GUEST EDITORIAL

The prevention of tetanus: which direction for improvement?

Statistical analysis of the incidence of rarities has many traps. One or two unusual cases easily distort the overall impression and an individual's practice may be permanently altered by a single case with which he or she has been involved.

The rarity of tetanus in the United Kingdom (P.H.L.S., 1985) is reasonably attributed to improvements in general hygiene and wound care, together with widespread use of active immunization against the disease (both in routine programmes for infants and children, and following injury). Sadly, tetanus is much more familiar in many other parts of the world, but the relative importance of better surgical care of the wounded and of immunological preventive measures is still not known and is hardly susceptible to evaluation. Their introduction was parallel. The value of both types of prophylaxis seems too definite for it to be acceptable to think of abandoning one experimentally to see how the other works alone.

The introduction of a safe form of passive immunization, Human Antitetanus Immunoglobulin (Rubbo, 1966; Anon., 1974), further complicated the picture. With tetanus occurring in this country as frequently in apparently trivial wounds as in ones classically tetanus-prone (Atrakchi & Wilson, 1977), it might be thought logical to offer this preparation to anyone with a wound who had not previously been actively immunized with an effective course of tetanus vaccine. Some large accident and emergency departments have adopted this policy and have used very substantial quantities of specific human immunoglobulin. In one department, this generous policy was applied after tetanus developed in a single patient whose wound had been treated by surgical toilet alone because it appeared trivial.

In a survey which the author carried out to study preventive measures against tetanus in the larger accident and emergency departments in the United Kingdom (Marrow, 1985), 11 out of the 126 departments that responded indicated that they offered passive immunization to all, or almost all, wounded patients not already actively immunized against tetanus. In the year of the survey, 1984, new patients treated in those 11 departments only amounted to about 5% of the new accident and emergency patients throughout the country, but approximately one third of the Antitetanus Immunoglobulin used in the United Kingdom (17 419 of a total of about 50 000 doses supplied) was used in them.

Between 25 and 50 cases of tetanus still occur each year in the United Kingdom (P.H.L.S., 1985), each a grave threat to a patient's life, with treatment generally becoming more costly as its effectiveness improves (Edmondson & Flowers, 1979). These cases occur in the context of some 12 million new accident and emergency patients in the United Kingdom in 1984, of whom it may be estimated between three and five million had wounds of some kind. However, a significant proportion of patients

with tetanus have not sought medical treatment for their wounds until the disease develops. Some cases still occur after surgical rather than accidental trauma (P.H.L.S., 1985). There is no clear history of wounding at all in some cases (Atrakchi & Wilson, 1977).

When those with untreated wounds, post-operative cases and those with no detectable wound are excluded it will be seen that the 'pool' of cases of tetanus whose wounds actually slipped through the preventive net of one of our accident and emergency departments is probably very small indeed.

There is no practical way of showing whether or not there is a significant difference between the incidence of tetanus amongst patients whose wounds were treated in high Immunoglobulin-use departments and those cared for in ones where little or none is used (in my survey, nine responding departments used none at all and four more used less than one dose for every 10 000 new patients treated). There are only finite amounts of human plasma suitable for the production of Antitetanus Immunoglobulin. For example, the 35 000 doses produced annually by the National Blood Transfusion Service in England consumes almost all the hyperimmune plasma which the Service receives (National Blood Transfusion Service, 1985).

Even if it could be demonstrated that very generous use of the preparation did reduce the incidence of tetanus still further, it is very unlikely that supplies of Antitetanus Immunoglobulin could meet the demand if such use became general throughout the country, let alone throughout the world. There will be an appreciable loss of other benefits in consequence both of the financial cost of manufacture and of the diversion of blood products to Antitetanus Immunoglobulin production if usage increases significantly above even its present level.

