

A-4 Epidemiological approaches to the effects of increased ultraviolet sun exposure on human health

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Total Budget for FY1996-1998 150,740,000 Yen (FY1998; 54,466,000 Yen)

Key Words Epidemiology, Ultraviolet exposure, Skin cancer, Solar keratosis, Cataract

The health effects of increased ultraviolet exposure is one of the most important study areas in relation to the increased ultraviolet exposure due to ozone depletion. In our studies, the prevalence of solar keratosis, a pre-malignant precursor lesion of the skin, and cataract was found to be higher in areas where UV-B exposure level is higher. These studies clearly showed that the risk of the increased ultraviolet exposure due to ozone depletion should be assessed and preventive measures should be considered in Japan. The lifestyle such as outdoor activities and use of sunglasses and shades was found to be important for exposure assessment. One of our studies revealed that the effect of ultraviolet exposure on cultured cells is more prominent when the cells are exposed to ultraviolet of lower intensity with longer duration, even if the total dose is the same. This clearly shows that the intensity and duration are important factors for the risk assessment of ultraviolet exposure. Our studies also revealed that the infection of mice to malaria is influenced by ultraviolet exposure, suggesting that the immunity could be affected by ultraviolet exposure. Epidemiological studies should be conducted with special focus on the role of infection and immunity in the future.

In conclusion, the following results were obtained:

- 1) The risk of skin cancer and solar keratosis is related to ultraviolet exposure in Japan.
- 2) The risk of cataract is related to ultraviolet exposure in Japan.
- 3) The impaired immune function by ultraviolet exposure might also be related to certain diseases such as infectious diseases.
- 4) For effective prevention of these diseases, the lifestyle such as outdoor activities and use of sunglasses and shades should be taken into consideration.
- 5) Basic in vitro and in vivo research showed that the health effects of ultraviolet exposure differ by the duration of exposure and co-existing exposures to chemicals. These results should also be utilized to establish effective preventive measures.