

EDITORIAL

Les Microbes, auront-ils le dernier mot?

Recent publicity on necrotising fasciitis reminds us that infections remain a serious threat to life and prompts a review of the continuing but changing battle between man and microbe.

The three main factors involved in infection in the individual are host susceptibility, the virulence of the organism and the mechanism of access to the body, but public health measures to reduce the prevalence of the organism and protect communities are as, if not more, important. Until this century infectious diseases were the commonest cause of morbidity and mortality worldwide. This still holds true for most of the world. The advances made in developed countries were initially and predominantly due to economic and public health factors and the further slight reductions in the impact of infection since then due to such innovations as the development of antibiotics may prove difficult to sustain.

Immunisation has played an enormous part in the control of infection. Childhood vaccinations have led to dramatic falls in the incidence of diseases such as polio, whooping cough and latterly *Haemophilus influenzae* type b infections in the West. Measles, a life-threatening scourge of young children in developing countries, is proving preventable and candidate malaria vaccines such as SPf66 are undergoing field trials. The lead-time for new vaccines is, however, long because of the need to weigh the benefits to society against the risks to individuals of side-effects, and the long-term effectiveness of some vaccines is less than optimal, leading, for example, to the current consideration of re-immunisation against diphtheria in the light of the re-emergence of the disease in Eastern Europe.

There have been other successes in the fight against infection. The largesse of the natural world is demonstrated once again by the development of artemisinin antimalarials. Other advances include the adoption of the veterinary drug ivermectin as a highly effective microfilaricide in onchocerciasis, the discovery that liposomal amphotericin B is effective in visceral leishmaniasis and confirmation that BCG gives substantial protection against leprosy. The interferons are proving valuable in patients with hepatitis.

Antibiotic development continues, with some success in improving safety profiles, administration regimes and spectrum of activity. There is, however, little that is truly innovative in this field. As is shown by the emergence of multiply-resistant strains of common organisms such as *Staphylococcus aureus*, *Enterococcus* and *Pseu-domonas*, prevention may well continue to prove more effective, cheaper and achievable than cure. Cryptosporidiosis

typifies a group of microbial diseases for which no effective treatment is currently available.

The study of molecular biology and our increased understanding of the immune response are opening promising avenues in the fight against infection and the damage caused by the body's fight against it. Immunomodulation and the development of inhibitors of the mediators of sepsis will help infected individuals, but those individuals are, realistically, likely to be those in a position to benefit from the high-cost health-care systems of the developed world. It is difficult to see them having much impact on the sum of human suffering due to infection, at least for the foreseeable future.

Historically, *Streptococcus pyogenes* has been a common cause of infection in man, the introduction of antibiotics leading to dramatic reduction in the incidence of pyogenic infections and sequelae such as scarlet and rheumatic fevers. The organism has been relegated to being a cause of cellulitis and pharyngitis.

The debate was whether its reduced pathogenicity was due to therapy or to a change in its virulence to man. Epidemiological monitoring suggests that the latter is the case. It may be true that strains with increased virulence are slowly reappearing.

The occurrence of necrotising fasciitis is rare but its relentless progression despite seemingly effective antibiotics should remind us that our knowledge of the interaction between micro-organisms and man is far from complete. For individual clinicians faced with patients with disease due to infection an understanding of the natural history of infectious diseases is essential.

Organisms newer to medical science such as the AIDS virus and *Legionella* re-emphasize the priorities of surveillance, prevention of spread and appropriate antibiotic prescribing which not only takes into account the individual patient but considers the safety of the community at large. Recent innovations in the NHS and the Services Medical Services such as the introduction of consultants in communicable disease control to complement the public and environmental health services in the community and the continued development of strategies to combat hospital infection are encouraging. In the commercially competitive brave new world of medicine, however, there must be questions as to whether the short-term costs of such preventive measures will be perceived to be justified by the longer-term gains.

Ensuring that man and not microbes have the last word will continue to prove a challenge.

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