Prolonged Fever in Bacterial Meningitis

Fever is one of the major and most constant presenting signs in acute bacterial meningitis, except in the newborn. The organisms most commonly causing acute meningitis are the meningococcus, the pneumococcus, and *Haemophilus influenzae*. Between them they are responsible for well over 80% of cases in patients who are free of congenital anomalies of the central nervous system and have had no surgical treatment. The adequate treatment of patients with these infections results in the return of the temperature to normal in over half of the cases by the fourth day and in almost all by the sixth day.[1]

Fever may persist rather longer than expected in some patients who are otherwise doing well, or it may recur during treatment after defervescence without other evidence that the meningitis has become active again. Such prolonged fever may be mistakenly taken as an indication either to go on with the treatment or to change the antibiotic drug being given or to add other drugs to that already in use. It may also tempt the physician to carry out further unnecessary and perhaps dangerous investigations to find out the cause. In fact, however, provided the patient does not suffer from congenital malformations of the central nervous system, the correct choice of antibiotic and its administration in the right dosage and by the right route will give an excellent prognosis in acute meningitis except in newborn babies,[2] particularly when the illness is due to the common infecting agents. The duration of treatment need not be long in such infections, particularly in meningococcal meningitis. An average of 10 days[3] in all the usual forms is certainly enough and may be too long.

The commonest cause of prolonged or recurrent fever is too long therapy. This is evident from a recent report by R. C. Balagtas and his colleagues.[1] In a large series of 1,073 cases 38% developed secondary fever and 10% had prolonged fever. These authors studied in detail the causes of such delayed or persistent fever in a series of 90 patients, consisting mostly of children. There were no newborn babies in the series. Only two of the patients died, both on the first day of life. The authors' treatment regimen for *Haemophilus influenzae* infection or for those patients without a known organism consisted of systemic ampicillin in large doses (200-300 mg/kg body weight daily). For meningococcal or pneumococcal infections they used penicillin, 3-20 million units daily, the dosage depending on age. Intrathecal injections were not given, but a feature of their treatment was the prolonged use of continuous intravenous therapy in 84 patients. Fever subsided in the majority of patients by the fourth day, but 25 (28%) developed a secondary fever. In none of these nor in eight others whose fever persisted beyond 10 days was the fever due either to recurrence or to relapse of the meningitis. The cerebrospinal fluid was sterile, and the cellular and biochemical values had improved in all. The patients were not ill as a rule. In half of them the fever was attributed to phlebitis, and the temperature promptly subsided on removing the intravenous catheter. In six of the 35 the drug was responsible for the recurrent or prolonged fever, which subsided on stopping it. In others no definite cause was found for secondary fever of brief duration. In two children another and unconnected infection was found to be causing the prolonged fever.

In most of these cases the secondary fever seems to have been in some way iatrogenic in origin. In Britain prolonged intravenous therapy is not considered to be indicated, and hence fever due to phlebitis is much less common, but drug fever due to too long treatment is sometimes seen and is not confined to patients treated with penicillin or its derivatives. Sulphonamides, which are often and correctly used for the treatment of meningococcal meningitis, readily cause drug fever, as do many other excellent antibiotic drugs.

It is therefore worth remembering that provided the patient does not have an obvious congenital defect and provided no foreign body (or prosthesis such as a Holter shunt) is present, secondary or prolonged fever is almost never due to failure of correctly used antibiotics. If in spite of the fever the cerebrospinal fluid is sterile and shows a reassuring improvement, and if the patient is not ill, it is safe to discontinue therapy with good expectation that the fever will quickly subside. It is a mistake in these circumstances to prolong treatment or to increase the dose or to change to another antibiotic drug. It is also unwise to employ a multiplicity of drugs when one suffices. To do so may lead to an increase in adverse drug reactions.[4]

If, however, the patient is ill in addition to being feverish then certain relatively rare complications of the meningitis should be looked for and treated. They include infected subdural effusion, cerebral abscess, and mastoiditis. Intercurrent infections unconnected with treatment should also be borne in mind.

[1] Balagtas, R. C., Levin, S., Nelson, K. E., and Gotoff, S. P., *Journal of Pediatrics*, 1970, 77, 957.
[2] *British Medical Journal*, 1970, **4**, 318.
[3] Fleming, P. C., *Antimicrobial Agents Chemotherapy*, 1967, p. 188.
[4] Wightman, K. J. R., *Canadian Medical Association Journal*, 1965, **93**, 870.

Aberystwyth Meeting

After a winter of discontent such as this many doctors will be looking forward to the spring with more than usual pleasure. One way to start the Easter holidays is offered by the B.M.A. Clinical Meeting, held this year at Aberystwyth. The programme (*Supplement*, p. 51) includes a symposium arranged by the British Association of Manipulative Medicine, and the wide range of other subjects covered includes colonic disease, medical hazards of farm workers, the patient's part in healing, and sessions on the eye in general practice, leukaemia, dermatology, paediatric urology, hyperbaric oxygen, and postgraduate education in general practice. Professor Michael Swann will deliver the opening address. On Friday evening the B.B.C. Welsh Orchestra will give a concert.

A seaside setting is always an added advantage on these occasions, and with Snowdonia within easy driving distance the meeting offers the careworn doctor a real chance to refresh himself physically as well as mentally.

In view of the present limited circulation of the *B.M.J.* occasioned by the postal strike the size of the journal is being temporarily reduced. Cuts are being made mainly in the amount of teaching material published, but reports of original work will not be held up. As soon as the strike is over the *B.M.J.* will return to its former size, and back issues will be distributed as quickly as possible. In the meantime manuscripts, letters for publication, and proofs may be handed in at any B.M.A. Regional Office.