IJAE
Vol. 123, n. 1 (Supplement): 195, 2018
ITALIAN JOURNAL OF ANATOMY AND EMBRYOLOGY

In vitro effects of curcuma longa on human keratinocytes derived from ophthalmic pterygium

Silvia Sancilio[1], Gianmarco Stati[1], Mariangela Basile[1], Lucia Centurione[1], Maria Antonietta Centurione[2] and Roberta Di Pietro[1]

[1] "G. d'Annunzio" University", Department of Medecine and Aging Sciences, Chieti-Pescara, Italia (1)
[2] "G. d'Annunzio" University, Genetic Molecular Institute of CNR, Unit of Chieti, Chieti-Pescara, Italia (2)

Pterygium is an ophthalmic pathology characterised by fibro-vascular overgrowth arising from sub-conjunctiva tissue that migrates toward the cornea. Ocular pterygium is usually a bilateral pathology of bulbar conjunctiva, generally located at the nasal side and, occasionally, at the temporal side of conjunctiva [1]. Despite its benign nature, due to its progressive growth the pterygium can invade cornea, reduce visual function leading eventually, to blindness [2]. Currently, the only treatment available is surgical. It has been demonstrated by our research group that low doses of Curcuma longa are capable of inhibiting proliferation of keratinocytes migrated from explants of human pterygium cultured in vitro. To evaluate the in vitro effects of Curcuma longa on human pterygium-derived keratinocytes, pterygium explants were placed in a 6-well plate in complete medium and migrated keratinocytes were treated with an alcoholic extract of 1.3% Curcuma longa in 0.001% Benzalkonium Chloride for 3, 6, and 24 h. Cultured cells were examined for CAM5.2 (anti-cytokeratin antibody) and CD140 (anti-fibroblast transmembrane glycoprotein antibody) expression between 3th and 16th passage to assess cell homogeneity. TUNEL technique and Annexin-V/PI staining in flow cytometry were used to detect keratinocyte apoptosis. We showed that Curcuma longa exerts a proapoptotic effect on pterygium-derived keratinocytes already after 3 h treatment. Moreover, after 24 h treatment, Curcuma longa induces a significant increase in TUNEL as well as Annexin-V/PI positive cells in comparison to untreated samples. Our study confirms previous observations highlighting the expression, in pterygium keratinocytes, of nuclear VEGF and providing the evidence for the first time to the expression of nuclear and cytoplasmic VEGF-R1. These findings suggest that Curcuma longa could have some therapeutic potential in the treatment and prevention of human pterygium.

This work was performed with funds of the Italian Ministry of University and Research granted to Professor Roberta Di Pietro and Professor Marco Ciancaglini in 2009, 2010, and 2017.

This work was supported by grants from MIUR FIRB 2010 and MIUR PRIN-2009.

References

[1] Di Girolamo (2004). Pathogenesis of pterygia: role of cytokines, growth factors, and matrix metalloproteinases. Prog Retin Eye Res. 23(2):195-228
[2] Detorakis & Spandidos (2009) Pathogenetic mechanisms and treatment options for ophthalmic pterygium: trends and perspectives.Int J Mol Med. 23(4):439-47.

Key words

Human pterygium-derived keratinocytes, Curcuma longa, VEGF, VEGF-R1, apoptosis.