HPLC analysis of tear proteins in giant papillary conjunctivitis

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Abstract. Giant papillary conjunctivitis (GPC) is a well defined entity seen in patients with deposits on their lenses. High performance liquid chromatography (HPLC) tear protein analysis was performed on 17 GPC patients and compared with healthy controls with and without contact lenses. The IgA levels are somewhat lower in GPC patients as compared with healthy controls not wearing lenses (P < 0.05). A similar decrease was also seen in the control group wearing contact lenses. We were not able to identify a specific HPLC tear protein profile in GPC patients as compared with controls. The HPLC profile therefore gives no explanation for the lens deposits and is not suitable as a diagnostic or prognostic tool.

Introduction

Contact lens wear is often associated with deposit formation on lenses [8]. This can result in a large variety of complaints ranging from discomfort or red eyes up to giant papillary conjunctivitis. This pathological condition is a well defined entity seen in patients wearing contact lenses and eye prostheses. The symptoms consist of irritation, mucous discharge, blurred vision and lens intolerance. Giant papillae of the conjunctiva with polygonal structure are seen in the superior fornix. Capillaries merge to its centre, giving it a glomerulus-like appearance [1].

Allansmith et al. [1] were the first to describe this entity. Histological examination revealed basophils, eosinophils and mast cells, suggesting an immunological cause. The efferent arc of this possibly immunological reaction has already been studied by others. Donshik and Ballow [7] found elevated levels of IgE, IgG and IgM in tears of patients with GPC. Elevated
levels of the complement factors C3 and B have been described by Ballow et al. [2].

To our knowledge the afferent arc of the immunological reaction has not yet been studied. Allansmith et al. [1] had previously suggested that the lens deposits act as the antigen against which the allergic reaction is directed.

Recently Gudmundsson et al. [9] have shown that tear proteins are an important component of lens deposits. Ballow et al. [3] found that levels of the tear protein lactoferrin were reduced in patients with active GPC. Aim of our study was to find out whether there is a specific tear protein profile in patients with GPC which could explain the deposits on the lenses. The tear protein profiles were obtained by using high performance liquid chromatography, a rapid and simple method which gives a qualitative and quantitative analysis of the tear proteins sIgA, lactoferrin, lysozyme and Protein G [4, 6].

Materials and methods

Tears were collected with Schirmer strips. After total wetting or after a maximum of five minutes the strips were stored in 0.5 ml HPLC buffer [6]. The samples were then centrifuged for 10 minutes at 2000 xg and 25 µl of eluate was applied to the column. Separation was performed on a Protein Pack column I-125. The protein profile was measured with an UV spectrophotometer at 280 nm. The area under the curve was calculated by integration and the relative amounts of the proteins were given in percentages. Analysis of data was performed by a two-sided Student’s t-test. samples were obtained from 17 patients in the acute phase of GPC with the symptoms well outlined in the literature [1, 7]. Forty-two Individuals not wearing contact lenses and 9 individual wearing contact lenses served as controls. All controls had neither complaints nor symptoms. The mean age of the three groups was 34, 31 and 31 years respectively.

Results

The percentages of the tear proteins sIgA, lactoferrin, protein G and lysozyme obtained by HPLC analysis are shown in Table 1. The IgA levels are somewhat lower in GPC patients than in healthy control not wearing lenses (P < 0.05). A similar decrease was also seen in the control group wearing contact lenses. No abnormalities were seen in the other protein peaks. A representative HPLC profile obtained from a GPC patients is shown in Fig. 1. For comparison, a tear protein profile of a contact lens wearer with