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The analysis of adipogenesis and inflammatory response in orbital fibroblast from adult and pediatric graves' ophthalmopathy

Abstract:

This study is to elucidate the differences in clinical characteristics between pediatric and adult patients with Graves' ophthalmopathy based on cellular and molecular level differences by examining the inflammatory response and adipogenic differentiation in orbital fibroblasts harvested from pediatric and adult patients with Graves' ophthalmopathy in response to the proinflammatory cytokine (IL-1β).

Method: Orbital fat tissue was harvested from, healthy adults, healthy pediatric individuals, and adult patients with Graves' ophthalmopathy, and orbital fibroblasts were cultured from these samples. IL-1β was administered at the early stage of adipogenic differentiation in orbital fibroblasts, followed by the exchange of adipogenic differentiation medium for 14 days. The expression levels of PGE2, COX-2, PPAR-γ, C/EBP-α, and C/EBP-β were measured on days 1, 3, 5, 10, and 14 during differentiation to assess the inflammatory response and adipogenic differentiation with Western Blotting and RT-PCR. Adipogenic differentiation was additionally confirmed with Oil-red O staining.

Result: Expression of PGE2, COX-2 was higher in healthy child and adult patients than in healthy adult, respectively. Expression of PGE2, COX-2 after IL-1B was more enhanced in all groups.

Conclusion: Compared to adults, orbital fibroblasts in pediatric patients may exhibit a more active inflammatory response and adipogenic differentiation, and they may be more sensitive to inflammatory conditions, potentially leading to enhanced differentiation into adipocytes. When managing and developing treatment strategies for pediatric and adult patients with Graves' ophthalmopathy, it will be necessary to adopt a personalized approach that takes into account the biological characteristics of each group.

Biography

Ahn has completed his PhD at the age of 35 years from Pusan National University and studied oculoplastic and reconstructive surgery over 18 years. He had clinical research in University of Washington, Seattle, USA for one year, in Japan and China. He is the chief professor in Pusan National University of Ophthalmology, Division of Oculoplastic and Orbital Surgery. He has published more than 15 papers in SCIE journals and has been serving as an editorial board member of global ophthalmology journal.