

Histological Changes from UVB Induced Damage in hairless mouse undergoing to Hyperbaric Oxygen.

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According to a mechanistic standpoint, light-induced dermatopathologic changes can be divided into phototoxic and photoallergic categories. Phototoxic skin damage results from direct interaction of irradiation with subcellular targets while photoallergic reactions pivot around immunomodulation of cutaneous photoreactivity. Both variants require initiation by exogenous light, but subsequent cytopathologic mechanisms may be substantially different. For our experimental purpose, we have used wavelenghts from 290 to 320 nm, classified as ultraviolet B (UVB), or mid-UV. The chronic UV exposure is linked to hydrotopic degeneration of basilar cells, epidermal edema (spongiosis), perivascular lymphohistiocytic infiltrates in the superficial dermis, increased production of elastic fibers and glycosaminoglycans, accelerated breakdown and synthesis of collagen and inflammation. We have studied the possibility of repairing or returning the skin to a more normal state in animals treated with UVB irradiation and undergoing to prolonged exposure of high oxygen tensions of 2 atmospheres (atm).

Materials and methods.

Male albino hairless mice ype Skh:HR-I, were used. One group of 8 mice were irradiated three times per week with a bank of four Westinghouse FS-40 sunlamps, to a distance of 45 cm from the backs of the animals. All the eight animals were individually exposed to the minimal dosage required (MED) to yield the presence of edema, erythema or petechia in irradiated skin 48 hours following UVB exposure, we used: 1/2 MED (197 mJ / cm²) three times per week for 10, 15 and 25 weeks. During this treatment they were exposed, daily, for 60 min. to Hyperbaric Oxygen treatment (H.B.O.) with 3 absolute O₂ atm. in a cylindrical steel chamber 40 cm diameter x 65 cm length (Galeazzi model-Italy). The second group of eight animals, after UVB irradiation, hadn't H.B.O. treatment. Animals were biopsied while under an anaesthetic administered intra-peritoneally and skin fixed in 10% formalin, embedded in paraffin and sectioned at 6 to 10 µm. Sections were stained with H e E, Luna's aldehyde fuchsin for elastin, Pinkus' acid orcein-giemsma for elastin, Van Gieson's for collagen, and Mowry's colloidal iron for glycosaminoglycans.

Results and Discussion.

Our results show hystological pictures of better repair in that group of animals during UVB damage and undergoing H.B.O. This group show better recovery of visual and histological skin structure than the control group. H.B.O., seems to reduce the UV-injury and maintain dermal elements viability, which leads to more rapid epitheliazation.

References.

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