Commentary: Expression of p53 and Ki-67 proteins in patients with increasing severity and duration of pterygium

Pterygium is considered to be a degenerative disease of the conjunctiva; however, the exact etiology remains to be elucidated. Ultraviolet (UV) light exposure has been found to have strong association. Lately, the presence of tumor markers in pterygium reinforce the hypothesis that this lesion is similar to tumor.[1] The expression of Ki-67 protein in association with the expression of p53 protein in pterygium from earlier reports points towards the hypothesis of pterygium as tissue growth disorder.[1] There levels have also been found to be higher in recurrent pterygium samples;[2] p53 is a tumor-suppressor gene and its mutation has been implicated in the genesis of malignant neoplasms especially, UV-induced skin tumors such as Basal cell carcinomas. Inactivation of p53 function removes an obstacle to increase the proliferation.[3] The high expression levels of p53 observed in the laboratory studies contradict the fast-growing nature of pterygium. It is believed to be due to missense mutation in p53 gene.[4] Factors affecting the prevalence of p53 expression in pterygium deserve investigation. The increased proliferative activity is commonly seen in the epithelium of pterygium. Mouse double minute 2 (MDM2), a TP53-binding protein, contributes to the inhibition of TP53 activity in human pterygium.[5] Thus, disruption of the MDM2-TP53 interaction could attenuate human pterygium cell growth. The Ki-67 protein is a cellular marker for proliferation and is present during all phases of the cell cycle (G1, S, G2, and mitosis) but is absent in resting cells (G0).[6]

Authors[7] in the current study have classified pterygiums into mild, moderate, and severe using only the radial and limbal extent of pterygium and not taken other characteristics such as vascularity, conjunctival tissue thickness, corneal tissue thickness, and pigment at the leading corneal edge into consideration.[8] The classification seems quite arbitrary. Though there was present overall increased expression of p53 (33 of 43 cases) 76.74% and Ki -67 (33 of 43 cases) 76.74%, no significant correlation could be detected with the severity and duration of the pterygium. The major limitation of the study being markedly nonuniform distribution of pterygium cases according to the criteria taken for the severity. Expression of these biomarkers from the healthy conjunctiva would also have added to more information. Classification of pterygium based on the above additional characteristics could have given better baseline parameter and more statistically significant findings of proliferative and antiapoptotic markers and their correlation with severity and duration of pterygium. However, overall high expression of these markers in this study supports the concept of antiapoptotic mechanisms, and proliferation playing an important role in the etiopathogenesis of pterygium. Thus, the role of adjunctive therapies in the form of antimetabolites such as mitomycin C and 5-flurouracil, antivascular endothelial growth factors, photodynamic therapy, conjunctival grafts, and may be MDM2 antagonists to lower the recurrence rates after the treatment of pterygium becomes important.

Ritu Arora

Guru Nanak Eye Center, Maulana Azad Medical College, New Delhi, India

Correspondence to: Dr. Ritu Arora, Guru Nanak Eye Center, Maharaja Ranjit Singh Marg, New Delhi - 110 002, India.
E-mail: dr_rituarora@yahoo.com

References

1. Ljubojević V, Gajanin R, Amidzić L, Vujković Z. The expression and significance of p53 protein and Ki-67 protein in pterygium. Vojnosanit Pregl 2016;73:16-20.
2. Turan M, Turan G. Bcl-2, p53, and Ki-67 expression in pterygium and normal conjunctiva and their relationship with pterygium recurrence. Eur J Ophthalmol 2020. doi: 10.1177/1120672120945903.
3. Khodaeiani E, Fakhrjou A, Amirnia M, Babaeinezhad S, Taghvamanesh F, Razzagh-Karimi E, *et al*. Immunohistochemical evaluation of p53 and Ki67 expression in skin epithelial tumors. Indian J Dermatol 2013;58:181-7.
4. Nigro JM, Baker SJ, Preisinger AC, Jessup JM, Hostetter R, Cleary K, *et al*. Mutations in the p53 gene occur in diverse human tumour types. Nature 1989;342:705-8.
5. Young AL, Cao D, Chu WK, Ng TK, Yip YWY, Jhanji V, *et al*. The evolving story of pterygium. Cornea 2018;37:S55-7.
6. Bullwinkel J, Baron-Lühr B, Lüdemann A, Wohlenberg C, Gerdes J, Scholzen T. Ki-67 protein is associated with ribosomal RNA transcription in quiescent and proliferating cells. J Cell Physiol 2006;206:624-35.
7. Mahesh M, Mittal SK, Kishore S, Singh A, Gupta N, Rana R. Expression of p53 and Ki-67 proteins in patients with increasing severity and duration of pterygium. Indian J Ophthalmol 2021;69:847-50.
8. Johnston SC, Williams PB, Sheppard JD Jr. A comprehensive system for pterygium classification. Invest Ophthalmol Vis Sci 2004;45:2940.

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