Summary of Product Characteristics
AVQUIN 300
(Quinine Sulphate Tablets BP 300 mg)

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1. Name of the medicinal product

AVQUIN 300

Quinine Sulphate Tablets BP 300 mg

2. Qualitative and quantitative composition

Each film-coated tablet contains quinine sulphate BP 300 mg.

Excipient with known effect
Each film-coated tablet contains 32.00 mg of lactose monohydrate.

For the full list of excipients, see section 6.1.

3. Pharmaceutical form

Film-coated tablet.

White, circular, biconvex, film-coated tablets, plain on both sides.

4. Clinical particulars

4.1 Therapeutic indications

- Treatment of falciparum malaria, including chloroquine-resistant Plasmodium falciparum infection, in adults and in children aged 5 years or older (and weighing 20 kg or more).
- Treatment and prevention of nocturnal leg cramps in adults and the elderly, when the cramps cause regular disruption of sleep (see sections 4.2 and 4.4).

4.2 Posology and method of administration

Treatment of falciparum malaria

Adults (including the elderly) and children aged 12 years and over
600 mg of quinine sulphate every 8 hours for 7 days. The dose and interval may be adjusted according to the size of the patient, the severity of infection, and the presence of renal or hepatic disease (in which case the dosing interval should be increased owing to the prolonged half-life of the drug).

Children aged 5 to 11 years (weighing 20 kg or more)
10 mg of quinine sulphate per kg body weight every 8 hours for 7 days. AVQUIN 300 is not suitable for children weighing less than 20 kg or aged less than 5 years.

If quinine resistance is known or suspected on completion of the course, additional treatment may be given, either doxycycline 200 mg daily (as a single dose or in two divided doses) for at least 7 days, or clindamycin 300 mg four

times daily for 5 days. If part or all of a dose is vomited within 1 hour of administration, the same dose should be administered again immediately.

Treatment and prevention of nocturnal leg cramps

Adults (including the elderly)

The recommended dose is 200 mg at bedtime; the maximum dose is 300 mg at bedtime. A reduction in the frequency of leg cramps may take up to 4 weeks to become apparent, and patients should be monitored closely for adverse effects during the early stages of treatment. Treatment should be stopped after an initial trial of 4 weeks if there is no benefit, and should be interrupted at approximately three-monthly intervals to reassess the need for continued treatment.

Method of administration

For oral use.

4.3 Contraindications

- Hypersensitivity to quinine, quinidine, mefloquine or the cinchona alkaloids, or to any of the excipients listed in section 6.1.
- Optic neuritis.
- Tinnitus.
- Haemolysis or haemoglobinuria.
- Myasthenia gravis (quinine may cause severe respiratory distress and dysphagia in these patients).
- History of blackwater fever, which quinine may precipitate.
- Previous thrombocytopenia, thrombotic thrombocytopenic purpura or haemolytic-uraemic syndrome associated with quinine, or any previous adverse reaction to quinine (including that occurring after tonic water or other quinine-containing beverages).

4.4 Special warnings and precautions for use

Cinchonism

Quinine may give rise to cinchonism, which is generally more severe in overdose but may also occur at normal therapeutic doses. Patients should be warned not to exceed the prescribed dose because of the risk of serious, irreversible effects in overdose. Treatment for nocturnal leg cramps should be stopped if symptoms of cinchonism (tinnitus, impaired hearing, headache, nausea and disturbed vision) emerge (see sections 4.8 and 4.9).

Hypersensitivity

Hypersensitivity to quinine may occur with symptoms of cinchonism together with urticaria, flushing, pruritus, rash, fever, angioedema, dyspnoea and asthma. Serious hypersensitivity reactions, including Stevens-Johnson syndrome, have been reported.

Cardiac disorders and QT prolongation

Quinine should be used with caution in patients with atrial fibrillation, conduction defects, heart block or other serious heart disease, and may cause hypoprothrombinaemia and enhance the effects of anticoagulants. Quinine has dose-dependent QT-prolonging effects; caution is required in patients with conditions predisposing to QT prolongation and in patients with atrioventricular block.

