

**1. NAME OF THE MEDICINAL PRODUCT**

IVERMECTIN 3 mg TABLETS, IVERMECTIN 6 mg, TABLETS

**2. QUALITATIVE AND QUANTITATIVE COMPOSITION**

IVERMECTIN 3 TABLETS

Each tablet contains 3mg

IVERMECTIN 6 TABLETS

Each tablet contains 6mg.

**3. PHARMACEUTICAL FORM**

Tablet

**4. Clinical particulars**

**4.1 Therapeutic indications**

Treatment of gastrointestinal strongyloidiasis (anguillulosis).

Treatment of suspected or diagnosed microfilaraemia in patients with lymphatic filariasis due to *Wuchereria bancrofti*.

Treatment of human sarcoptic scabies. Treatment is justified when the diagnosis of scabies has been established clinically and/or by parasitological examination. Without formal diagnosis treatment is not justified in case of pruritus..

**4.2 Posology and method of administration**

Posology

Treatment of gastrointestinal strongyloidiasis

The recommended dosage is one single oral dose of 200 micrograms of ivermectin per kg body weight.

For guidance, the dose, as determined by the patient's weight, is as follows:

Body Weight (kg)	Dose (number of 3mg tablet)	Dose (Nos of 6mg tablet)
15 to 24	1	½
25 to 35	2	1
36 to 50	3	1½
51 to 65	4	2
66 to 79	5	2½
≥ 80	6	3

Treatment of microfilaraemia caused by *Wuchereria bancrofti*

The recommended dosage for mass distribution for the treatment of microfilaraemia caused by *Wuchereria bancrofti* is a single oral dose once every 6 months designed to provide approximately 150 to 200 µg/kg of body weight.

In endemic areas where treatment can only be administered once every 12 months, the recommended dosage is 300 to 400 µg/kg of body weight to maintain adequate suppression of microfilaraemia in treated patients.

For guidance, the dose, as determined by the patient's weight, is as follows:

<b>Body Weight (kg)</b>	<b>Dose when given once every 6 months (number of 3mg tablet)</b>	<b>Dose when given once every 6 months (number of 6mg tablet)</b>	<b>Dose when given once every 12 months (number of 3mg tablet)</b>	<b>Dose when given once every 12 months (number of 6mg tablet)</b>
15 to 25	1	½	2	1
26 to 44	2	1	4	2
45 to 64	3	1½	6	3
65 to 84	4	2	8	4

Alternatively, and if no scales are available, the dose of ivermectin for use in mass chemotherapy campaigns may be determined by the patient's height as follows:

<b>Height (cm)</b>	<b>Dose when given once every 6 months (number of 3mg tablet)</b>	<b>Dose when given once every 6 months (number of 6mg tablet)</b>	<b>Dose when given once every 12 months (number of 3mg tablet)</b>	<b>Dose when given once every 12 months (number of 6mg tablet)</b>
90 to 119	1	½	2	1
120 to 140	2	1	4	2
141 to 158	3	1½	6	3
65 to >158	4	2	8	4

#### Treatment of human sarcoptic scabies

The recommended dosage is a single oral dose to provide ivermectin 200 µg/kg body weight.

Common scabies:

Recovery will be considered as definite only after 4 weeks of the treatment. Persistence of pruritus or scraping lesions does not justify a second treatment before this date.

Administration of a second dose within 2 weeks after the initial dose should only be considered:

- a) when new specific lesions occur,
- b) when the parasitologic examination is positive at this date.

Profuse and crusting scabies:

In these heavily infected forms, a second dose within 8 to 15 days of ivermectin and/or concomitant topical therapy may be necessary to obtain recovery.

#### Note for patients treated for scabies

Contact persons, especially family members and partners, should undergo a medical examination as soon as possible, and if necessary should be given prompt antiscabies treatment.

Hygienic measures to prevent reinfection should be taken into account (i. e. keeping fingernails short and clean) and official recommendations regarding the cleaning of clothing and bedding should be closely followed.

