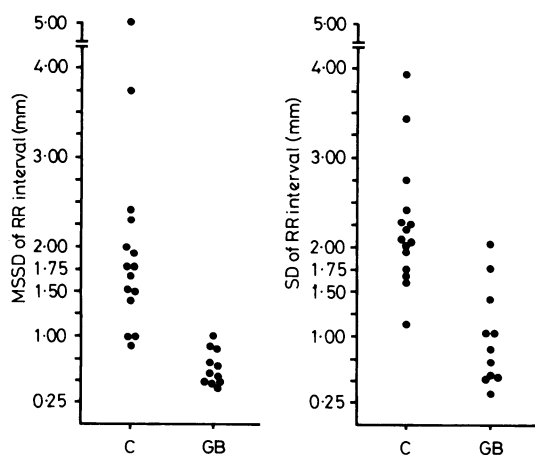


Heart rate variations in the Guillain-Barré syndrome

Measuring heart rate variations is an easy and reproducible method of evaluating autonomic nervous system disturbance and has been used to study autonomic disturbance in patients with diabetes,¹ multiple sclerosis,² and rheumatoid arthritis.³ We studied the beat-to-beat variation in a series of tetraplegic patients⁴ and concluded that it might be an easy test for evaluating autonomic disturbance in other diseases such as the Guillain-Barré syndrome. We have now done this and report our results here.

Patients, methods, and results

We studied 11 patients (six men, five women; aged 7-50, two under 20, and mean age 33.3) with the Guillain-Barré syndrome admitted to our intensive care unit because of severe respiratory failure, and all of whom needed mechanical ventilation. Some were given antibiotics and corticosteroids but none received any drug which might have depressed heart rate variability. In all these patients as well as in 15 controls in good health (7 women, 8 men; aged 18-46, one under 20, and mean age 30.2) we recorded an electrocardiograph over three minutes with a paper speed of 50 mm/sec. We then measured the length in millimetres of at least 150 consecutive R-R intervals. For both groups the mean square successive difference (MSSD) and the usual standard deviation (SD) of the successive R-R intervals were calculated. These statistical analyses were used by Neubauer and Gundersen²: the MSSD is the standard deviation of the differences between any R-R interval and the next. The MSSD and SD figures were respectively 1.78 and 2.11 for the controls and 0.58 and 0.84 for the patients: a significant difference ($p < 0.0001$). The figure shows the individual MSSD and SD in controls and patients.



Individual mean square successive difference (MSSD) and standard deviation (SD) of successive R-R intervals in control group (C) and in patients with the Guillain-Barré syndrome (GB).

In three patients the MSSD and the SD of successive R-R intervals returned to normal when respiratory function had improved, although neurological deficit persisted, and mechanical ventilation was no longer necessary. These three had MSSD and SD values of 0.50, 0.62, and 0.90, and 0.65, 1.05, and 1.40 respectively while in the intensive care unit, and later, when the autonomic disturbance had recovered, of 1.60, 1.65, and 1.77, and 1.78, 1.90, and 2.25 respectively. Five of the other patients died and the last three could not be followed up.

While in the intensive care unit four patients had 36 episodes of asystole not related to respiratory disturbance, myocardial infarction, or history of previous arrhythmias. All these episodes were successfully treated, with sinus rhythm and adequate cardiac output being restored promptly.

Comment

Autonomic nervous system disturbance is a common feature in many diseases including the Guillain-Barré syndrome. Measuring heart rate variation in these patients is an easy and useful way to evaluate cardiac denervation. Autonomic neuropathy has been considered a sign of poor prognosis in diabetic patients because of the higher frequency of cardiorespiratory arrests especially in circumstances that interfere with respiration such as anaesthesia, broncho-

pneumonia, or giving certain drugs. We have observed that in some patients with the Guillain-Barré syndrome and respiratory failure treated with mechanical ventilation, the frequency of cardiac arrests was high and related on many occasions to postural changes or endotracheal suction. Autonomic disturbances are likely to make a large contribution to mortality in the Guillain-Barré syndrome, and patients suffering from this disease must be put in a high-risk category until the autonomic neuropathy has recovered.

