Gas Gangrene and Hyperbaric Oxygen

The early report on the value of hyperbaric oxygen in the treatment of gas gangrene by I. Boerema and W. H. Brummelkamp from Amsterdam was promising. It has now been confirmed by B. Roding and colleagues, who describe their experiences over the last twelve years of treating 130 patients with clostridial gas-producing infections. Twenty-nine patients (22%) died, 15 from causes other than gas gangrene. Of the 14 deaths (11%) due to gas gangrene, none occurred after five treatments of 2 hours with oxygen at 3 times atmospheric pressure given in the first 48 hours. As well as reducing the mortality from gas gangrene, hyperbaric oxygen lessens the incidence and extent of the amputations which are required. These authors have discontinued the use of antitoxin since 1964, and out of the 130 patients 29 were not given any antibiotics at all, yet they all survived.

The rationale for this treatment rests on sound experimental evidence. A. J. M. van Unnik and E. H. Lanphier and I. W. Brown showed that hyperbaric oxygen prevents the production of the alpha toxin. W. I. Hopkins and A. G. Towers showed that it inhibits the growth of clostridia in surface culture. And P. F. Nora and colleagues have shown that it almost entirely opposite the effect of a median LD₅₀ of live clostridia injected into animals intramuscularly. T. T. Irvin and colleagues could not duplicate in animal experiments the results obtained by clinicians, but since the disease in man is not identical to that in animals the results of treatment could well be different. Roding and colleagues stress the importance of using 3 atmospheric pressures to attain adequate levels of oxygen in tissues with a poor blood supply. G. Smith and colleagues described a case treated with oxygen at twice atmospheric pressure which did not improve until after amputation was performed, whereas Roding and colleagues amputate only when the line of demarcation has become clear after treatment with hyperbaric oxygen.

Gas gangrene is a rare condition. Indeed the 130 patients of Roding and colleagues represent nearly the whole incidence of the disease in Holland, with a population of 15 million, over ten to twelve years. They use a large pressure chamber which is filled with compressed air. Only the patient breathes 100% oxygen via a facepiece. The staff in the chamber are therefore exposed to the hazards of working in a hyperbaric environment—aseptic bone necrosis and decompression sickness. The incidence of the former in non-manual workers is not known, and the latter can be avoided by rigid attention to correct decompression schedules. The advantages of the large chamber are that its use allows continuous nursing of the patient during treatment, with easier maintenance of intravenous therapy and above all the ability to deal rapidly with unexpected complications such as clearing the airway after vomiting. The disadvantage is the high capital cost and relatively higher running costs, but it is safer for the patient than the single-person chamber.

The only large chamber attached to a hospital in the British Isles is in Glasgow. There is thus a need for another large hyperbaric facility to be provided. It should be sited centrally so that access is easy either off a motorway or by helicopter.

Unquiet Rest

As man’s numbers have grown, so his peace and quiet have diminished. Though wealthier, he finds he has destroyed wildlife, scenic beauty, and solitude. The jet aircraft brought convenience to a privileged few but many people who have to live near airports prefer the older and quieter turboprops. Heavier lorries and more powerful planes can find support in economic statistics but it is less easy to quantify the damage they do to the quality of life. A recent study, however, has done this for some ill-effects of aircraft noise.