16. Effect of Deep Sea Water on skin DNA damage by Ultraviolet Exposure

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1. Introduction

Skin is an important barrier protecting body from the environmental stresses, such as air, pollutants, sun light and physical and chemical damages. Ultra violet light (UV) is the major cause of skin aging, skin inflammation and skin cancer. Here, we investigated the effects of deep sea water (DSW), which has variable physiological activity, on UVB (wave length: 312 nm)-induced skin damage in HaCaT human keratinocyte.

2. Methods

HaCaT human keratinocytes were routinely cultured in Dulbecco's modified Eagle's Medium (DMEM) contained 1% antimycotic/antibiotic solution and 10% fetal bovine serum. To radiate UV, cells were washed twice with phosphate buffered saline (PBS) and were layered with PBS. VL-6.LM UV lamp (wavelength 312 nm) was used for UVB radiation and the radiation was performed at 15-cm distance for 30 s in dark box. Cells were further cultured in FBS-free DMEM for 2 h or 24 h. The intensity of UVB at 15-cm distance was 580μJ/cm2.

3. Conclusion

The result showed that DSW promoted UVB-induced cell death. Futhermore, the promotion of cell death by DSW was correlated with the decrease of RAD51 and survivin expression induced by UVB. In addition, autophagic marker LC-3II expression was dose-dependently increased by DSW treatment. In contrast, mTOR (mammalian target of rapamycin) and its down stream factors, S6K and S6, phosphorylation were regressed by DSW. It implies that DSW enhances autophagic cell death of UVB-damaged keratinocytes. In conclusion, the results suggest that DSW may be used as a potent preventive substance on skin cancer development through the removal of UVB-damaged skin cell by autophagy.

4. References

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