Relative quantification of human B-defensins gene expression in pterygium and normal conjunctiva samples

ABSTRACT

The human ocular surface produces highly conserved cationic peptides. Human β-defensins (HBDs) serve an important role in innate and adaptive immunity. They are primarily expressed in epithelial cells in response to infection and provide the first line of defence against invading microbes. Defensin β1 (DEFB1) is constitutively expressed and regulated by inflammatory mediators including interferon-γ, lipopolysaccharide and peptidoglycans. DEFB4A is locally induced in response to microbial infection while DEFB109 is induced via Toll-like receptor 2. The present study examined the expression of the HBD DEFB1, DEFB4A and DEFB109 genes in pterygium. The pterygium tissues and normal conjunctiva samples were obtained from 18 patients undergoing pterygium surgery. The reverse transcription-quantitative polymerase chain reaction method was employed to determine the expression of DEFB1, DEFB4A and DEFB109 genes. The results revealed that the expression of DEFB1 and DEFB4A was significantly higher and upregulated in pterygium samples when compared with normal conjunctiva samples from each patient ($P<0.05$), while the expression of DEFB109 was observed to be lower in pterygium samples when compared with normal samples from the same patient. Previous studies have revealed that DEFB1 and DEFB4A genes are present in low concentrations inside the human eye, and they are upregulated during the maturation of keratinocytes, suggesting a possible role in cell differentiation. The DEFB109 gene is present in higher concentrations inside the human eye, though it is newly discovered. It has also been reported that DEFB1 may be involved in carcinogenesis epithelial tumours. Collectively, the current data suggests that HBDs may serve a crucial role in the pathogenesis and development of pterygia, and thus may be considered as novel molecular targets in understanding pterygia development.