Case 2—A girl aged 9 was taken into care on a place of safety order after her mother was thought to have burnt her deliberately on the buttocks with an electric iron. The mother was pregnant and had two other younger children. The girl had repeatedly played her mother up in the past after a long, early separation from her, and the family was well known to social workers. She showed her injury to her teacher, who contacted the police, and she was placed in an observation and assessment centre where one of us (PG) was teacher in charge. The mother was remanded in custody and the younger children were placed in children's homes. The girl gradually formed a trusting relationship in the classroom with her teachers and admitted that she had injured herself after being punished harshly. With her permission the teachers discussed this with her social worker. This was timely because the mother was about to be tried for grievous bodily harm; had she been convicted she would almost certainly have been sent to prison, so that the other children would have had to be taken into care. The girl remained in care with access to her family and was educated in a school for maladjusted children.

Comment

Many children who are rejected and ill treated start to feel worthless and try to punish themselves.[4 5] Psychodynamics explains this offence against self and society as a guilt reaction. Distinguishing between non-accidental injury that is self inflicted and that inflicted by others is not easy. In these cases hours of skilled conversation with the children were necessary to allow them to admit their secrets.

We have drawn attention to the concealment of self inflicted injury to show that parental abuse and overt self mutilation are not the only explanations of non-accidental injury. Although it is not common, this type of injury should be borne in mind in making the differential diagnosis to prevent possible miscarriages of justice.

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1 Roberton D, Barbor P, Hull D. Unusual injury: recent injury in normal children and children with suspected non-accidental injury. *Br Med J* 1982;**285**:1399.
2 Meadow R. Factitious illness: the hinterland of child abuse. In: *Recent advances in paediatrics. No. 7.* Edinburgh: Churchill Livingstone, 1984.
3 Oxtoby M, ed. *Taking a stand: child psychiatrists in custody, access and disputed adoption cases.* London: British Agencies for Adoption and Fostering, 1984.
4 Green A. Self-destructive behavior in battered children. *Am J Psychiatry* 1978; **135**:579.
5 de Young M. Self injurious behaviour in incest victims: a research note. *Child Welfare* 1982;**61**:577-84.

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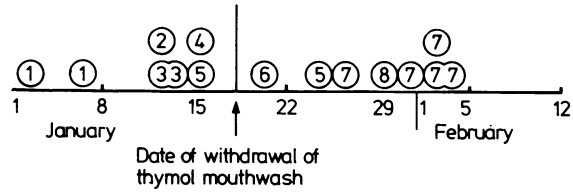
Outbreak of septicaemia due to contaminated mouthwash

Patients may become colonised with *Pseudomonas aeruginosa* in hospital, and medicaments used in wards are possible sources.[1] In immunocompromised patients colonisation is often associated with the development of septicaemia.[2] We report an outbreak of septicaemia due to *P aeruginosa* that occurred in an oncology ward and was caused by contaminated thymol mouthwash.

Patients, methods, and results

The outbreak affected eight out of 15 patients with leukaemia or lymphoma resident in a male oncology ward in the first six weeks of 1984. All eight patients had received cytotoxic chemotherapy before or during this outbreak.

Investigations began when we noticed a cluster of four cases (cases 2-5, figure). We concentrated on three possible sources common to all the patients with septicaemia—namely, indwelling Hickman catheters and two types of antiseptic mouthwash. On this ward hexetidine (Oraldene) mouthwash was given to patients complaining of sore mouths and thymol mouthwash was distributed to all patients after each meal. Cultures from the Hickman lines and hexetidine mouthwash were sterile, but, residual mouthwash in the two jugs used to distribute the thymol was macroscopically turbid and was shown to contain *P aeruginosa* at a concentration of $1{\cdot}0 \times 10^5$ organisms/ml after culture. These jugs were also used to make up the thymol mouthwash from tablets with tap water from two sinks in the ward. The jugs often remained half full for several hours between meals at room temperature. *P aeruginosa* was also cultured from swabs taken from both sinks and their taps in the ward. Similar swabs were taken from the female oncology ward, where thymol was made up individually for each patient, but no pseudomonas was grown. To investigate whether the water supply was contaminated samples of water from the tanks supplying the sinks in the male ward were cultured, but no *P aeruginosa* was grown. Cultures of the thymol tablets in use were sterile.



Patients in whom *Pseudomonas aeruginosa* was isolated from blood cultures during outbreak (case numbers shown within circles).

All strains of *P aeruginosa* isolated from the jugs and sinks had the same serotype and phage type as the blood culture isolates from seven of the patients with septicaemia. The patient with a different strain of *P aeruginosa* was nursed in a side room and was not given thymol from the communal jugs. The thymol mouthwash was immediately withdrawn when the initial results of culture were known. Three patients developed septicaemia after this, however (figure), and one died during the outbreak.

Comment

This is the first description of an outbreak of *P aeruginosa* septicaemia caused by contaminated mouthwash. The water supply itself appeared uncontaminated, but it is not clear how the epidemic strain of *P aeruginosa* became established in the sinks and jugs. Bacteria were probably transferred from the sinks to the jugs (and vice versa) when the mouthwash was made up. The practice of leaving the jugs half empty at room temperature between mouthwash rounds would allow the pseudomonas to multiply to the large concentration that was found.

The new cases of septicaemia that occurred after the thymol was withdrawn might be explained by preceding gastrointestinal colonisation by the pseudomonas strain followed by septicaemia (data to be published). Widespread use of antibiotics probably reduced the resistance of these patients to colonisation.[3] Once colonised, immunocompromised patients commonly develop septicaemia with *P aeruginosa*, probably as a result of diminished defences against invasion after cytotoxic chemotherapy.[2]

The low mortality in this outbreak is in contrast to that reported at other centres[4 5] and may partly have been due to the prompt use of antipseudomonal chemotherapy. Communal medications are an unneccessary hazard, particularly in oncology wards.

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1 Shooter RA, Cooke EM, Gaya H, *et al.* Food and medicaments as possible sources of hospital strains of Pseudomonas aeruginosa. *Lancet* 1969;i:1227-9.
2 Newman KA, Schimpff SC, Young VM, Wiernik PH. Lessons learned from surveillance cultures in patients with acute non-lymphocytic leukemia. Usefulness for epidemiologic, preventative and therapeutic research. *Am J Med* 1981;**70**:423-31.
3 Van der Waaij D, Berghuis JM, Lekkerkerk JEC. Colonisation resistance of the digestive tract of mice during systemic antibiotic treatment. *Journal of Hygiene (Cambridge)* 1972;**70**:605-10.
4 Singer C, Kaplan MH, Armstrong D. Bacteremia and fungemia complicating neoplastic disease. A study of 364 cases. *Am J Med* 1977;**62**:731-42.
5 Cross A, Allen JR, Burke J, *et al.* Nosocomial infections due to Pseudomonas aeruginosa: review of recent trends. *Rev Infect Dis* 1983;**5**:S837-45.

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