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Galectin-1 and Galectin-3 Expression in Lesional Skin of Patients With Systemic Sclerosis-Association With Disease Severity

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Abstract

Galectin-1 (Gal-1) and galectin-3 (Gal-3) are carbohydrate-binding proteins involved in normal processes, autoimmunity, and cancer. Increased serum Gal-3 levels in scleroderma were associated with active disease, vasculopathy, and mortality.

Objectives: The aim of this study was to evaluate Gal-1 and Gal-3 expression in the lesional skin of patients with scleroderma regarding disease severity and organ involvement.

Methods: A cross-sectional study was conducted on patients diagnosed as systemic sclerosis (SSc), after informed consent. Clinical and serological profiles were reviewed from medical records. Lesional skin biopsies were taken by losange incision from patients. Samples were analyzed by immunohistochemistry and compared with normal skin of a healthy patient. Parametric statistical analysis was done with Student t test and Pearson coefficient. Significance was established as $p \leq 0.05$ with a 95% confidence interval.

Results: Biopsies of 10 patients and a healthy control (9 female, 1 male) were analyzed. The mean age was 54.5 years (18-74 years). Four of 10 patients had diffuse, 4 had limited scleroderma, 1 had overlap syndrome, and 1 had sclerodermiform graft-versus-host disease. The mean fibroblasts count per field was 13.2 in scleroderma versus 7.2 in normal skin. The mean expression of Gal-1 in scleroderma fibroblasts was 13% (0%-56%) and 47.5% for Gal-3 (6.5%-95.5%); in normal skin, the mean expression was 91% (90%-95%) for Gal-1 and 97% (89%-100%) for Gal-3. A higher Gal-3 expression in scleroderma (within its lower expression compared with normal skin) was associated with pulmonary artery hypertension ($p = 0.004$) and to a higher modified Rodnan's skin score ($p = 0.0003$). In a similar manner, anti-centromere antibodies were associated with a higher Gal-1 expression in SSc skin fibroblasts ($p = 0.04$).

Conclusions: Gal-1 and Gal-3 had a lower expression in scleroderma lesional skin compared with a normal control. We found a significant correlation between a higher Gal-3 expression (within the lower ones compared with normal skin) in fibroblasts from SSc patients and severe disease (pulmonary hypertension and a higher modified Rodnan's skin score) compared with patients with lower expression of this protein. Similarly, the presence of anti-centromere antibodies was associat with a higher expression of Gal-1 within this group of patients.

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