#### *Pediatric population*

For all indications, safety in pediatric patients weighing less than 15 kg of body weight has not been established.

#### *Elderly patients*

Clinical studies with ivermectin did not include enough subjects aged 65 years and over to determine whether they respond differently from younger subjects. Other reported clinical experience has not identified differences in responses between the elderly and younger patients. In general, treatment of an elderly patient should be cautious, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy.

#### Method of administration

Oral route.

In children less than 6 years of age, tablets should be crushed before swallowing. Treatment is one single oral dose taken with water on an empty stomach.

The dose may be taken at any time of the day, but no food should be taken within two hours before or after administration, as the influence of food on absorption is unknown.

### **4.3 Contraindications**

Hypersensitivity to the active substance or to any of the excipients.

### **4.4 Special warnings and precautions for use**

#### Special warnings

Efficacy and dosing regimen of ivermectin in immunocompromised patients being treated for intestinal strongyloidiasis have not been established by adequate clinical studies. There have been reported cases which show the persistence of infestation following a single dose of ivermectin, particularly in this type of patients.

Ivermectin is not a prophylactic therapy of infection with filariae or anguillulosis; there are no data available demonstrating the efficacy of ivermectin, either for killing or preventing the maturation of infective larvae in humans.

Ivermectin has not been shown to have any activity against the adult worm of any species of filariae. Ivermectin has not been shown to have any beneficial effect on tropical pulmonary eosinophilia syndrome, on lymphadenitis or lymphangitis observed in case of infection with filariae.

Following administration of ivermectin, the intensity and severity of adverse experiences are probably related to the pretreatment microfilarial density particularly in the blood. In patients co-infected with *Loa loa*, microfilarial density, particularly in the blood, is most often high which

predisposes the treated patients to an increased risk in the occurrence of serious adverse experiences.

CNS adverse experiences (encephalopathies) have been rarely reported in patients treated with ivermectin and co-infected by a high number of microfilariae of *Loa loa*. Consequently, in *Loa loa* endemic areas, special measures should be taken before any treatment with ivermectin (see section 4.8).

Concomitant treatment with diethylcarbamazine citrate (DEC) and ivermectin in mass chemotherapy campaigns for filariasis caused by *Wuchereria Bancrofti* in Africa is not recommended. Co-infection with other microfilariae, such as *Loa loa* may result in high microfilaraemia in patients infected.

Systemic exposure to DEC in such patients may result in the occurrence of serious side effects related to the rapid and effective microfilaricidal effects of this drug.

Following administration of drugs with a rapid microfilaricidal action such as DEC in patients with onchocerciasis, cutaneous and/or systemic reactions of varying severity (the Mazzotti reaction), and ophthalmological reactions have been reported.

These reactions are probably due to inflammatory responses to degradation products released following the death of microfilariae.

Patients treated with ivermectin for onchocerciasis may also experience these reactions when treated for the first time. After treatment with a microfilaricidal drug, patients with hyperreactive onchodermatitis or "Sowda" (observed particularly in Yemen) may be more likely than others to experience severe cutaneous adverse reactions (oedema and aggravation of onchodermatitis).

#### *Paediatric population*

Safety in paediatric patients weighing less than 15 kg of body weight has not been established.

### **4.5 Interaction with other medicinal products and other forms of interaction**

No interaction studies have been performed.

### **4.6 Pregnancy and Lactation**

#### Pregnancy

During mass treatment of onchocerciasis, data on a limited number (approximately 300) of pregnant women indicated no adverse effects such as congenital anomalies, spontaneous abortions, stillbirths and infant mortality which might be associated with ivermectin treatment during the first trimester of pregnancy. To date, no other epidemiological data are available.

Animal studies have shown reproductive toxicity (see section 5.3); however, the predictive value of these observations has not been established.

Ivermectin should only be used when strictly indicated.

#### Breastfeeding

Less than 2% of the administered dose of ivermectin appears in breast milk.

