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of the base, and also that there was a dramatic recovery after the drug was withdrawn.

Case 2.—A 24-year-old male Pakistani was seen for amoebic hepatitis and given chloroquine sulphate, 250 mg. q.i.d. He had previously been in excellent mental and physical health. All the liver-function tests were within normal limits. On the sixth day of treatment he was observed to be moody and agitated, and reacted violently to minor emotional experiences. He had complained of severe headache, insomnia, and restlessness since the previous evening. By the following day he had developed frank psychosis. He was confused and disorientated, and had delusions of persecution with an occasional exhibition of aggressive behaviour. The drug was stopped at once and he was treated with chlorpromazine. Within three days his mental status had reverted to normal. After recovery he apologized to persons around him for his behaviour and blamed the drug for whatever had happened.

COMMENT

These two patients developed toxic psychosis during chloroquine therapy and responded dramatically when the drug was withdrawn. The absence of any past history of mental ailment in both patients and also the lack of any clinical features of hepatocellular failure make any other possibility very unlikely. Although textbooks mention slight mental confusion as a rare complication of chloroquine therapy (Dunlop *et al.*, 1961), a frank psychosis has not been described. The doses in our cases were small compared with the much larger doses employed in dermatology and rheumatic disorders. Even Scull (1962) in his recent paper does not mention psychosis as a complication during 24 months' treatment of 160 patients. The only experience is that of J. Schneider (personal communication, 1962), who has written about a patient who developed maniacal symptoms after accidental administration of 6 g. of chloroquine base which cleared up on stopping the drug. This is in agreement with my experience.

The occurrence of toxic psychosis after such small amounts of the drug can perhaps be explained on the basis of an initial sensitization in an indigenous population taking chloroquine from time to time for various ailments.

I have no views on the mechanism of its action on the central nervous system—one can only draw an analogy with mepacrine. The latter is known to have caused psychosis (Dunlop *et al.*, 1961). Chloroquine is an aminoquinoline, while mepacrine is an acridine, but they have a common side-chain. Both are antimalarials and have practically the same therapeutic indications in various parasitic, dermatological, and rheumatic disorders. There the similarity ends, and the mode of action on the brain remains a matter of speculation.

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Medical Memoranda

Two Cases of Chloroquine Psychosis

Chloroquine and allied substances have been used extensively in a variety of diseases on account of their efficacy and their relative freedom from serious side-effects. Glickman *et al.* (1959), in their review of antimalarial agents, stated that chloroquine, hydroxychloroquine, and amodiaquine had about the same toxicity. Except for the occurrence of nausea, vomiting, diarrhoea, anorexia, weakness, and occasional cycloplegia, they noted little else in the way of toxic reactions. Recent publications mention certain dangerous complications of chloroquine, such as corneal opacities and retinopathy (Hobbs *et al.*, 1961; Ormrod, 1962), and fatal pancytopenia (Glick, 1957).

The purpose of this communication is to draw attention to the occurrence of toxic psychosis due to this drug in two patients, a complication not previously encountered.

CASE REPORTS

Case 1.—A Pakistani Muslim aged 34 was seen by his family physician for fever and right hypochondrial pain associated with an enlarged and tender liver. He had no jaundice, and a routine blood count showed a polymorphonuclear leucocytosis. He had suffered on and off from amoebic dysentery, but otherwise had enjoyed excellent mental and physical health. He was diagnosed as suffering from amoebic hepatitis and given chloroquine sulphate, 250 mg. q.i.d., to which he responded, with amelioration of fever and pain. On the sixth day, however, he complained of lightheadedness, and on the seventh day was completely confused and disorientated and suffered from ideas of persecution. When seen by me the same day he was confused, irrational, and agitated, and there were occasional outbursts of violence. His irrational acts included assaulting his wife and father and walking nude in the streets. He subsequently became withdrawn and mentally inaccessible. A diagnosis of toxic psychosis was made and chloroquine was stopped. He was treated with chlorpromazine and intravenous fluids, and within two days he became lucid and rational. It will be observed that this patient developed toxic psychosis after having taken 6 g. of chloroquine sulphate containing 4.8 g.