
Preventing casualty wound infection

Habits die hard and none will die harder than the antibiotic cover prescribed by casualty officers for minor injuries. It could be argued that antibiotic cover is also casualty officer cover, for the casualty officer might appear to have erred on the side of safety. But chemoprophylaxis in surgical patients is a very controversial subject even for several well-defined clinical situations where it might be thought that there should be some agreement (Garrod, 1975).

Most reports concerning wounds, and especially two major studies of some 40,000 wounds, are concerned with operative wound infection (Report, 1964; Cruse & Foord, 1973). In contrast, the minor wound so often seen in casualty departments has attracted much less attention. In a recent study, minor non-contaminated wounds, less than 4 h old and requiring suture, were randomly allocated to one of three treatment groups: an intramuscular injection of 1.25 meganits of penicillin as a long-acting depot preparation, local wound irrigation with 100 mg of tetracycline in solution, or no antibiotics (Day, 1975). The findings showed an increased incidence of infections in both of the antibiotic treated groups. The author emphasizes that while the unavoidable delay in giving antibiotics in his series is probably sufficient to allow a viable inoculum to become established in the wound, there seemed to be no such easy explanation for the increased number of infections in the antibiotic treated group.

Nevertheless, the casualty officer must continue to assess more extensive wounds in the usual manner: applying the surgical principles of wound toilet and débridement and preventing gas gangrene by adequate penicillin. But he might well ponder over the place of short-term high dose antibiotic cover vis-à-vis a good solid course of treatment. Here again, most of the studies with short-term cover have been designed to give prophylaxis for the operative and post-operative period (Evans & Pollock, 1973; Stokes, Waterworth, Franks, Watson & Clark, 1974) and none has been carried out in the form of a trial for the larger casualty wounds.

The place of topical antibiotics and poovidence–iodine powder has been well established for the operative wound (Ryan, 1967; Gilmore & Sanderson, 1975) and the experimental wound (Casten, Nach & Spinzia, 1964; Glotzer, Goodman & Lippman, 1970) but not for the casualty wound. One thing is certain, the serum concentration of a systemic antibiotic can never match the very high level obtained with topical instillation. At best, the concentration in a wound of penicillin or ampicillin after systemic injection may equilibrate with the serum concentration (Alexander, 1975) though cephaloridine reaches only 40-50% of the simultaneous serum concentration (Folk & Lopez-Mayor, 1969). At worst, the tissue fluid concentration may never reach effective levels because either the serum peak is low or the rapidity of the rise and fall of the serum peak never allows an adequate time for equilibration (Chisholm, Waterworth, Calnan & Garrod, 1973). Alexander & Altemeier (1965) showed that larger doses of penicillin were more effective in preventing infections than smaller doses thus supporting the view that the penetration into tissue fluid and wound fluid is related to the serum level. In general, there is every reason to emphasize the need for fully effective dosages whatever the antibiotic. Thus, in a seriously contaminated wound both full systemic dosage and liberal topical instillation after wound toilet must be regarded as prudent.

However, the casualty officer must now reconsider the routine use of antibiotic cover for minor accidental wounds. Day's conclusions deserve to be drawn to the attention of surgeons in charge of casualty departments.

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References