

QUININE

Use

Quinine remains the best studied drug for treating severe malaria in the very young child but the bitter taste means that, for uncomplicated infection in a child well enough to take oral medication, treatment with an artemisinin for 3 days (see the monograph on artemether with lumefantrine) is the more reliable strategy.

Pharmacology

An extract from the bark of the cinchona tree has long been valued as a specific cure for marsh or 'four day' (quaternary) fever. Jesuit priests brought such knowledge back from Peru four centuries ago, and we now know that the active ingredient, the alkaloid quinine, kills malarial schizonts when they transiently enter the blood stream. Known G6PD deficiency is not a contraindication to acute use. Although high dose quinine is a recognised abortifacient, use to treat maternal malaria during pregnancy does not seem hazardous, and use during lactation would only expose the baby to about 5% of the weight-adjusted maternal dose.

Managing severe malaria

Malaria can be rapidly fatal, especially in children less than a year old, and symptoms may be nonspecific. There may be vomiting, diarrhoea and weakness or drowsiness as well as fever, and speedy intervention can make the difference between life and death. Many severely ill children are hypovolaemic and benefit from an immediate transfusion of 20 ml/kg of albumin (q.v.) or, if this is not available, 0.9% sodium chloride. Then correct severe anaemia (haematocrit <15%) with blood (q.v.) or, if the anaemia is gross, or more than 10% of the red cells are parasitized, by exchange transfusion. Monitor, prevent and treat hypoglycaemia with sub-lingual or, if necessary, IV glucose (q.v.). Give lorazepam (q.v.) for seizures and, if this fails, paraldehyde (q.v.). IV mannitol is not helpful, but shock may suggest there is both malaria and septicaemia (with or without meningitis) – start treatment for both if the situation is unclear and review later. Transplacentally acquired infection may only manifest itself 2–8 weeks later with fever, jaundice, anaemia, respiratory symptoms and a large spleen.

Initial treatment

By mouth: See that those well enough to take quinine sulphate (or dihydrochloride) by mouth take 10 mg/kg once every 8 hours for a full 7 days (repeating the dose if vomiting occurs within an hour).

As an IV infusion: Give a loading dose of 20 mg/kg of quinine dihydrochloride (2 ml/kg of a solution made up as specified below) over 4 hours. Then give a continuing infusion of 1 mg/kg per hour (0.1 ml/kg per hour of the same solution). Always use a pump or in-line infusion chamber to avoid cardiotoxicity from rapid administration.

IM administration: 12 mg/kg once every 12 hours for 3 days (or until oral treatment is possible).

Rectal administration: Give 20 mg/kg of quinine, as outlined below, once every 12 hours for 3 days (or until the 7 day course can be completed by mouth). Although IV artesunate is now becoming the treatment of choice a first early rectal dose of quinine or artemether (q.v.) can be lifesaving when skilled care is hours away.

Secondary treatment

Complete treatment as soon as oral medication is possible by giving doxycycline or clindamycin or, alternatively, in those areas where the parasites are still sensitive, pyrimethamine and sulfadoxine:

Doxycycline: Give 2.5 mg/kg of this tetracycline by mouth once every 12 hours for 7 days.

Clindamycin: A 10 mg/kg dose of clindamycin (q.v.) given by mouth once every 8 hours for 7 days is an alternative that avoids the risk of dental staining caused by tetracycline use.

Pyrimethamine and sulfadoxine: Give a quarter tablet of Fansidar[®] on the last day of treatment. Babies 3 or more months old can have half a tablet. For more information see the monograph on pyrimethamine.

Supply and administration

Quinine: Quinine sulphate is available as dividable 200 mg (7p) tablets, and as an IV product (quinine dihydrochloride) from Martindale Pharmaceuticals, Romford, UK in 1 ml and 2 ml ampoules containing 300 mg/ml that cost £2.60 and £3.50 respectively. Take 1 ml of this preparation, and dilute it to 30 ml with 5% or 10% glucose saline to get an IV solution containing 10 mg/ml. IM injection is painful, but quinine can also be given into the rectum – just draw up the dose required, dilute to 4ml with water, and give using a syringe. A less painful buffered product containing four cinchona alkaloids (Quinimax[®]) is widely used in Africa.

Doxycycline: 50 mg capsules cost 6p each. Scored 100 mg dispersible tablets cost 60p. A 5 mg/ml suspension and a 10 mg/ml syrup (Vibramycin[®]) are available in America.

References

See also the relevant Cochrane reviews ©

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