



FOCUS ON RESEARCH

IMPACT ASSESSMENT OF COMPACT FLUORESCENT LAMPS AND LIGHT EMITTING DIODES ON PATIENTS WITH LIGHT-SENSITIVE SKIN DISORDERS

Researchers

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Aim

The purpose of the study was to investigate the effect of light from compact fluorescent lamps (CFLs) and light emitting diodes (LEDs) on the skin of patients with a light-sensitive skin disorder. These conditions include chronic actinic dermatitis and porphyria. The aims were (i) to measure the ultra-violet (UV) emissions from 120 CFLs and LEDs and (ii) to investigate the response of the skin from direct exposure to one or more types of CFL or LED on 60 patients. Both of these aims were exceeded.

Project Outline/Methodology

UV Measurements. Samples of CFLs and LEDs were obtained from two sources. One was from the Lighting Industry Federation (LIF) which is a trade organisation. In addition, lamps were sourced from local retailers including ASDA, B&Q and Wickes. UV emissions were measured in the Photobiology Unit UV calibration laboratory, which is an accredited UV measurement laboratory.

Patient Sensitivity. On average, each week six patients attend the Photobiology Unit for assessment of suspected photosensitivity. They are routinely exposed to a range of light sources to test their sensitivity. In addition to the lamps that were currently used, they were tested against CFLs and LEDs using the forearm. This formed part of their investigation and was carried out to allow advice to be given on their safe exposure limits.

Key Results

UV Measurements. UV measurements were carried out on 280 lamps. Two types of CFL were identified, one designated single envelope and the other double envelope. The latter have a protective cover around the lamp. In general, single envelope CFLs were found to emit much higher levels of UV radiation, including short wavelength UV radiation, than double envelope CFLs. LEDs had minimal UV levels. A third type of lighting, known as energy efficient halogen lamps (EEHs) were shown to emit UVA (long wavelength UV) at levels that

may provoke a reaction in the skin of UVA sensitive individuals.

Patient Sensitivity. A total of 301 patients were tested. Results of the *in vivo* skin testing showed that skin reddening (erythema) was induced in 31% of actively photosensitive patients on exposure to light from a single envelope CFL. By contrast no patients tested positive to UV emission from an LED, although one patient with visible (not UV) light sensitivity reacted to the visible component.

Conclusions

It was concluded that double envelope CFLs are a safer alternative than single envelope CFLs for photosensitive individuals, and that LEDs may be the safest option.

What does this study add to the field?

We have provided evidence that light from CFLs may provoke a reaction in the skin of patients with light-sensitive skin disorders. Patients are advised to avoid exposure to light from single envelope CFLs. Double envelope CFLs are less likely to be problematic. We have also shown that LEDs offer a safer alternative for photosensitive patients

Implications for Practice or Policy

We now advise patients on the most suitable form of light for their condition. Routine phototesting to CFLs is available in the Photobiology Unit on request. Lamp manufacturers should provide information to enable health professionals to advise patients regarding lamp types that are less likely to be harmful.

Where to next?

We have produced a policy statement on the impact of energy efficient lighting on patients with light-sensitive skin disorders for the British Association of Dermatologists. We are also studying the particular needs of patients with lupus who are sensitive to UV.

Further details from:

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