

Endocarditis in Heroin Addicts

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Heroin addicts who inject the drug intravenously rarely take any aseptic precautions (Louria, Hensle, and Rose, 1967; Bewley, Ben-Arie, and James, 1968). Syringes and needles are used and re-used without sterilization; frequently they are shared with other addicts. Skin cleansing is most unusual. The heroin is often adulterated with other powders and the injection prepared with unsterile or contaminated water; occasionally, saliva is used. Not surprisingly, local infection and thrombophlebitis are common, and systemic sepsis and bacterial endocarditis may follow. The actual incidence of endocarditis is uncertain but it does not appear to be high. Hussey and Katz (1950), for example, described 102 admissions to hospital for the complications of narcotic addiction in a 9-year period, of which 8 were for endocarditis. Again, Cherubin (1967), in his survey of 361 deaths occurring in

1964 among the estimated 30,000–60,000 heroin addicts in New York, attributed only 6 to endocarditis. Of course, many other patients must have been treated successfully.

So far, few such patients have been seen in Britain but soon there will be more, judging by the rapid increase in heroin addiction in this country (Fig. 1). The purpose of this paper, therefore, is to report an illustrative case recently seen and, drawing largely on American experience, to review the pattern of endocarditis in addicts, which is atypical in certain respects.

CASE REPORT

A 21-year-old man had been addicted to heroin for a year, injecting the drug intravenously without sterile precautions. In December 1966 he became unwell, with fever, sweating, limb pains, and weight loss. He was admitted to hospital under the care of Dr. Hadley in January 1967. His temperature was 39°C. (102°F.), he

Received February 21, 1969.

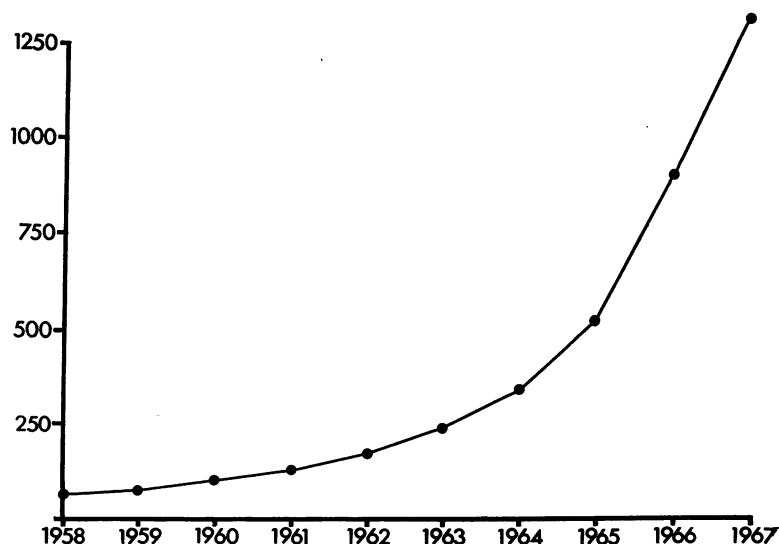


FIG. 1.—The number of heroin addicts in Britain known to the Home Office, 1958–1967.

looked cachectic and anaemic, and the characteristic multiple puncture marks and pigment tattooing of the addict were present along the superficial forearm veins of both arms. There was no clubbing, splenomegaly, or rash. The heart and lungs were normal. He was anaemic (Hb 10.9 g./100 ml.), and there was a polymorphonuclear leucocytosis. Blood cultures grew *Staphylococcus pyogenes* sensitive to all antibiotics. Chest x-ray was normal. Septicaemia was diagnosed and he was treated with ampicillin 2 g. and cloxacillin 2 g. daily in divided dosage intravenously. Heroin was continued. Fever subsided rapidly, and 8 days after admission, when the full results of blood cultures were available, penicillin was substituted for ampicillin and cloxacillin. Immediately fever recurred and the original antibiotic regimen was resumed. At this point a soft pansystolic murmur at the lower left sternal edge was heard for the first time, and tricuspid endocarditis was diagnosed. A week later sudden left-sided pleuritic pain and haemoptysis occurred, and left basal consolidation appeared on the chest x-ray suggesting pulmonary infarction. Next day the consolidation had extended, and a small left pleural effusion had appeared (Fig. 2). Further blood cultures were negative and no pathogens were found in the sputum. Two weeks after this, pleuritic pain recurred on the right side and was accompanied by a pleural rub but no significant x-ray changes appeared. Antibiotics were stopped in the 5th week without incident. The pansystolic murmur persisted and became louder, but the jugular venous pulse did not alter, right ventricular hypertrophy did not develop, and the cardiac size remained normal. Splenomegaly and clubbing did not appear. Heroin was successfully withdrawn during his admission, but at a follow-up visit in July 1967, he had returned to his addiction. The cardiac findings were unchanged.

