other factors that might influence uptake of rubella immunisation every girl in the control and intervention groups filled in a questionnaire, from which we established her age, family composition, and social class and discovered whether she had any knowledge about rubella and intended to accept immunisation. There was no significant difference between the control and intervention schools in any of these factors.

One hundred and seventy-nine girls (19%) had knowledge of rubella and 425 (45%) said that they intended to accept immunisation. The table shows the numbers of girls immunised in the control and intervention groups. An uptake of 93% was achieved overall in the intervention group compared with 75% in the control group. This difference is significant ($p < 0.001$). There was no significant difference between the girls immunised and not immunised as regards social class, family size and composition, or knowledge of rubella and intention to accept. Details are given elsewhere.²

Comment

The school health service can provide immunisation for every girl on a school roll, but uptake for rubella immunisation varies from 61% to 81%¹ in the United Kingdom. Methods other than health education have been used to obtain high levels of immunisation, among the most successful being the use of a computer³ and, in America, enforcing State legislation.⁴ Much of the health education to promote rubella immunisation is directed at adults and not school-girls. This study shows that simple health education produced at low cost and aimed at the girls who were to receive the immunisation produced an uptake of 95%.

In the school health service low acceptance rates are not usually due to parental refusal but to non-response. The girls who are offered immunisation are given an explanatory letter and consent form to take home to their parents and then have to return the letter to school. With this method an inadequate response rate is obtained unless the girls are motivated to return the form. The health education provided was effective in producing enthusiasm and interest in the girls that lasted long enough for them to make sure that parental consent was obtained and to appear in school on the day of immunisation. A tape-slide talk has been prepared based on the talk and slides used in this study and is being used in schools to promote the uptake of immunisation. The effectiveness of this talk is under investigation.

¹ Peckham CS, Marshall WC, Dudgeon JA. Rubella vaccination of school girls: factors affecting vaccine uptake. *Br Med J* 1977;i:760-1.

² Jones SAM. A controlled trial of health education to promote the uptake of rubella immunisation among first-year secondary schoolgirls. Part II MFCM thesis. London: Faculty of Community Medicine, 1980.

³ Bussey AL, Holmer BS. Immunisation levels and the computer. *Lancet* 1978;ii:450.

⁴ Middough JP, Zyla LD. Enforcement of school immunisation law in Alaska. *JAMA* 1978;239:2128-30.

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Povidone-iodine antiseptics for transrectal prostatic biopsy

Transrectal prostatic biopsy with the Tru-cut needle permits easier and more accurate histological sampling of suspicious nodules than the perineal and resectoscope methods. While Schulman reported one case of mild urethral damage as the only complication in 50 transrectal biopsies with the Tru-cut needle,¹ serious septic complications can arise. We showed² by blood culture that 16 out of 21 patients (76%) had bacteraemia five minutes after transrectal biopsy. Then topical antiseptics was only swabbing with cetrimide. The absence of serious septic complications was probably due to a short course of antibiotic. Others subsequently reported a similar incidence of bacteraemia,³ but anaerobic organisms were not a feature, though we had isolated them more often than aerobic organisms.² We prescribed metronidazole because of previous experience of septic shock associated with anaerobic organisms, which had been noted by others.^{4 5}

The question arose whether more effective local antiseptics would enhance the safety of transrectal biopsy by reducing contamination and in particular the incidence of bacteraemia, whose rapid onset was probably due to direct inoculation into prostatic veins. We carried out a study to investigate this.

Patients, methods, and results

We studied all 31 patients who underwent transrectal prostatic biopsy at this hospital over a 16-month period. Ages ranged from 55 to 95 (mean 77) years. Carcinoma was confirmed in 16 patients and prostatitis in another, the remainder showing only benign hypertrophy. Eight already receiving antibiotic treatment were excluded, leaving 23 patients.

Shortly before biopsy a phosphate enema was administered to avoid bacteria in the centre of solid faecal particles being shielded from the povidone-iodine. The rectum was then washed well with a 10% solution of povidone-iodine (Betadine) applied with cotton-wool on sponge-holding forceps passed through a proctoscope. Two biopsy specimens were taken from each gland with a Tru-cut needle, blood for culture was withdrawn five minutes later, and a course of six doses eight-hourly of oral ampicillin 500 mg and metronidazole 400 mg prescribed. Three or four days later blood and mid-stream urine samples were taken for culture. Laboratory methods were as before.²

Of 23 blood samples taken five minutes after biopsy, four (17%) yielded organisms on culture. Of these, two (enterococcus and non-haemolytic streptococcus) were aerobic and sensitive to ampicillin and two (*Clostridium perfringens* and *Bacteroides fragilis*) were anaerobic and sensitive to metronidazole. All blood and urine samples taken on day 3 or 4 were sterile. One patient with a small malignant gland developed haematuria and clot retention, and one whose blood cultures were both negative had a brief shivering attack six hours after biopsy, but no other complications were noted.

Comment

In our first series, when rectal antiseptics was less thorough, the incidence of bacteraemia five minutes after biopsy was 76%, compared with 17% in this study (< 0.001 ; χ^2 test with Yates's correction for small numbers). We doubt that the phosphate enema alone would reduce the incidence of contamination at biopsy, as faecal flora would still be present, and attribute the appreciable reduction in bacteraemia to the povidone-iodine antiseptics.

These local antiseptic precautions seem worth while. With the large reduction in organisms contamination is likely to be considerably reduced even when blood cultures are positive. The risk of inoculation of resistant organisms is reduced. Patients may fail to take their medication. Factors increasing the danger of the septic shock that may otherwise develop include advanced age, diabetes, malignancy, and immune deficiencies, and risk of bacterial endocarditis exists in those with valvular heart disease. In our combined series of 44 patients no serious complications arose. Even with topical and systemic antiseptics we would still advocate taking blood for culture five minutes after biopsy in case septic problems should arise.

Thus with the antimicrobial precautions described transrectal prostatic biopsy is a safe and simple outpatient procedure even in the elderly.

We wish to thank Mr R P M Miles and Mr W F P Gammie for allowing us to include their patients in this study.

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² Ashby EC, Rees M, Dowding CH. Prophylaxis against systemic infection after transrectal biopsy for suspected prostatic carcinoma. *Br Med J* 1978;iii:1263-4.

³ Thompson PM, Talbot RW, Packham DA, Dulake C. Transrectal biopsy of the prostate and bacteraemia. *Br J Surg* 1980;67:127-8.

⁴ Harris LF, Jackson RT, Breslin JA, Alford RH. Anaerobic septicaemia after transrectal prostatic biopsy. *Arch Intern Med* 1978;138:393-5.

⁵ Breslin JA, Turner BI, Faber RB, Rhamy RK. Anaerobic infection as a consequence of transrectal prostatic biopsy. *J Urol* 1978;120:502-3.

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