Safety of use has not been established in newborn infants. Ivermectin may only be given to breastfeeding mothers if the expected benefit outweighs the potential risk to the infant.

#### Fertility

Ivermectin had no adverse effects on the fertility in rats up to 3 times the maximum recommended human dose of 200 µg/kg (on a mg/m<sup>2</sup>/d basis).

#### **4.7 Effects on ability to drive and use machines**

The effect of IVERMECTIN on the ability to drive and use machines has not been studied. The possibility in some patients of side effects such as dizziness, somnolence, vertigo and tremor, which may affect the ability to drive or use machines, cannot be excluded (see section 4.8).

#### **4.8 Undesirable effects**

Transient hypereosinophilia, liver dysfunction including acute hepatitis, increased liver enzymes, hyperbilirubinemia and haematuria have been reported.

Very rarely, toxic epidermal necrolysis and Stevens-Johnson syndrome have also been reported.

Side effects are related to the parasite density and are mild and transient in the majority of cases, but their severity may be increased in patients infected with more than one parasite, particularly in the case of infestation with *Loa loa*.

Rarely, severe and potentially fatal cases of encephalopathy have been described following administration of ivermectin, particularly in patients also heavily infected with *Loa loa*. In these patients, the following adverse reactions have also been reported: back or neck pain, ocular hyperaemia, subconjunctival haemorrhage, dyspnoea, urinary and/or faecal incontinence, difficulty in standing/walking, mental status changes, confusion, lethargy, stupor or coma (see section 4.4).

In patients receiving ivermectin for the treatment of strongyloidiasis, the following adverse reactions have been reported: asthenia, abdominal pain, anorexia, constipation, diarrhoea, nausea, vomiting, dizziness, somnolence, vertigo, tremor, transient hypereosinophilia, leukopenia/anaemia and increase in ALAT/alkaline phosphatases. In the treatment of *Wuchereria bancrofti* filariasis, the intensity of undesirable effects does not seem to be dose-dependent but is related to the microfilarial density in blood. The following have been described: fever, headache, asthenia, feeling of weakness, myalgia, arthralgia, diffuse pain, digestive disorders such as anorexia, nausea, abdominal and epigastric pain, cough, feeling of respiratory discomfort, sore throat, orthostatic hypotension, chills, vertigo, profuse sweating, testicular pain or feeling of discomfort.

Following administration of ivermectin in patients infected with *Onchocerca volvulus*, the hypersensitivity reactions observed resulting from microfilarial death pertain to Mazzotti-type reactions: pruritus, urticarial rash, conjunctivitis, arthralgia, myalgia (including abdominal myalgia), fever, oedema, lymphadenitis, adenopathies, nausea, vomiting, diarrhoea, orthostatic hypotension, vertigo, tachycardia, asthenia, headache. Rarely, these symptoms have been severe. A few cases of asthma exacerbation have been described. In these patients, abnormal sensation in the eyes, eyelid oedema, anterior uveitis, conjunctivitis, limbitis, keratitis and chorioretinitis or choroiditis have also been described. These manifestations, which may be due to the disease itself, have also been described occasionally after treatment. They were rarely severe and generally resolved without corticosteroid treatment.

Onset of conjunctival haemorrhage has been reported in patients with onchocerciasis. Observations of adult *Ascaris* expulsion have been described following ingestion of ivermectin. In patients with scabies, transient exacerbation of pruritus may be observed at the start of treatment.

#### 4.9 Overdose

Cases of accidental overdose with ivermectin have been reported, but none have resulted in fatalities. In cases of accidental intoxication with unknown doses of products destined for veterinary use (oral use, as an injection, cutaneous use), the symptoms described were rash, contact dermatitis, oedema, headache, vertigo, asthenia, nausea, vomiting, diarrhoea and abdominal pain. Other effects have also been observed, including seizures, ataxia, dyspnoea, paraesthesia and urticaria.

#### Management in case of accidental intoxication:

Symptomatic treatment and surveillance in a medical care setting with fluid replacement and hypertensive treatment, if necessary. Although there are no specific studies available, it is advisable to avoid combination of GABA agonists in the treatment of accidental intoxication due to ivermectin.

