Leading Articles

Change of Editor

This issue of the Journal of Antimicrobial Chemotherapy is the first to appear with Professor J. D. Williams no longer leader of its editorial team. His enthusiasm was largely responsible for the founding of the Journal in the face of much doubt and pessimism, and this same enthusiasm has been his major contribution, as first editor, to its establishment and success. Members of the British Society for Antimicrobial Chemotherapy, and indeed all its readers, owe him a considerable debt of gratitude.

The new editorial team has been presented with two problems. The first concerns the question of the style of the Journal. It has generally been felt that we do not wish to impose a rigid house style, but that more detailed guidance to authors is desirable. A new section of the journal will thus appear in the first issue of each volume, giving such guidance. It is hoped that this will result in greater clarity, and ease some of the burden on the editors.

The second problem is perhaps more pressing. The delay between the acceptance of a paper and its final appearance in print has been increasing and has occasionally been longer than one year. Raising the number of papers rejected has not solved the problem and a number of new measures have thus been taken. Most important, the Journal will have slightly more pages each year and will be produced monthly. We hope to include two Leading Articles per issue and to have Reviews and Book Reviews in alternate issues. Next, short papers of 1000 words, with one table or figure and up to five references will be accepted for rapid publication: authors are encouraged to use this section in which the format will be that of a short but standard paper. Correspondence columns will be used largely for the discussion of papers published in the Journal or elsewhere, or of other matters of current interest, but not primarily for the publication of new material. Finally reviewing and editorial arrangements have changed somewhat in the interest of more rapid publication. It will be some months before the backlog of accepted papers has been cleared, and in the meantime authors are asked not to abandon us.

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Multiple antimicrobial drug resistance in enteric pathogens

Plasmid-encoded antimicrobial drug resistance is now prevalent in enteric pathogens in many countries. The problem exists in both developed and developing countries although the ecological basis is different. To understand this problem, study of the epidemiology of both the pathogens and the plasmids is required.

Food-borne salmonellosis is an important cause of diarrhoeal disease in Northern Europe and in most countries Salmonella typhimurium is the predominant serotype. Bovine animals and poultry are the main sources of Salm. typhimurium in Britain and it is significant that the bovine-associated phage types have a high incidence of multiple drug resistance, whereas multiple drug resistance in the poultry-types is rare. Salmonellosis in cattle, especially calves, is commonly a severe disease and is an important economic factor for the cattle-rearing industry. In contrast, salmonellosis is not an economic disease in poultry. Antibiotics are widely used in treatment and prophylaxis of salmonellosis in calves although the use of these substances as growth-promoting additives is prohibited in Britain. The organization of the calf trade involves extensive movement of young animals and during the associated period of stress, salmonella scours frequently develop. Cross-infection in dealers' premises facilitates the spread and maintenance of strains. As a result of these practices, clones of multiply resistant Salm. typhimurium such as those of phages-types 29, 204 and 193 have become disseminated in herds throughout the country,
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entered the human food chain and become significant causes of human infection (Anderson, 1968; Threlfall, Ward & Rowe, 1978a, b). The importance of cross-infection in the spread of these clones in calves is obvious and any measures to reduce such cross-infection are to be encouraged. We doubt whether such measures as can be practically feasible on farms or dealers' premises would be successful when it is so difficult to secure effective isolation of infected humans, even in hospitals. Probably the most valuable measure would be reorganization of the calf trade to eliminate the dealers who hold and mix animals on premises which are often unhygienic. However important these measures could be, it must be remembered that it is the use of antibiotics which has provided the milieu conducive to the appearance and spread of multiply-resistant strains. Control of the unnecessary use of antibiotics is essential and this may involve more stringent implementation of existing legislation to reduce illicit farm-yard use. In addition, better definition of guidelines for prophylaxis would be useful for the veterinary profession.

In the last 10 years, multiply-resistant salmonella of different serotypes have caused many outbreaks of salmonellosis in developing countries of all the major continents. These outbreaks have been characterized by their severity of infection, frequently with a high incidence of septicaemia with associated mortality. Examples of such outbreaks were those caused by a multiresistant clone of S. wien which has become disseminated throughout southern Europe and has caused many infections in paediatric units between 1970 and 1979 (McConnell et al., 1979). Similar patterns have been seen with the spread of a clone of Salm. typhimurium phage type 208 in the Middle East since 1969 (Threlfall, Carr & Anderson, 1976; Anderson et al., 1977) and a clone of phage type 66/122 in Asia and the Middle East since 1978 (Rowe et al., 1980). In these outbreaks the majority of strains were resistant to at least six antibiotics—ampicillin, chloramphenicol, kanamycin, streptomycin, sulphonamides and tetracyclines, and resistance to trimethoprim and gentamicin was also frequently observed. In all of these instances the resistances were plasmid-encoded. It is possible that the enhanced virulence of these strains may also be plasmid-determined. Although this awaits experimental verification, there is no doubt that the dissemination of the resistant strains was facilitated by the use of antibiotics in the countries concerned. As far as is known the food chain was not involved in the spread of these multiresistant strains and the mechanisms of transmission was one of person-to-person spread. Unlike the situation with Salm. typhimurium in Britain, the predisposing selection pressure was due to the use of antibiotics in human medical practice.

An epidemic of multiresistant Shigella dysenteriae 1 occurred in Central America in 1969 and succeeding years. The strain was resistant to chloramphenicol, streptomycin, sulphonamides and tetracyclines and these resistances were plasmid-encoded. There were over 100,000 deaths in this pandemic and there is little doubt that the inappropriate use of antibiotics contributed to the dissemination of this strain. An epidemic of chloramphenicol-resistant Salm. typhi occurred in Kerala, south India in 1972, with associated high mortality (Paniker & Vimala, 1972). The plasmid involved coded for resistance to chloramphenicol, streptomycin, sulphonamides and tetracyclines and was indistinguishable from that in the strain of Salm. typhi which caused over 10,000 deaths in Mexico and surrounding countries in 1972 (Anderson and Smith, 1972). More recently, multiple resistance has been reported in strains of Vibrio cholerae El Tor which have caused epidemics in Tanzania (Mhalu, Mmari & Ijumba, 1979) and Bangladesh (Huq et al., 1980). The Tanzanian strains were resistant to ampicillin, chloramphenicol, kanamycin, streptomycin, sulphonamides and tetracyclines, whereas the strains from Bangladesh were resistant to ampicillin, kanamycin, streptomycin, sulphonamides and trimethoprim. Tetracyclines have been used in the treatment of prophylaxis of cholera in these countries. In these epidemics of Sh. dysenteriae 1, Salm. typhi and V. cholerae, the spread of the strains did not primarily involve either hospitals or the food-chain. In contrast, dissemination in the general community occurred and multiple routes of infection were probably involved.

Although several factors contributed to the establishment and dissemination of the multiresistant strains in all the situations cited here, the underlying factor was the use of antibiotics. If an effective armament of antimicrobial drugs is to be maintained for
clinical purposes, the unnecessary use of antibiotics must be controlled by both the medical practitioner and veterinary surgeon, and by others involved in animal husbandry.

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References