The mainstays of the preventive policy (D.H.S.S., 1984; Smith *et al.*, 1975; U.S.P.H.S., 1977) must remain proper surgical care of wounds together with active immunization as widespread as it can be in the population, young and old. Only by the latter method can tetanus be prevented following all those trivial injuries which would not merit medical attention were it not for the risk of tetanus. The current policies were essentially formulated in the days when the only way of giving passive protection to a patient whose wound seemed particularly at risk from tetanus was to give specific Antitetanus Serum, but this was from an equine, not human source. It is proper that the role of passive immunisation should be reconsidered now that there is a far safer human preparation available.

The classical criteria of proneness to tetanus (Smith *et al.*, 1975) are sound guidelines, but their interpretation and application varies widely. There is a huge range in the rate of use of Human Antitetanus Immunoglobulin between departments apparently all following the practice of only giving Immunoglobulin to non-immune subjects with 'tetanus-prone' wounds (from zero to 53.3 doses per 1000 new patients; mean, 5.46 S.D., 9.59). *Clostridium tetani* is still widespread and a patient with a contaminated wound, one with tissue damage or deep penetration, or a wound which has been neglected for more than 6 h, is still at real risk from tetanus if they have not completed a course of active immunisation. Safe passive immunisation should be readily available for them.

The classical criteria do not take note of risk factors relating to the patient or to what they were doing at the time of injury, only to features of the wound itself, in isolation.

Farming, gardening and rural sports should be regarded as additional risk factors. Special attention should be directed to those who by reason of age, sex or country of origin are not likely to have received routine immunisation either in childhood or during military service (those over 40 and immigrants to the United Kingdom from the Third World are examples). Because of immunisation routines in the armed forces, older women are less likely than men to have been protected against tetanus.

The policy put forward by Smith, Laurence & Evans in 1975 is still used by more departments than any other (57 of the 126 respondents to this survey). Application seems to be varied with wide ranges of usage of tetanus vaccine, as well as Immunoglobulin. The policy gives clear direction to the relatively inexperienced doctors who usually decide which 'tetanus injections' are needed. Identification of the 'tetanus-prone wound' may not always be clear cut, however, and descriptive features to guide judgement could be helpful amplifications of the policy to make sure that patients who really are at risk of the major disaster of tetanus can be protected by passive immunisation, while avoiding waste of a limited and costly resource.

REFERENCES

- Anonymous (1974) Human antitoxin for tetanus prophylaxis. *Lancet* **i**, 51.
- Atrakchi S. A. & Wilson D. H. (1977) Who is likely to get tetanus? *British Medical Journal* **1**, 179.
- Edmondson R. S. & Flowers M. W. (1979) Intensive care in tetanus management, complications and mortality in 100 cases. *British Medical Journal* **1**, 1401-4.
- Joint Committee on Vaccination and Immunisation (1984) *Immunisation against infectious disease*, pp. 17-23. Department of Health and Social Security, London.
- Marrow J. (1985) Prevention of tetanus in accident and emergency departments in the United Kingdom. Casualty Surgeons' Association Annual Meeting.
- Ministry of Health (1964) Protection against tetanus. *British Medical Journal* **2**, 243.
- National Blood Transfusion Service (1985) Personal communication.
- Public Health Laboratory Service, Communicable Disease Surveillance Centre (1985) Tetanus surveillance: England and Wales, 1981-83. *British Medical Journal* **290**, 696-7.
- Rubbo S. D. (1966) New approaches to tetanus prophylaxis. *Lancet* **2**, 449-53.
- Sharrard W. J. W. (1965) Tetanus prophylaxis. *Proceedings of the Royal Society of Medicine* **58**, 221-4.
- Smith J. W. G., Laurence D. R. & Evans D. G. (1975) Prevention of tetanus in the wounded. *British Medical Journal* **3**, 453-5.
- United States Public Health Service Advisory Committee on Immunization Practices (1977) *Morbidity and Mortality Weekly Report* **26**, 49.

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