokinase activity was raised at 332 IU/l, calcium concentration low at 1·6 mmol/l (6·5 mg/100 ml), and alkaline phosphatase activity 234 IU/l. Blood cultures, high vaginal swabs, faeces, and throat swabs collected on admission yielded no *Staph aureus* or other pathogens. Septicaemic illness or toxic-shock syndrome was diagnosed and she was given intravenous antibiotics and fluids. On day 1 she passed only 300 ml urine and developed a macular rash on face and trunk. On day 3 her right breast became more swollen and an abscess was drained: the pus yielded a pure heavy growth of *Staph aureus* (phage type 29/52). She improved rapidly and on day 9 showed the characteristic skin desquamation on palms, soles, and face. On discharge her renal function was normal and abscess wound dry. The strain was subsequently shown to produce enterotoxins A and F.

Comment

That three girls presented with tampon-associated toxic-shock syndrome in this area within 11 months indicates that the syndrome may not be as rare as generally believed. There is, however, a much higher proportion of young women than average in the St Stephen's Hospital catchment area. There has been a suggestion that the cellulase activity of certain bacteria on carboxymethylcellulose may occur in vivo and that this may contribute to the pathogenesis of toxic-shock syndrome.[3] Interestingly carboxymethylcellulose was not contained in the tampons used by our patients. Enterotoxin F is considered to be important in the aetiology of toxic-shock syndrome.[4] Examination of the *Staph aureus* isolates from our patients showed that they belonged to different enterotoxin-F-producing strains.

There have been reports from the United States of toxic-shock syndrome postpartum.[5] These cases were often associated with the use of tampons. Our case 4 was not associated with tampons and is the first reported case during the puerperium in Britain.

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Failure of rifampicin and co-trimoxazole in Q fever endocarditis

Information on the response of Q fever endocarditis to the newer antibiotics is slow to accumulate because of the rarity of the disease. Recently, the primacy of tetracycline in its treatment[1] has been challenged, at least in vitro, and by one clinical success with rifampicin,[2] and by co-trimoxazole as a potential first choice.[3] We report the complete failure of these and other antibiotics even to suppress *Coxiella burnetii* infection in a patient in whom tetracycline could not be used.

Case report

A male tannery worker aged 38 years was referred to this unit because of the recurrence of fever with embolic phenomena four weeks after a culture-negative endocarditis had apparently been successfully treated with penicillin and gentamicin. The underlying lesion was a discrete subvalvar aortic stenosis. Blood culture results again were negative but echocardiography showed massive highly mobile echoes in the aortic root; the complement-fixation test result for Q fever was positive at a titre of 1/320 (phase 1 and 2).

Although the initial response to tetracycline was favourable the drug had to be withdrawn after a week because of a severe pancreatitis and hepatic and renal failure. Treatment was continued with co-trimoxazole alone (960 mg three times daily). The immediate clinical response seemed very satisfactory, but after 10 months of continuous treatment there was relapse with fever, Osler's nodes, and a rise in Q fever titres to 1/640 (phase 1) and 1/5120 (phase 2). Lincomycin 2 g daily was added to his regimen with a dramatic initial response followed by relapse after one month of treatment. Rifampicin 600 mg daily was substituted for the lincomycin, the co-trimoxazole being continued throughout. The immediate clinical response was good, but since this seemed likely to be as delusory as the response to previous antibiotics a surgical exploration of the valve was undertaken after three weeks of rifampicin. The aortic valve was heavily infected, with a perforation of one cusp; vegetations were attached to the cusps and extended below to the subvalvar diaphragm. Both valve and diaphragm were excised and a disc-valve prosthesis inserted. The vegetations showed colonies of *C burnetii* on microscopy. Rifampicin and co-trimoxazole were continued during and after the operative period. Two months after operation he felt well but the Q fever titres remained high and a diastolic murmur not heard in the immediate postoperative period was present, suggesting a paraprosthetic leak.

Four months later he was readmitted with florid endocarditis and gross aortic reflux. There was no response to the addition of either lincomycin or erythromycin and he died three weeks later, after 16 months of continuous treatment with co-trimoxazole and five months with rifampicin and co-trimoxazole in combination. At necropsy there was extensive dehiscence of the prosthetic valve ring and many fresh vegetations composed microscopically of clumps of *C burnetii*.

Comment

That Q fever endocarditis can be intractable is well recognised and recurrence after valve replacement well known.[1 4] Nevertheless, good results are reported with tetracycline[1] even in the difficult field of prosthetic endocarditis,[5] though treatment may have to be continued for five years or more. Tetracycline could not be used in our patient, and the striking feature was the florid nature of the relapses occurring after an initial response to each of the antibiotics used. At operation and necropsy vegetation was luxuriant and *C burnetii* present in abundance despite prolonged and continuous treatment with co-trimoxazole, rifampicin, and lincomycin.

Where success has been reported with these drugs[1-3] they have been used in combination with or after treatment with tetracycline. We consider that there is still no acceptable substitute for tetracycline as the mainstay of treatment in Q fever endocarditis. Should circumstances arise again where tetracycline could not be used in a patient with Q fever endocarditis increased doses of rifampicin in the presence of normal liver function or even the use of chloramphenicol might be considered.

