Mass photokeratitis following exposure to unprotected ultraviolet light
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Summary
We report a cluster of patients developing photokeratitis as a result of exposure to unprotected UV-B light source. The incident occurred at a cattle livestock market auction where the light source protective covers of mercury vapour lamps were damaged because of vandalism. The incident was investigated by the District Council as a public health and safety issue. This report stresses the hazards of ultraviolet lamps routinely used in public places and the need for proper maintenance of these light sources.

Keywords: UV radiation, eye, keratopathy

Exposure to ultraviolet light may cause a superficial punctate keratopathy that appears up to 6 h after exposure. The condition is most frequently encountered as ‘welder’s flash’, caused by even momentary exposure to arc welding.

Case report
In October 1999 150 people attended a cattle market held at Bishop’s Castle in Shropshire. The usual lighting had been vandalized. The incident was reported to the police, who noted that the two ceiling mounted lamps had been damaged. From 2 h after the event 50 people from the auction presented at the local casualty department complaining of sore and red eyes. All patients were found to have facial erythema and bilateral punctate corneal erosions, an appearance similar to that seen in welder’s ‘arc eye’. The facial erythema gradually resolved with peeling of the skin. The corneal changes also improved with topical lubricant drops. There were no long-term injuries.

Comments
Based on the biological effects of the various wavelengths or bands, ultraviolet radiation has been subdivided into three bands: UV-A (400–320 nm), UV-B (320–290 nm) and UV-C (290–100 nm). UV-B causes sunburn (painful erythema and blistering) and skin cancer. UV-C, which is germicidal and may also cause skin cancer, comes entirely from artificial sources such as germicidal ultraviolet lamps or arc welding. Clusters of photokeratitis have been reported in association with defective glass envelopes surrounding mercury vapour lamps, most frequently in school gymnasiums. Naturally occurring UV-B in sufficient doses also causes photokeratitis. Ultraviolet waves are generally absorbed by the conjunctiva and cornea and can cause conjunctivitis and keratitis. If the waves are of sufficient power (e.g. ultraviolet laser) they can reach the lens. Superficial punctate keratitis frequently follows overzealous use of sunlamps. One characteristic of such ultraviolet injury is a latent period of several hours between exposure and effect, in contrast to direct thermal injury, in which there is no latent period between application of energy and resultant effect. Corneal epithelial cells will usually begin to die after a period of several hours following irradiation and then are brushed off by the action of blinking or undergo spontaneous fragmentation. This exposes a number of bare nerve endings around each missing cell and results in excruciating pain. Following regeneration of corneal epithelial cells, such eyes are often light-sensitive for periods of many months.

To our knowledge this is the first example of mass exposure to ultraviolet light in the UK. An enquiry into the incident by Shropshire District Council revealed two damaged 700 watt High Pressure Mercury lamps (MBF) as a source of ultraviolet radiation. The outer fluorescent protective envelope was missing, directly exposing the discharge (arc) tubes emitting UV-B radiation.

This report highlights the hazards of ultraviolet lamps used in public places and as sunlamps. These lamps should not be used if the outer envelope is damaged.

References
5 Accident investigation at the Bishop’s Castle Livestock Market. Environment and Development Department, Shropshire District Council, October 1999.

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