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Fractional laser assisted cutaneous drug delivery

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Therapeutic efficacy of topical drugs depends on their ability to penetrate different skin layers. Topical drugs have a poor total absorption with only 1%-5% bioavailability. The major rate-limiting step for drug absorption is passage through the stratum corneum, which is impermeable to hydrophilic and large molecules greater than 500 Da. Currently, available strategies that overcome the skin barrier include chemical biomodulation and physical techniques. Physical drug delivery systems include microdermabrasion, microneedling, radiofrequency, sonophoresis, electroporation, iontophoresis, and laser. The most commonly fractional laser systems used in drug delivery include fractional Er:YAG laser 2940 nm, fractional CO₂ laser 10600 nm, and fractional Er:glass laser 1550 nm. I show clinical studies to use this facility for multiple indications including non-melanoma skin cancer, onychomycosis, vitiligo, alopecia, scars, warts, infantile haemangiomas and cosmetic purposes. Optimal laser parameters and pharmacokinetics of the drug should be taken into consideration to reach the best results of this modality of drug delivery. Researches in this field are rising; both in dermatologic and systemic scope.

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Oral albendazole is effective against phthiriasis palpebrarum

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Introduction: Treatment of Phthiriasis palpebrarum is based on the mechanical ablation of lice and nits after topical vaseline application, shaving of the eyelashes, oral ivermectin administration, application of pilocarpine gel, fluorescein drops, yellow mercury oxide ointment, permethrin cream, lindane lotion or malathion shampoo. The emergence of resistant strains, the risk of major eye damage and the favorable benzimidazole outcomes in pediculosis capitis and pubic phthiriasis, prompted us to use albendazole against ciliary phthiriasis. We report a case of ciliary phthiriasis resistant to several therapeutic modalities having responded to albendazole per os.

Observations: A seven year child with no significant personal or family history was seen in our outpatient clinic for ocular pruritus. The diagnosis of ciliary phthiriasis was made on the physical examination, which identified the presence of small brownish crusts at the base of the eyelashes, associated with visible lice and nits. The patient was previously treated with several local applications of permethrin 1% cream and a daily occlusive treatment with vaseline for 2 weeks, with no significant result. Due to the absence of ivermectin, a dose of 400 mg of albendazole per os was administered to the patient (J0), and repeated after seven days (J8). Complete resolution of the clinical signs and symptoms was noted. No recurrence was observed after a six month follow-up. Since the presence of ciliary phthiriasis may indicate possible sexual abuse, the hospital's social service was informed for investigations.

Discussion: Albendazole inhibits polymerization of tubulin into microtubules and has a high affinity for parasitic tubulin, sparing those of the mammalian hosts. Loss of cytoplasmic microtubules alters glucose absorption by larvae and helminths, causing a decrease in ATP and energy depletion, resulting in the immobilization and death of the parasite. The principle of oral albendazole is based on the intake of a blood meal containing the insecticide. For this reason the nits are not affected and the treatment must be repeated after 7 days. Given its price, safety, rare and limited side effects, albendazole could be considered as a therapeutic option in ciliary phthiriasis.

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