ABSTRACTS

PARENTERAL PENICILLIN AND MENINGOCOCCAL DISEASE

In 1991 I was a GP trainee in a practice just outside Aberdeen in Scotland. We had recently received guidelines that meant that we had to carry benzyl penicillin in our emergency bags to use before hospital admission in children we suspected of having meningococcal disease. This reflected that potential of the disease to cause severe illness and death within hours.

I was on call one night when a mother phoned saying that her young son, who had been put on antibiotics earlier that day by one of the practice partners, had developed a rash. It would have been so easy to have told her to discontinue the antibiotics and bring her son in the next morning. Fortunately, I went to the home, immediately diagnosed meningococcal disease from the purpuric rash and from the boy's general condition, and dutifully gave him penicillin IV while waiting for the ambulance to arrive. He apparently had two convulsions in the ambulance and was losing consciousness by the time he arrived in Aberdeen. But, he recovered well and I remember thinking how pleased I was that we had penicillin available.

These guidelines are now some years old and Anthony Harden and colleagues have published a study in the *British Medical Journal* that suggests that this intervention has not had the desired effect. There have apparently been observational studies that have given conflicting results. One study, published in 1992, reported a 40% reduction in case fatalities in children given parenteral penicillin before admission. However, 2 more studies from Denmark have reported a two- or three-fold increase in mortality associated with antibiotics given before admission.

The objectives of this study were to explore the impact on mortality and morbidity of parenteral penicillin given to children before admission to hospital with suspected meningococcal disease. They used a retrospective analysis of fatal and non-fatal cases in England, Wales and Northern Ireland from December 1997 to February 1999. Their study included 158 children aged 0 - 16 years in whom a general practitioner had made a diagnosis of meningococcal disease before admission to hospital. Of these children, 26 died and 132 survived.

Parenteral penicillin was given to 105 children and not given to 47 children. The most common reason for not giving penicillin was uncertainty about the diagnosis, mainly because the rash was not haemorrhagic. Other reasons included penicillin allergy and to avoid delay in hospital admission. Penicillin given before admission was associated with a seven-fold increase in risk of death. Fifty-seven children who survived experienced complications and the children who had received penicillin had a higher rate of complications, as did those with a particular serogroup of meningococcus and those rated by the GP as having severe disease. Children who had received penicillin were rated by the hospital as having more severe disease on arrival than those who did not have penicillin.

These data confirm results from previous studies that have shown that children given penicillin in the community have a poor outcome. The most likely explanation for this is that those children who were given penicillin before admission were severely ill. An alternative explanation is that giving penicillin precipitates shock by liberating endotoxin during bacteriolysis before the child reaches hospital. However, this study found no evidence that the severity of the disease on admission was linked to the time taken to reach hospital, which would be expected if shock were a cause of increased mortality and morbidity.

The authors conclude that further studies are needed before making any changes to current guidelines.

Harden A, *et al. BMJ* 2006; published online 24 March.

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