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Diagnosis at first sight

Sunburn despite sunscreen

Quemaduras solares a pesar de protección solar

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Case report

We present the case of a 90-year-old man with a medical history of high blood pressure, hypercholesterolaemia and a pacemaker for third-degree atrioventricular block who attended Accident & Emergency with a two-day history of fever of up to 38 °C associated with oedema in the lower limbs and dyspnoea on minimal exertion, with orthopnoea and paroxysmal nocturnal dyspnoea. In the initial assessment, he was found to be haemodynamically stable, with fever of 38.1 °C and oxygen saturation of 90% on room air. Auscultation of the heart revealed a holosystolic murmur at the left sternal border, while lung auscultation identified crackles up to the middle lung fields, and the patient had pitting oedema in the lower limbs up to his knees. Given the findings of heart failure, he was admitted to hospital. Methicillin-sensitive *Staphylococcus aureus* was isolated in two out of two blood cultures of samples taken in Accident and Emergency. Tests were completed with a transthoracic echocardiogram, which revealed vegetation on the pacemaker lead. He was treated with oxacillin for six weeks. Due to the high surgical risk and life-threatening situation, a multidisciplinary meeting decided on suppressive therapy with doxycycline 100 mg every 12 h, for which he was advised to wear sun protection with sunscreen and clothing covering his arms and legs. The sun protection used by the patient contained oxybenzone as sunscreen. One week after starting the treatment and using the recommended sun protection, the patient noticed a burning sensation and erythema on his scalp and hands. The erythema became worse and blisters appeared on his hands, with pain ranging from moderate to severe. Physical examination showed first- and second-degree burns on the patient's scalp (Fig. 1) and the back of both hands (Fig. 2). The patient was subsequently diagnosed with doxycycline-induced phototoxicity.

Fig. 1. First- and second-degree burns on the scalp.

Progress

The doxycycline was reduced to 100 mg once a day. He was advised to limit sun exposure time, use a sunscreen with zinc oxide and wear a hat. The patient made a full recovery, with no residual pigmentation.

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Fig. 2. First- and second-degree burns on the back of both hands.

Closing remarks

The main dermatological side effect of doxycycline is photosensitivity. After 24 h of intense sun exposure, a burning sensation is felt and erythema appears on the exposed areas[1]. Slightly palpable erythematous plaques then appear, possibly accompanied by small papules[1,2]. In severe cases, up to 80% of the body may be affected[1]. The symptoms resolve within 10–14 days after stopping the treatment and avoiding exposure to the sun[2]. Layton and Cunliffe[2] treated 106 patients with acne with doxycycline (150 or 200 mg/day) for two years; 20% of those treated with 150 mg of doxycycline/day and 42% who received 200 mg/day developed phototoxicity. The authors concluded that it was a dose-dependent effect. In the case we present here, the patient developed phototoxicity despite following sun protection measures. Oxybenzone absorbs radiation in the 340 nm–360 nm wavelength region, while the wavelength associated with doxycycline phototoxicity is UVA 1, which fluctuates between 340 nm and 400 nm, meaning the protection provided to the patient is inadequate, and that may explain the burns despite following the sun protection recommendations. We believe that this case puts the spotlight on an important factor to be taken into account to avoid an adverse effect that is widely known by clinicians. There is some debate about oxybenzone in terms of repercussions on health, because *in vitro* it has anti-androgenic and pro-oestrogenic effects, and skin absorption has also been demonstrated. As a result, some consider it to be a disruptive chemical for the endocrine system. However, as absorption is limited, it probably does not represent a risk. It has also been demonstrated that oxybenzone dissolved in the sea is toxic to corals.

One strategy for promoting adherence to the recommendation on using sunscreens that may effectively prevent doxycycline photosensitivity is to use sunscreens labelled as “coral-friendly” or “ocean-friendly”. However, in addition to sun protection creams, sun-safe behaviour and wearing clothing that prevents further exposure are useful tools in preventing phototoxicity[1,3].

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Conflicts of interest

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