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عنوان البحث:

Thyroid gland dysfunction and keratoconus

مكان وتاريخ النشر:

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Background:

The association between keratoconus and thyroid gland dysfunction (TGD) remains controversial. We aimed to determine the frequency of keratoconus among patients with laboratory-confirmed, treatment-naive TGD compared with that of age- and sex-matched healthy controls. Moreover, we investigated the potential relationship between TGD and corneal topographic and tomographic parameters.

Methods: This multicenter, cross-sectional study recruited individuals with treatment-naive, laboratory-confirmed TGD and sex- and age-matched healthy controls. Demographic and ophthalmic data of all participants were recorded. All participants underwent comprehensive ocular examinations and corneal tomography. Patterns of symmetric bowtie, asymmetric bowtie, asymmetric bowtie/superior steep, asymmetric bowtie/inferior steep, or asymmetric bowtie pattern with a skewed radial axis were documented if present. Furthermore, the maximum simulated keratometry value (Kmax), corneal thinnest thickness (CTT), and back elevation (BE) values were recorded. We measured the serum concentrations of thyroid-stimulating hormone (TSH) and thyroid hormones (free thyroxine [FT4] and free tri-iodothyronine [FT3]) using an immunoassay method.

Results: We included 200 eyes of 200 individuals with TGD and 200 eyes of 200 healthy age- and sex-matched controls, with female predominance in both groups. The mean FT4 concentration was significantly higher and the TSH concentration was significantly lower in the TGD group than in the control group (both $P < 0.0001$), whereas the FT3 level was comparable between groups ($P > 0.05$). In the TGD group, the frequencies of hyperthyroidism and hypothyroidism were 190 (95%) and 10 (5%), respectively. We found significantly lower mean CTT, higher Kmax, and greater BE values with a significantly higher frequency of abnormal topographic patterns among eyes in the TGD group than in controls (all $P < 0.05$). The frequency of eyes with keratoconus was significantly higher in the TGD (7.5%) group than in the control (0.5%) group ($P < 0.0001$). Except for a statistically significant correlation of Kmax ($r = - 0.23$, $P < 0.05$) and CTT ($r = + 0.15$, $P < 0.05$) with TSH level in the TGD group, no significant correlation was found between corneal characteristics and thyroid profile in either group (all $P > 0.05$).

Conclusions: We observed a higher frequency of keratoconus, with female predominance, in the TGD group. TGD was associated with significant changes in certain corneal topographic and tomographic parameters. Compared with healthy controls, individuals with TGD demonstrated increased Kmax and BE values with more corneal thinning, highlighting the potential association between keratoconus and TGD. However, further large-scale longitudinal studies are essential to confirm our findings.