1.3 Product Information

1.3.1 Summary of product characteristics (SmPC)

1. Name of the medicinal product

Artesunate For Injection 60 mg/Vial

2. Qualitative and Quantitative composition:

Each vial contains:
Artesunate (As Sterile Lyophilized powder) (In House) (60 mg)

Qualitative and Quantitative formula:

Standard batch size: 5.750 KG / 93,042 Vials						
Sr. No.	**Ingredient**	**Reference**	**Quantity/ Vial**	**Overages %**	**Quantity/ Batch**	**Function**
1.	ARTESUNATE (STERILE)	IH	60.0 mg	3.0%	5.750* Kg	Active Ingredient

Note:*Considering 100% assay.

3. Pharmaceutical form

Dry Powder Injection

4. Clinical particulars

4.1 Therapeutic indication

It is indicated for the treatment of severe malaria caused by Plasmodium falciparum, in adults and children.

4.2 Posology and method of administration

Adults and children: Artesunate injection is administered at a dose of 2.4 mg of artesunate/kg body weight, by intravenous (I.V.) or intramuscular (l.M.) injection, at 0, 12 and 24 hours, then once daily until oral treatment can be substituted.
Administration: The powder for injection is difficult to dissolve and care should be taken to ensure that it is completely dissolved before parenteral administration The formulation should be used immediately after reconstitution. If the solution is cloudy or precipitate is present, the

parenteral solution should be discarded. Do not use water for injection for reconstitution of the artesunate powder or for dilution of the resulting solution prior to injection.
The powder for injection should be reconstituted with 1 ml of sodium bicarbonate 5% w/v, shake vigorously till the solution become clear.
For I.V. Use: Add 5 ml of sodium chloride 0.9% w/v and mix again to prepare final concentration of 10 mg/ml for I. V. use. The required amount of drug for I. V. use should be administered slowly over a period of 2-3 minutes. For I.M. Use: Add 2 ml of sodium chloride 0.9% w/v and mix again to prepare final concentration of 20 mg/ml for I.M. use.

Method of administration: Intravenous or Intramuscular.

4.3 Contraindication
It is contraindicated in patients with hypersensitivity to artesunate or other artemisinin derivatives.

4.4 Special warning and precautions for use

Non-falciparum malaria: Artesunate has not been evaluated in the treatment of severe malaria due to Plasmodium vivax, Plasmodium malariae or Plasmodium ovale. In cerebral malaria and complicated malaria, general supporting therapy is usually required.
Renal/hepatic impairment: Dose adjustment is not necessary in patients with hepatic or renal impairment.

Pregnancy: There has been limited clinical experience with the use of artesunate in pregnancy. In animal studies, artesunate has been associated with foetal toxicity during the first trimester of pregnancy. To date, clinical data regarding safety in the first trimester have not indicated an increased risk of foetal harm. Treatment with artesunate should not be withheld during the first trimester if it is potentially life-saving for the mother.

Lactation: The active metabolite of artesunate is excreted at low levels in breast milk. The drug levels are not expected to cause any adverse effects in breast fed infants. The amount of drug present in breast milk does not protect the infant from malaria.

4.5 Interaction with other medicinal products and other forms of interaction

Few clinical drug-drug interaction studies have been performed; however no clinically significant interactions have been identified**.**

4.6 Pregnancy and lactation

Pregnancy: There has been limited clinical experience with the use of artesunate in pregnancy. In animal studies, artesunate has been associated with foetal toxicity during the first trimester of pregnancy. To date, clinical data regarding safety in the first trimester have not indicated an increased risk of foetal harm. Treatment with artesunate should not be withheld during the first trimester if it is potentially life-saving for the mother.

Lactation: The active metabolite of artesunate is excreted at low levels in breast milk. The drug levels are not expected to cause any adverse effects in breast fed infants. The amount of drug present in breast milk does not protect the infant from malaria

4.7 Effect on ability to drive and use machines

Patients receiving Artesunate for injection should be warned that dizziness may occur, in which case they should not drive or use machines.

4.8 Undesirable effects

Blood and lymphatic systems disorders: Neutropenia and anaemia (both occasionally severe), thrombocytopenia, pure red cell aplasia, post-treatment anaemia, mild and transient decrease in reticulocyte count.

Nervous system disorders·: Dizziness, light-headaches, headache, insomnia, tinnitus, peripheral neuropathy.