Glucose-6-phosphate dehydrogenase (G6PD) deficiency and blackwater fever

Quinine has been implicated in precipitating blackwater fever when given for prolonged periods, in some cases associated with G6PD deficiency. Patients with G6PD deficiency may be at increased risk of haemolysis and may develop acute haemolytic anaemia during quinine therapy. Quinine should not, however, be withheld from pregnant women with life-threatening malaria (see section 4.6). Treatment should be monitored in all patients in case signs of resistance develop.

Thrombocytopenia

Quinine may cause unpredictable, serious and life-threatening thrombocytopenia, thought to be an idiosyncratic hypersensitivity reaction. It must not be given to patients who have previously experienced any adverse reaction to quinine, including from tonic water or other beverages. Patients should be instructed to stop treatment and consult a physician if signs of thrombocytopenia, such as unexplained bruising or bleeding, occur.

Use for nocturnal leg cramps

Before use for nocturnal leg cramps, the risks (including significant adverse effects and interactions) should be weighed carefully against the potential benefit; these risks are of particular concern in the elderly. Quinine should be considered only when cramps are very painful or frequent, when other treatable causes have been excluded, and when non-pharmacological measures have failed. It must not be used for this indication during pregnancy (see section 4.6).

Renal or hepatic impairment

The dose should be reduced, or the interval between doses increased, in patients with renal or hepatic disease.

Excipients

This medicinal product contains lactose. Patients with rare hereditary problems of galactose intolerance, total lactase deficiency or glucose-galactose malabsorption should not take this medicinal product. It also contains less than 1 mmol sodium (23 mg) per tablet, that is to say essentially 'sodium-free'.

4.5 Interaction with other medicinal products and other forms of interaction

Effect of other medicinal products on quinine

Quinine is metabolised via hepatic cytochrome P450, predominantly CYP3A4. Potent CYP3A4 inhibitors (e.g. azole antifungals and HIV protease inhibitors) and cimetidine may increase quinine plasma concentrations and toxicity, whereas

CYP3A4 inducers (rifampicin, barbiturates, carbamazepine and phenytoin) may reduce quinine concentrations and therapeutic effect.

Effect of quinine on other medicinal products

- Cardiac glycosides: quinine increases plasma digoxin concentrations; the maintenance dose of digoxin should be halved.
- Flecainide and mefloquine: plasma concentrations may be increased; there is an increased risk of convulsions with mefloquine.
- Amantadine: renal clearance may be reduced, with a risk of amantadine toxicity.
- Ciclosporin: quinine may decrease ciclosporin plasma concentrations.
- Anti-epileptics: quinine may increase phenobarbital and carbamazepine levels; monitor closely.
- Suxamethonium: quinine enhances its neuromuscular blocking effect.
- Oral hypoglycaemics: concurrent use may increase the risk of hypoglycaemia.
- Anticoagulants: quinine may cause hypoprothrombinaemia and enhance anticoagulant effect; dose reduction may be required.

QT prolongation and antimalarials

- Concomitant use with other medicinal products that prolong the QT interval (e.g. amiodarone, moxifloxacin, pimozide, thioridazine, terfenadine, astemizole and halofantrine) should be avoided owing to the increased risk of ventricular arrhythmias. Quinidine may increase the likelihood of cinchonism.
- Chloroquine and quinine are antagonistic when given together for P. falciparum malaria; concomitant artemether/lumefantrine should be avoided; plasma concentrations of primaquine may be decreased.

4.6 Fertility, pregnancy and lactation

Pregnancy

Large doses of quinine can induce abortion, and quinine may cause congenital abnormalities of the central nervous system and extremities; phototoxicity and deafness have been reported in neonates after large doses during pregnancy. Quinine sulphate should not be used during pregnancy unless the benefit outweighs the risk. However, malaria is potentially serious in pregnancy and poses a threat to mother and foetus; pregnancy is not generally regarded as a contraindication to quinine in falciparum malaria, and there is little justification for withholding treatment where no suitable alternative exists. Quinine sulphate must not be used to treat nocturnal leg cramps during pregnancy.

Breast-feeding

Quinine sulphate is excreted in breast milk, although no problems in humans have been reported. It should not be given to nursing mothers unless the benefit

outweighs the risk. Infants at risk of G6PD deficiency should not be breast-fed until the condition has been excluded.

Fertility

The effects of quinine on human fertility are unknown.