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Nitrofurantoin-induced parotitis

Nitrofurantoin is known to cause toxic and type III cell-mediated allergic reactions. The risk of these increases with age and they are more likely to occur in women than in men. Holmberg *et al*[1] divided the side effects of nitrofurantoin into six categories: (*a*) acute pulmonary reactions; (*b*) chronic pulmonary reactions; (*c*) allergic reactions, including various types of cutaneous manifestations (exanthema, erythema, urticaria), fever, and anaphylactic reactions; (*d*) liver damage and gastrointestinal disturbances; (*e*) blood dyscrasias; and (f) neuropathy.

We report a parotitis-like clinical condition induced by nitrofurantoin.

Case report

A 78-year-old woman was admitted with acute onset of bilateral painful swelling of the parotid gland, dry mouth, and fever of 39°C. She gave a history of arterial hypertension and moderate heart failure, for which she had taken regularly digoxin 0·25 mg, α-methyldopa 750 mg, and hydrochlorothiazide 100 mg daily. She denied taking any other medication. Recurrent urinary tract infections had responded to sulphonamides.

On admission she had a parotid swelling. Pulmonary auscultation indicated minor basal râles. Thoracic *x*-ray films showed an enlarged heart, pulmonary venous congestion, and interstitial extravasation. The only abnormal laboratory findings were a raised erythrocyte sedimentation rate (57 mm/first hour), moderate leucocytosis ($12{\cdot}4\times10^9$/l), and raised serum amylase activity (3533 U/l; normal range < 300 U/l). The fever, parotid swelling, leucocytosis, and raised serum amylase activity disappeared within two days; pulmonary auscultation showed no abnormalities. Hydrochlorothiazide was substituted by frusemide 80 mg daily. The patient had no history of mumps, and this was the diagnosis made on discharge four days after admission.

She was readmitted the next day with the same symptoms and signs as previously. Her original medication was continued and the parotid swelling and fever disappeared within 24 hours. Serum amylase activity was not increased. Chest *x*-ray films showed that the interstitial extravasation was slightly less. Her daughter reported that 13 days before the first episode of parotid swelling her mother had begun taking nitrofurantoin 50 mg twice daily for a urinary tract infection. Before the second episode of parotid swelling she had taken nitrofurantoin 50 mg six hours earlier.

Since swelling of the parotid gland due to nitrofurantoin has not to our knowledge been previously reported we decided to study a possible hypersensitivity to the drug by giving her 50 mg nitrofurantoin under observation. Four hours after taking the drug she complained of dry mouth, and prominent swelling of the parotid gland was evident. Estimations of blood eosinophils values, serum amylase, serum aspartate aminotransferase and serum alanine aminotransferase activity and autoimmune studies were performed just before the test and 24 hours later. The only abnormality was a leucocytosis of $7{\cdot}4\text{-}14{\cdot}0\times10^9$/l. The symptoms subsided within 24 hours. *X*-ray films were re-examined and signs of left ventricular failure due to an allergic reaction to nitrofurantoin were considered the most probable diagnosis.

Three weeks later all symptoms had disappeared and she continued taking her previous medication. Chest *x*-ray films showed no pulmonary venous congestion but only traces of interstitial infiltration of the lungs. There was no rise in viral antibody titre between acute and convalescent sera.

Comment

Parotid pain has been reported in patients treated with antihypertensive drugs, such as bretylium, clonidine, and guanacline.[2] Parotid swelling is rare, but may occur in patients receiving iodide compounds, usually as contrast media.[3] Our patient presented a clinical picture which was indistinguishable from epidemic parotitis with bilateral parotid swelling and fever. Similar reactions have been reported with α-methyldopa,[2] oxyphenbutazone, and phenylbutazone,[4] but only in a few sporadic cases. Xerostomia, transient leukocytosis, eosinophilia, and increased serum amylase activity may occur with parotid swelling.[4] All these features, except for the eosinophilia, were present in our patient.

The mechanism of swelling of the salivary gland is poorly understood. Oedema and spasm of smooth muscle in the salivary gland might be responsible.[2] Transient eosinophilia with sialadenitis due to oxyphenbutazone may be a sign of an allergic reaction.[4] A four-hour delay before the onset of symptoms and the associated pulmonary signs in the present case might indicate a type III hypersensitivity.

Several cases of drug-induced "mumps" have possibly been diagnosed as epidemic parotitis, since this condition can be excluded only by the absence of a rise in specific antibody. Recurrent parotid swelling is also a manifestation of Sjögren's syndrome, but patients with this condition also have recurrent arthritis, keratoconjunctivitis sicca, and laboratory findings suggesting an autoimmune disease. Some patients with recurrent swelling of the parotid gland have no signs of extraglandular effusion or history of drug treatment.[5] These patients do not have a fever, which may help in the differential diagnosis of a drug reaction. Recurrent parotitis combined with a fever can indicate the possibility of a drug-induced reaction.

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