

## Case Report

# Toxic psychosis due to chloroquine overdose : a case report

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Malaria is an endemic disease in developing countries like India. Peripheral smear examination for malarial parasites, though the gold standard for diagnosis is observer-dependent and may be reported as negative even in strongly-suspected cases. Hence, a large number of patients having fever are empirically treated with antimalarial drugs. Chloroquine and its derivatives have been the drugs of choice in the prophylaxis and treatment of uncomplicated malaria for over many years. Common side-effects of chloroquine are nausea, vomiting and unpleasant taste. Central nervous system adverse events following chloroquine have been described<sup>1–4</sup>. We herein report a child who developed psychosis following chloroquine overdose.

A 7-year-old female child was admitted with complaints of abnormal behaviour in the form of excessive talking and restlessness one day prior to admission. She had a history of high-grade fever with chills, and vomiting five days back. For these complaints the child was taken to a private practitioner who started her on chloroquine and paracetamol. There was no history of convulsion, icterus, loose motions, cough, cold or abdominal pain. There was no history of contact with tuberculosis or head injury. There was no history of similar episodes in past or in other family members. There was no preceding stressful event at home or in school. As per the prescription given by the doctor the dose of tablet chloroquine (base 150 mg) was 10 mg/kg followed by 5 mg/kg at 6, 24 and 48 h. But as the parents didn't

understand the dosing schedule they took four tablets of chloroquine immediately followed by two tablets every two hourly for the next 12 h. Thus, the total dose of chloroquine which the child received was 1.5 g on the first day. The total dose of chloroquine received by the child was approximately 100 mg/kg of base as against the total therapeutic dose of 25 mg/kg of base. Paracetamol was given in the correct dose. The medication was discontinued from the second day as the fever subsided. Developmentally the child was normal and she was studying in 2nd standard and was good in her studies. Birth and family history were insignificant.

On admission the child was afebrile with a heart rate of 100/min and respiratory rate of 24/min. Her blood pressure was 100/70 mm Hg in the right upper arm in the supine position. There was no icterus, pallor or rash on general examination. There were no stigmata of neurocutaneous disorders. Central nervous system examination revealed a restless child with uninhibited behaviour. Her comprehension was normal and she was able to follow instructions. She was well-oriented in time, space and person. The child spoke excessively but speech was not slurred. She had normal cranial nerve examination. Her motor and sensory examination was normal. Deep tendon and superficial reflexes were normally elicited. There were no meningeal or cerebellar signs. No other abnormalities were detected on systemic examination. Her complete blood count, liver function, renal function tests and serum electrolytes were normal.

OptiMal test done for malaria was also negative.

A diagnosis of chloroquine-induced psychosis was made. A psychiatry reference was taken and the child was started on tablet olanzapine 10 mg/day. The child was discharged at request on the 4th hospital day. She has been following up regularly and is normal at last follow-up at six weeks.

Chloroquine is given in an initial dose of 10 mg base/kg/body weight followed by either 5 mg/kg at 6, 24 and 48 h, or more commonly by 10 mg/kg on the second day and 5 mg/kg on the third day<sup>5</sup>. Such a dosing schedule is uncommon in office practice and is difficult to comprehend. Hence, due to a communication gap and the uncommon dosing schedule, patients tend to either take less or more doses of chloroquine. Chloroquine has a low safety margin and is very dangerous in overdose<sup>5</sup>.

Central nervous system toxicity includes convulsions and mental changes. Other uncommon effects are retinopathy, myopathy, reduced hearing, photosensitivity, loss of hair and aplastic anaemia. Acute overdose is extremely dangerous and death can occur within a few hours. The fatal dosage reported in the literature is as little as 1 g of chloroquine phosphate in children and 6 g in adults<sup>1</sup>. The patient may also develop electrolyte disturbances, hypotension and cardiac arrhythmias<sup>5</sup>.

In a patient with malaria, psychosis could be due to the fever itself or the antimalarial drug administered. In our patient, psychosis was probably secondary to chloroquine overdose since it appeared two days after the fever had subsided and three days after an intake of 1.5 g of chloroquine. Psychosis due to chloroquine has been reported to appear with an in-

take of 1–6 g of chloroquine and occurs between two and 40 days after the intake<sup>1</sup>. The exact mechanism of chloroquine-induced psychosis is not known but the role of different neurotransmitter systems—polyamines (especially spermidine) excess, dopamine excess, acetylcholine imbalance and prostaglandin-E antagonism have been postulated. The duration of behavioural changes ranges from two days to eight weeks<sup>1</sup>. The treatment of mania due to chloroquine overdose is supportive and includes antipsychotic medications like olanzapine as long as the patient is symptomatic<sup>6</sup>.

We conclude that chloroquine overdose can cause psychosis and should be used cautiously in the treatment of malaria. The adverse effects due to overdose can persist for several weeks. We highlight the need for proper instruction by doctors when prescribing chloroquine for malaria and the need to check that the parents have understood the dosing schedule.

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