4.7 Effects on ability to drive and use machines

Quinine may cause visual disturbances and vertigo; patients who are affected should be advised not to drive or operate machinery.

4.8 Undesirable effects

Summary of the safety profile

Cinchonism is more common in overdose but may occur even after normal doses; in its mild form it presents with tinnitus, impaired hearing, headache, nausea, rashes and disturbed vision, while severe manifestations may include gastrointestinal effects, oculotoxicity, central nervous system disturbances, cardiotoxicity and death. The most serious reactions are idiosyncratic haematological effects (including life-threatening thrombocytopenia), hypersensitivity reactions and cardiac conduction disturbances.

Tabulated list of adverse reactions

The adverse reactions reported with quinine are derived largely from spontaneous reporting and their frequency cannot be estimated from the available data; all are therefore classified as 'not known'. Frequency categories are defined as: very common (≥ 1/10); common (≥ 1/100 to < 1/10); uncommon (≥ 1/1,000 to < 1/100); rare (≥ 1/10,000 to < 1/1,000); very rare (< 1/10,000); and not known (cannot be estimated from the available data).

System Organ Class	Adverse reaction	Frequency
Blood and lymphatic system disorders	Thrombocytopenia, disseminated intravascular coagulation, hypoprothrombinaemia, haemoglobinuria, oliguria, haemolytic uraemic syndrome, pancytopenia, haemolysis, agranulocytosis, thrombocytopenic purpura	Not known
Immune system disorders	Hypersensitivity reactions, including angioneurotic oedema, asthma, photosensitivity, urticaria, pruritus, flushing and fever; eczematous dermatitis, oedema, erythema and lichen planus	Not known
Metabolism and nutrition disorders	Hypoglycaemia	Not known
Psychiatric disorders	Agitation, confusion	Not known
Nervous system disorders	Headache, vertigo, excitement, loss of consciousness, coma	Not known
Eye disorders	Blurred vision, defective colour perception, visual field constriction	Not known
Ear and labyrinth disorders	Tinnitus, impaired hearing	Not known

System Organ Class	Adverse reaction	Frequency
Cardiac disorders	Atrioventricular conduction disturbances, hypotension with a feeble pulse, prolongation of the QT interval, widening of the QRS complex, T-wave flattening	Not known
Respiratory, thoracic and mediastinal disorders	Bronchospasm, dyspnoea	Not known
Gastrointestinal disorders	Nausea, vomiting, diarrhoea, abdominal pain	Not known
Skin and subcutaneous tissue disorders	Flushing, rash, urticaria, eczematous dermatitis, oedema, erythema, lichen planus, pruritus, photosensitivity, Stevens-Johnson syndrome	Not known
Musculoskeletal and connective tissue disorders	Muscle weakness, aggravation of myasthenia gravis	Not known
Renal and urinary disorders	Renal insufficiency, acute renal failure, oliguria	Not known
Reproductive system and breast disorders	Abortion (with toxic doses)	Not known
General disorders and administration site conditions	Cinchonism, fever	Not known

Cinchonism is more common in overdose but may occur even after normal doses of quinine (see section 4.9). Visual disorders may include blurred vision, defective colour perception, visual field constriction and, rarely, total blindness. Abdominal symptoms may occur after long-term administration.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions to the National Regulatory Authority.

4.9 Overdose

Symptoms

Acute intoxication may follow ingestion of 4 to 12 g; the average fatal dose in an adult is about 8 g, although deaths have been reported after as little as 1.5 g in an adult and 900 mg in a child. Overdosage may cause serious effects including irreversible visual loss and can be fatal. Symptoms include vomiting, tinnitus, deafness, headache, vasodilation and disturbed vision. Features of significant overdose include convulsions, impaired consciousness, coma, respiratory depression, QT prolongation, ventricular arrhythmia, cardiogenic shock and renal failure. Hypokalaemia and hypoglycaemia may occur, and high doses are teratogenic and may cause miscarriage.

