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Diagnostic Potential of Tear and Serum Proteomic Patterns in Mikulicz's Disease

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BACKGROUND: Histological and functional changes in systemic diseases might be reflected in proteomic patterns in biological fluids. In this study, we carried out a determination of the disease biomarkers in tear fluid and serum for Mikulicz's Disease (MD) and a performance of noninvasive diagnostic test based on the proteomic patterns.

METHODS: A 40-year-old woman with bilateral swelling in the eyelids and submandibular region was admitted. Laboratory data showed hypergamma-globulinemia (IgG 3450mg/dl, IgG4 2400mg/dl, IgA 91mg/dl, IgM 80mg/dl), hypocomplementemia (C373mg/dl, C4 2mg/dl, CH50 < 19.0 U/ml) and renal tubular dysfunction. Gallium-67 scintigram indicated abnormal uptake in bilateral lacrimal glands, submandibular glands, and kidneys. Protein profilings in tear fluids and serum were identified by surface enhanced laser desorption/ionization time-of-flight mass spectrometry (SELDI-TOF-MS). **RESULTS:** Biopsy specimens of her lacrimal gland and minor salivary gland showed diffuse infiltration of lymphocytes and renal biopsy specimens also showed severe interstitial infiltration of lymphocytes which were positive with IgG4 staining. She was diagnosed MD with IgG4 expression. She was successfully treated by methylprednisolone pulse therapy followed by prednisolone 60 mg/day, and symptoms and laboratory data were normalized. In SELDI-TOF-MS, multiple protein changes were detected both in tear and serum in the range from 3000 to 20000m/z . Five peptide peaks were up-regulated and 4 peaks were down-regulated in tear before treatment compared with normal volunteer. Three of 5 up-regulated peaks and 2 of 4 down-regulated peaks were recovered within normal levels after steroid therapy. In serum, 5 up-regulated peaks were normalized after treatment. **CONCLUSION:** These findings support the potential of proteomic pattern technology in tear fluids and serum as the noninvasive diagnostic test for MD and/or IgG4-related disorders.

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