Edmonds and Stunock⁵ reported a case of the Guillain-Barré syndrome in which serial tests on heart rate variation showed the disappearance of the autonomic disorder.⁵ The same improvement occurred in three of our patients.

¹ Wheeler T, Watkins PJ. Cardiac denervation in diabetes. *Br Med J* 1973; iv:584-6.

² Neubauer B, Gundersen HJC. Analyses of heart rate variations in patients with multiple sclerosis. *J Neurol Neurosurg Psych* 1978;41:417-9.

³ Edmonds ME, Jones TC, Saunders WA, Sturrock RD. Autonomic neuropathy in rheumatoid arthritis. *Br Med J* 1979;ii:173-5.

⁴ Frisón JC, Sanchez L, Garnacho A, Gimeno V. Heart rate variation in tetraplegic patients. *Br Med J* 1979;ii:1353-4.

⁵ Edmonds ME, Sturrock RD. Autonomic neuropathy in the Guillain-Barré syndrome. *Br Med J* 1979;ii:668.

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Intensive Care Service, Ciudad Sanitaria de la Seguridad Social, Barcelona, Spain

J C FRISÓN, MD, medical assistant
L SANCHEZ, MD, medical assistant
A GARNACHO, MD, medical assistant
J BOFILL, MD, chief clinician
R OLIVERÓ, MD, medical assistant
C MIQUEL, MD, medical assistant

Health education to improve rubella immunisation in schools

Since the policy in the United Kingdom is to immunise against rubella only girls and women of childbearing age, it is important to obtain immunisation levels of 100% to prevent rubella syndrome.¹ Efforts have been made recently to improve uptake throughout the country. A controlled trial of health education was carried out to promote the uptake of rubella immunisation.

Methods and results

Nine hundred and forty-four schoolgirls aged 11 to 12, in their first year at seven Inner London comprehensive schools in the King's Health District, entered the study. The schools were divided into control and intervention

Uptake of immunisation according to type of intervention. (Figures are numbers (%) of girls*)

	Talk alone	Talk + discussion	Control	Total
Immunised ..	271 (95.1)	350 (91.6)	204 (75.6)	825
Not immunised ..	14 (4.9)	32 (8.4)	66 (24.4)	112
Total ..	285 (100.0)	382 (100.0)	270 (100.0)	937

*Immunisation state was unknown for seven girls.
Difference between talk alone and talk plus discussion: $\chi^2 = 1.86$, $df = 1$; NS.
Difference between control and intervention groups: $\chi^2 = 56.24$, $df = 1$; $p < 0.001$.
Overall: $\chi^2 = 58.10$, $df = 2$; $p < 0.001$.

groups by an independent observer with no knowledge of the schools or the district. The intervention group was further divided: one group received health education consisting of a short talk about rubella illustrated with five 35 mm slides showing rubella-damaged babies and one normal baby, while the other group received the same talk and slides followed a few days later by an informal discussion about rubella with girls who were thought to have influence with their friends. No special health education was given to the control group, but the normal procedure for rubella immunisation used by the school health service was carried out. To identify

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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South-west Thames Regional Health Authority

S A M JONES, MFCM, senior registrar in community medicine

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.

¹ Schulman CC. Transrectal prostatic biopsy. *Int Urol Nephrol* 1970;2:157-61.

² Ashby EC, Rees M, Dowding CH. Prophylaxis against systemic infection after transrectal biopsy for suspected prostatic carcinoma. *Br Med J* 1978;ii: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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St Richard's Hospital, Chichester, West Sussex PO19 4SE

M REES, FRCS, surgical registrar (present appointment: surgical registrar, St George's Hospital, London SW17)

E C ASHBY, MCHIR, FRCS, consultant surgeon

R D POCOCK, FRCS, surgical registrar (present appointment: surgical registrar, St James's Hospital, London SW12 8HW)

C H DOWDING, FIMLS, chief medical laboratory scientific officer in microbiology