Management

Each 300 mg quinine sulphate tablet is equivalent to approximately 248 mg of quinine base. Children under 5 years who have ingested any amount, and older children and adults who have taken more than 30 mg/kg of quinine base, should be referred to hospital. Activated charcoal (50 g for adults; 1 g/kg for children) should be considered if the patient presents within 1 hour of ingestion; multiple-dose activated charcoal enhances quinine elimination. Patients should be observed for at least 12 hours, with monitoring of cardiac conduction and rhythm, serum electrolytes, blood glucose and visual acuity. Further treatment is symptomatic and supportive, directed at maintaining blood pressure, respiration and renal function and at controlling arrhythmias, convulsions, hypoglycaemia and acidosis. There is no specific antidote, and measures to accelerate elimination such as dialysis are of limited value.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: antimalarials, methanolquinolines (cinchona alkaloids). ATC code: P01BC01.

Mechanism of action

Quinine is a cinchona alkaloid and 4-methanolquinoline antimalarial that acts as a rapidly acting blood schizontocide against Plasmodium falciparum, P. vivax, P. ovale and P. malariae. It is active against the gametocytes of P. malariae and P. vivax but not against the mature gametocytes of P. falciparum, and it has no activity against exo-erythrocytic forms, so it does not produce a radical cure in vivax or ovale malaria. The precise antimalarial mechanism is not fully established but may involve interference with parasite lysosome function or nucleic acid synthesis.

Pharmacodynamic effects

Quinine acts on the motor end-plate of skeletal muscle and prolongs the muscle refractory period, reducing the response to tetanic stimulation, which underlies its use in nocturnal leg cramps. Like quinidine, it is a sodium-channel blocker with local anaesthetic and both anti-arrhythmic and pro-arrhythmic properties, and it affects the central nervous, cardiovascular, gastrointestinal and pancreatic systems. As an antimalarial it is more toxic and less effective than chloroquine but is especially useful against chloroquine-resistant strains.

5.2 Pharmacokinetic properties

The pharmacokinetics of quinine are significantly altered by malaria infection, with reductions in both the apparent volume of distribution and clearance.

Absorption

Quinine is rapidly and almost completely absorbed from the gastrointestinal tract, with peak plasma concentrations attained about 1 to 3 hours after oral administration of the sulphate.

Distribution

Plasma protein binding is about 70% in healthy subjects, rising to 90% or more in patients with malaria. Quinine is widely distributed; concentrations in the cerebrospinal fluid of patients with cerebral malaria are about 2 to 7% of plasma concentrations. It crosses the placenta and is excreted in breast milk.

Biotransformation

Quinine is extensively metabolised in the liver, predominantly by CYP3A4.

Elimination

Quinine is rapidly excreted, mainly in the urine; the proportion excreted unchanged varies from less than 5% to about 20%, and excretion is increased in acidic urine. Small amounts appear in bile and saliva. The elimination half-life is about 11 hours in healthy subjects but may be prolonged in patients with malaria.

5.3 Preclinical safety data

The safety profile of quinine sulphate is well characterised from many years of clinical use, and this human experience is the principal basis for the safety information in section 4. In animal studies, high doses of quinine have been associated with reproductive and developmental toxicity, including teratogenic and ototoxic effects, which are consistent with the warnings in sections 4.4 and 4.6.

6. Pharmaceutical particulars

6.1 List of excipients

- Maize Starch BP
- Lactose monohydrate BP
- Microcrystalline Cellulose BP
- Sodium Starch Glycolate BP
- Isopropyl Alcohol BP
- Povidone (PVP K30) USP
- Purified Talc BP
- Magnesium Stearate BP
- Colloidal Silicon Dioxide BP
- White film coating (HPMC-based, FC4W-U4 white) IHS

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

36 months.

6.4 Special precautions for storage

Store at a temperature not exceeding 30°C. Protect from light and moisture. Keep out of the reach of children.

6.5 Nature and contents of container

10 × 10 tablets (100 tablets) packed in a printed carton together with a package insert.

6.6 Special precautions for disposal and other handling

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

7. Marketing Authorisation Holder

AVEO PHARMACEUTICALS PVT LTD

Plot No. C/13, Tarapur Industrial Area MIDC, Boisar, Palghar-401 506, Maharashtra, India.

Manufacturer
ZAIN PHARMA LTD

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8. Marketing Authorisation Number

CTD12762

9. Date of first authorisation / renewal of the authorisation

03.07.2026

10. Date of revision of the text

02.07.2026