(wavelength, 10 600 nm). Wound healing did not show any complication, and after 2 years of follow-up, there was no sign of recurrence of chromomycosis.

To the best of our knowledge, this is the third report of CO₂ laser therapy for chromomycosis. ⁴ Up to now, for localized initial lesions, surgical excision is recommended with removal of a safe margin. In cases of extensive disease, a long-term (1 year and more) systemic antifungal drug treatment is recommended with cure rates up to 91%. However, due to the high costs of these antifungal drugs, this regimen is often performed only insufficiently and stopped before complete healing can be reached, especially in developing countries. These factors result in high recurrence rates. Additionally, long-term, high-dose systemic treatment may show side effects with liver and kidney toxicity. Required blood controls again increase the costs for that treatment.

These arguments show the strong need for new treatment modalities. A recently reported pulse itraconazole regimen (400 mg daily for 7 days per month over 1 year) seems to be more economical and was associated with better compliance. ¹ New second-generation triazoles (voriconazole, ravuconazole, posaconazole) with in vitro activity against the black fungi may play a role in the treatment of chromomycosis. Furthermore, combined azole (itraconazole) and allylamine (terbinafine) therapy with different targets and synergistic effects is an interesting perspective. ⁶ During the last decades, cryosurgery has been reported as an alternative therapeutic modality with promising results, sometimes in combination with itraconazole. ⁷ Cryosurgery is technically relatively easily performed but freezing time and depth of freeze are not standardized. Another alternative is topical heat application that, however, often only improves but does not heal the disease. ¹

In consideration of the mentioned treatment possibilities, CO₂ laser seems to be an interesting alternative for the treatment of well-defined localized lesions of chromomycosis. Its advantages are the necessity of only one single treatment procedure that improves patients’ compliance. Furthermore, the costs of a single treatment are relatively low. Finally, there are no systemic toxicities.

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References

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Personalized medicine: a world of opportunities in skin diseases

Editor

Painkillers ... vaccines ... antibiotics ...: will personalized medicine unfold as the next revolutionary healthcare advance?

Traditionally, physicians initiate therapy with a standard dose and observe how the patient responds. If necessary, therapy is modified by ‘trial and error.’ Why drug therapy fails in some patients or populations, and why some patients experience serious side effects, was unclear. Although it was suspected that genetics may be involved in specific medication responses, research had identified only a few genetic variations that are relevant.

Today, physicians are more aware that genetic background can cause variation in patients’ responses to the same drug dose. This concept is being developed into personalized medicine: using a person’s genetic information to improve disease treatment, diagnosis and prevention.

Scientists have already identified a huge number of genetic variations that relate to disease risk or drug response. Researchers are using this information to predict whether a medicine might be effective, ineffective or toxic.
for certain individuals. The best example of such genetic tests is the cytochrome P450 (CYP450) test. The CYP450 enzyme family, regulated by the CYP450 gene, is primarily responsible for drug metabolism in hepatic and extrahepatic tissues including skin. One of these drugs is warfarin, a coumarin anticoagulant used worldwide for the treatment and prevention of thromboembolic disease. Its narrow therapeutic index and wide interindividual response variability complicate the management of warfarin therapy. Therefore, screening patients for the presence of CYP450 genetic variations responsible for altered warfarin metabolism may allow proactive dose adjustment. In fact, in 2005, the Food and Drug Administration recommended warfarin label changes be made to include genomic and test information. Other personalized medicine applications are already in drug labels and include [e.g., the HER-2 Neu test in breast cancer (Herceptin, package insert) and the UGT1A1 gene in colon cancer (Camptosar, package insert)].

There should be no more delay in investigating this approach for managing dermatologic drugs. As part of their barrier function, the CYP are the most important drug-metabolizing enzymes in the skin. In fact, few drugs used by dermatologists escape interaction with CYP enzymes. As with other organs, it has been shown that expression levels of specific CYP enzymes in the skin vary markedly among individuals. If these variations are shown to be associated with individual drug responses, dermatology will be poised to join other disciplines already in the personalized medicine arena.

For example, one CYP450 substrate is retinoic acid (RA), which is indicated for treatment of recalcitrant nodular acne vulgaris and for which off-label uses for other conditions including cellulitis are frequently reported. RA can also cause serious side effects, including psychiatric disorders, pseudotumour cerebi, pancreatitis and hepatotoxicity. Tetracycline, used for common skin diseases including acne vulgaris and rosacea, is also metabolized by CYP450. Tetracycline can also be associated with serious side effects such as autoimmune syndrome, photosensitivity, pseudotumour cerebi, increased blood urea nitrogen A, and haemolytic anaemia. If it is shown that differing metabolism of these and other dermatologic drugs can be linked to specific CYP enzyme variants, patients could be tested and doses could be tailored accordingly. This capability would be particularly important if it could be used to predict and prevent potentially life-threatening adverse reactions such as toxic epidermal necrolysis and atypical melanocytic lesions.

In summary, dermatologists face the same drug prescribing challenges encountered by physicians in other specialties. The precedent has been set for using genetic-based personalized medicine to overcome some of these challenges. It is time to prioritize investigation and development of genetic tests in dermatology, and CYP450 is a logical place to start.

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References


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