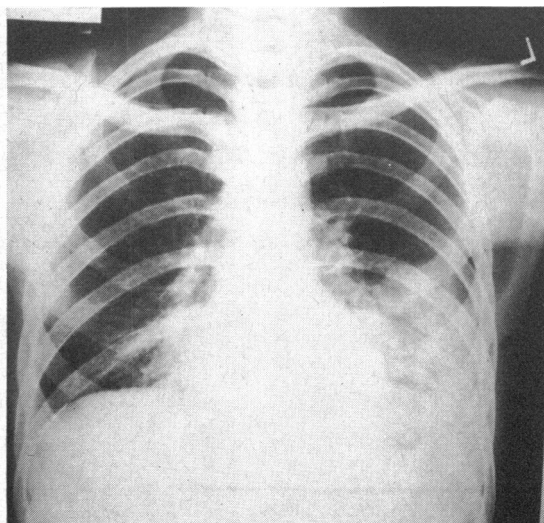


FIG. 2.—Chest x-ray appearances 2 weeks after admission.

DISCUSSION

Endocarditis complicating narcotic addiction differs from that seen in normal clinical practice in several ways. For the purposes of review 60 cases have been collected: the present patient, another patient personally seen, the cases reviewed by Louria *et al.* (1967), and other cases reported by Wilhelm *et al.* (1947), Hussey and Katz (1950), Olsson and Romansky (1962), Carey and Hughes (1967), Cohen and Kaye (1967), and Massumi, Just, and Tawakkol (1967).

Of these 60 patients, 24 (40%) had endocarditis of the tricuspid valve, and 2 more had endocarditis of the pulmonary valve. The rest had infected mitral or aortic valves. This distribution contrasts sharply with the pattern of valve involvement in endocarditis in all other patients, in whom the tricuspid and pulmonary valves are affected in under 5 per cent of cases (Goldburgh, Baer, and Lieber, 1942). The next unusual feature was the low incidence of pre-existing valve disease. This was present in only 16 patients (27%), whereas evidence of an antecedent lesion is normally found in 80 to 90 per cent of patients (Friedberg, Goldman, and Field, 1961; Pankey, 1961). Even more remarkable, only one of the 26 patients with right-sided endocarditis was known to have a previously abnormal valve.

This attack on normal valves, especially on the right side of the heart, is explained partly by the repetitive bacteraemia to which narcotic addicts subject themselves and partly by the nature of the infecting organism, *Staphylococcus pyogenes* being isolated in 23 of the 26 patients with right-sided endocarditis, including the present one. In all, staphylococci were implicated in 31 (52%) of the 60 cases, a strikingly high proportion. Other causative organisms included candida (10 cases) and pseudomonas (4 cases). This unusual collection of primary pathogens reflects the careless, and sometimes bizarre, methods of injection already referred to.

Thus, the characteristic cardiac lesion in narcotic addicts (though not necessarily the commonest) is acute endocarditis of the tricuspid valve, as in the patient described above. In normal practice, this is a rare disease, and its presentation, which is misleading, deserves emphasis. The clinical picture is dominated by repeated episodes of septic pulmonary infarction due to the detachment of infected tricuspid vegetations. Cavitation may occur, particularly in those cases caused by *Staphylococcus pyogenes*, and this organism may be isolated from the sputum. Pulmonary shadowing, pleurisy, or haemoptysis were, in fact, seen in 23 of the 24

patients under review. In contrast, signs of infection of the tricuspid valve itself (principally the murmur of regurgitation) are often inconspicuous, and the present case is, perhaps, unusual in this respect. In 3 of the patients a murmur was only a transient finding, and no murmurs at all were heard in 7 patients who subsequently proved to have tricuspid endocarditis at necropsy. Only 4 of the 24 patients showed any other evidence of tricuspid regurgitation. These features of tricuspid endocarditis are, of course, not peculiar to addicts (Bain *et al.*, 1958).

The diagnosis of tricuspid endocarditis in narcotic addicts, therefore, is suggested by the association of fever, pulmonary infarction, and positive blood cultures. It is true that addicts may develop septic pulmonary infarction following thrombophlebitis of forearm veins without endocarditis (Briggs *et al.*, 1967), but as tricuspid involvement may be silent, it seems wise to treat all such patients as if endocarditis were present.

Because of inadequate case histories it is difficult to be sure of the incidence of other classical signs of bacterial endocarditis in the 24 patients with tricuspid involvement, but splenomegaly was recorded only 4 times and clubbing not at all. Systemic emboli, on the other hand, theoretically should not occur because of the barrier presented by the pulmonary capillary bed, yet they were noted in 13 patients. Probably, the source was secondary phlebitis in the pulmonary veins complicating septic pulmonary infarction; alternatively, occult left-sided endocarditis may have been present.

The treatment of bacterial endocarditis in narcotic addicts is complicated by the difficulty in persuading them to complete full courses of antibiotics. Occasionally, severe valve destruction has occurred and attempts have been made to treat this with prosthetic valve replacement (Carey and Hughes, 1967). Unless the addiction is cured, however, the likelihood of re-infection is high and surgery should be avoided if possible.

SUMMARY

Because of their unclean methods of injection, heroin addicts who inject the drug intravenously are liable to both local and systemic infections. A case of tricuspid endocarditis in a heroin addict is reported. The unusual pattern of endocarditis in

narcotic addicts is reviewed. Normal valves are frequently attacked, particularly the tricuspid. The organisms responsible are unusual. *Staphylococcus pyogenes* is common and other cases have been caused by candida and pseudomonas. Tricuspid endocarditis causes a misleading illness dominated by septic pulmonary infarction with inconspicuous evidence of tricuspid valve infection. These points are briefly discussed.

I am grateful to Dr. G. D. Hadley for permission to publish details of this case which was under his care. I thank Dr. Walter Somerville for his helpful comments and advice.

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