### 5. PHARMACOLOGICAL PROPERTIES

#### 5.1 Pharmacodynamics properties

Pharmacotherapeutic group: Anthelmintics, ATC code: P02CF01.

Ivermectin is derived from avermectins isolated from fermentation broths of *Streptomyces avermitilis*. It has high affinity with glutamate-gated chloride channels present in invertebrate nerve and muscle cells. Its binding to these channels promotes an increase in membrane permeability to chloride ions, leading to hyperpolarization of the neural or muscle cell. This results in neuromuscular paralysis and may lead to the death of certain parasites.

Ivermectin also interacts with other ligand-gated chloride channels such as the one involving the GABA neurotransmitter (gamma-aminobutyric acid).

Mammals do not have glutamate-gated chloride channels. Avermectins have only low affinity for other ligand-gated chloride channels. They do not readily cross the blood/brain barrier.

Clinical studies conducted in Africa, Asia, South America, the Caribbean and Polynesia reveal a reduction (to less than 1%) in *Wuchereria bancrofti* microfilaraemia in the week following administration of an oral ivermectin dose of at least 100 µg/kg. These studies showed a dose-dependent effect over the time during which the reduction in microfilaraemia and the infestation rate in the populations treated is maintained.

By treating microfilaraemia in man (the sole parasite reservoir for *Wuchereria bancrofti*), administration of mass treatment seems to be useful in terms of limiting the transmission of *Wuchereria bancrofti* by vector insects and interrupting the epidemiological chain.

Treatment with a single ivermectin dose of 200 micrograms per kg body weight has been shown to be effective and well-tolerated in patients with normal immunity and in whom infestation by *Strongyloides stercoralis* is restricted to the digestive tract.

## **5.2 Pharmacokinetic properties**

The mean peak plasma concentration of the major component (H2B1a) observed about 4 hours after oral administration of a single 12 mg dose of ivermectin in tablet form is 46.6 ( $\pm$  21.9) ng/mL.

The plasma concentration increases with increasing doses in a generally proportional manner. Ivermectin is absorbed and metabolised in the human body. Ivermectin and/or its metabolites are excreted almost exclusively in the faeces, whilst less than 1% of the administered dose is excreted in the urine. An *in vitro* study conducted on human liver microsomes suggests that cytochrome P450 3A4 is the main isoform involved in the hepatic metabolism of ivermectin. In humans, the plasma half-life of ivermectin is about 12 hours and that of the metabolites is about 3 days.

Preclinical studies suggest that ivermectin used at oral therapeutic doses does not significantly inhibit CYP3A4 (IC<sub>50</sub> = 50  $\mu$ M) or other CYP enzymes (2D6, 2C9, 1A2 and 2E1).

## **5.3 Preclinical safety data**

Single-dose toxicity studies conducted in animals showed toxicity to the central nervous system, as manifested by the appearance of mydriasis, tremors and ataxia at high doses in several species (mice, rats and dogs), as well as vomiting and mydriasis in monkeys. Following administration of repeated doses of ivermectin close or equal to maternotoxic doses, foetal abnormalities (cleft palate) were observed in several animal species (mice, rats, rabbits). From these studies, it is difficult to assess the risk associated with administration of a single low dose. Standard studies conducted *in vitro* (Ames test, mouse lymphoma TK assay) did not show any genotoxicity. Nevertheless, no genotoxicity or carcinogenicity studies were conducted *in vivo*.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

### **6.2 Incompatibilities**

Not applicable.

### **6.3 Shelf life**

### **6.4 Special precautions for storage**

Store below 30°C in a dry place. Keep all medicines out of reach of children.

**6.5 Nature and contents of container <and special equipment for use, administration or implantation>**

1x10 Tablets in a sachet placed in an outer carton with insert.

**6.6 Special precautions for disposal <and other handling>**

No special requirements.

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

**7. APPLICANT/MANUFACTURER**

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