

Ivermectin

Ivermectin is an antiparasitic drug with a broad spectrum of activity against various parasitic infections. Initially developed for the treatment of onchocerciasis, it has since been repurposed for a variety of dermatologic conditions, including scabies, head lice, and cutaneous larva migrans.

Mechanism of Action

Ivermectin is a macrocyclic lactone derived from *Streptomyces avermitilis*. The drug exerts its therapeutic effects by binding to specific glutamate-gated chloride channels in the nerve and muscle cells of invertebrates. This binding increases the permeability of the cellular membrane to chloride ions, leading to hyperpolarization of the cells. The resulting paralysis and subsequent death of the parasite are mediated by this disruption of normal cellular function. Notably, ivermectin has a preferential action on invertebrates, with minimal effects on human cells due to the differences in the cellular structure and chloride channels.

Clinical Uses

Ivermectin has been a cornerstone in the treatment of various parasitic infestations, both as a primary and off-label treatment.

➤ **Worm Infestations**

Historically, ivermectin has been the drug of choice for treating onchocerciasis (river blindness) and strongyloidiasis, caused by *Strongyloides stercoralis*. It has demonstrated high efficacy in clearing microfilariae and preventing the progression of these diseases.

➤ **Dermatologic Conditions**

In addition to its antiparasitic activity, ivermectin has been used off-label for several dermatologic conditions:

- Scabies: A single oral dose of ivermectin (200 µg/kg) has proven to be effective in treating scabies, including in immunocompromised individuals such as those with HIV/AIDS. For crusted scabies, more than one dose may be required.
- Head Lice: Ivermectin has been shown to be more effective than traditional treatments like malathion for head lice. A regimen of two doses, 7 days apart, is recommended at a dose of 400 µg/kg.
- Cutaneous Larva Migrans: Ivermectin is highly effective in halting the migratory tracks of *Ancylostoma* larvae within 48 hours of administration.
- Demodex Folliculorum: Ivermectin is increasingly used for treating rosacea-like symptoms caused by *Demodex folliculorum*, a type of mite associated with rosacea.

➤ **Topical Formulation**

The topical formulation of ivermectin is commonly used for the treatment of rosacea and

other mite-related conditions, such as *Demodex* infestation. It has a minimal systemic absorption profile, making it a safer alternative for localized treatment.

Dosage and Administration

Ivermectin is available in both oral tablet and topical lotion forms. For oral administration, it is typically taken on an empty stomach to maximize absorption. The recommended dose varies depending on the condition being treated:

- **For Onchocerciasis and Strongyloidiasis:** A single dose of 150-200 µg/kg is typically sufficient, although repeat doses may be necessary depending on the severity of the infestation.
- **For Scabies:** A single dose of 200 µg/kg is commonly used, though additional doses may be required for severe cases.
- **For Head Lice:** Two doses of 400 µg/kg, spaced 7 days apart, are recommended for optimal efficacy.

The topical formulation is typically applied once daily for several weeks, depending on the dermatologic condition.

Side Effects

Ivermectin is generally well tolerated, especially when used topically. However, side effects are more common with oral administration, particularly in patients being treated for onchocerciasis or other systemic filarial infections. These side effects include:

- **Common side effects:** Abdominal pain, muscle aches, dizziness, headache, nausea, sleepiness, tremors, edema, and malaise.
- **Topical side effects:** While side effects from topical ivermectin are rare, they may include local irritation such as burning, dry skin, and dandruff.

Severe or persistent side effects should be evaluated by a healthcare professional, particularly in patients receiving oral ivermectin for systemic parasitic infestations.

Contraindications and Precautions

Ivermectin is contraindicated in children under 5 years of age and in individuals weighing less than 15 kg due to the lack of sufficient safety data in these populations. Its use during pregnancy is classified as Category C, meaning that it should be used only if the benefits outweigh the potential risks to the fetus.

Conclusion

Ivermectin remains a highly effective antiparasitic treatment, especially for parasitic worm infestations such as onchocerciasis and strongyloidiasis. It has also become a valuable option for various dermatologic conditions, including scabies, head lice, and *Demodex folliculorum* infestations. The development of both oral and topical formulations allows for flexibility in

treatment. While side effects are generally minimal, close monitoring is advised, particularly when used systemically. Further research and clinical trials continue to explore the broader applications of ivermectin in dermatology and parasitology.

References

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