Respiratory disorders: Cough, nasal symptoms

Gastrointestinal disorders: Altered taste, nausea, vomiting, abdominal pain or cramps, diarrhoea, raised serum amylase, pancreatitis.

Hepatobiliary disorders: Transient rises in liver transaminases (AST, ALT), hepatitis.

Skin and subcutaneous tissue disorders: Rash, alopecia.

Musculoskeletal and connective tissue disorders: Arthralgia, muscle disorders

General disorders and administration site conditions: Fatigue, malaise, fever, pain at injection site.

Immune system disorders: Hypersensitivity

4.9 Overdose

Experience of acute overdose with artesunate is limited. The overdose of artesunate is associated with pancytopenia, melena, seizures, multi organ failure and death. Treatment of overdose should consist of general supportive measures.

5 Pharmacological properties

5.1 Pharmacodynamic properties

Artesunate is a hemisuccinate derivative of dihydro-artemisinin, which is itself formed by the reduction of artemisinin. The mechanism of action of the artemisinins likely involves cleavage of the internal endoperoxidc bridge through reaction with haeme within the infected erythrocyte, thereby generating free radicals which alkylate vital parasite proteins. However, artemisinins have also been reported to inhibit an essential parasite calcium adenosine triphosphatase. The artemisinins are distinguished from other antimalarials by their ability to kill all erythrocytic stages of the malaria parasite, including the relatively inactive ring stage and late schizonts, as well as the gametocytes responsible for malaria transmission. Artesunate and the artemisinins are the most rapid acting of the antimalarials, and they have also been shown to enhance splenic clearance of infected erythrocytes by reducing cytoadherence.

5.2 Pharmacokinetic properties

Absorption: After intravenous injection artesunate is very rapidly biotransformed to its active metabolite, dihydroartemisinin (DHA). Consequently, artesunate half-life (t1/2) is estimated to be less than 5 minutes. Artesunate is rapidly absorbed following intramuscular injection, and peak plasma levels are generally achieved within 30 minutes of administration.

Distribution: Dihydroartemisinin (DHA) has been shown to substantially accumulate in P. falciparum infected erythrocytes. Plasma protein binding of dihydroartemisinin is determined to be 93% in patients and 88% in healthy volunteers.

Metabolism Elimination: Artesunate is extensively and rapidly hydrolysed by plasma esterases, with possible minimal contribution by CYP2A6. The main metabolite, dihydroartemisinin, accounts for most of the in vivo antimalarial activity of IV administration. DHA is further metabolized in the liver via glucuronidation and is excreted in the urine;

adihydroartemisinin-P-glucuronide has been identified as the major urinary product in patients with falciparum malaria.

5.3 Preclinical safety data

Not applicable

6 Pharmaceutical particulars

6.1 List of excipients

Not Applicable as it is a Dry Powder Injection.

6.2 Incompatibilities:

Not applicable.

6.3 Shelf life

36 months

6.4 Special precautions for storage

Store below 30°C. Protect from light and moisture.

6.5 Nature and contents of container

A white Crystalline powder is filled in 7.5 ml Moulded Clear Vial USP Type III with Grey Bromo Butyl Rubber Stopper & 20 mm flip off Aluminium Seals. Such one vial is packed in a transparent tray pack with 1 ml Sodium bicarbonate Injection BP (5.0% w/v) & 5 ml Sodium Chloride Injection BP (0.9% w/v). Such one Tray is packed in a printed carton with packing insert.

6.6 Special precautions for disposal and other handling:
No special requirements. Any unused medicinal product or waste material should be disposed of in accordance with

7 Marketing authorization holder

M/S. ZMC INTERNATIONAL LIMITED.,
7A NIGER STREET, KANO , KANO STATE , NIGERIA.

Manufacturer
Kamla Lifesciences Ltd.
Plot No., G-84/1, Tarapur M.I.D.C, Boisar, Palghar, Boisar - 401506, Taluka: , District: Palghar, Gujarat, India.

Applicant:

ZMC INT'L LIMITED,
NO 6 DAMATTA WAY AIR-PORT ROAD KANO, KANO

8.Marketing Authorization Number
Not Applicable.

9. Date of First Authorization/Renewal of the Authorization
Not Applicable.

10. Date of Revision of the Text
Not Applicable.