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RETINAL MICROVASCULAR AND NEURONAL CHANGES IN ADOLESCENTS WITH TYPE 1 DIABETES

Oral

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Purpose:

Type 1 diabetes (T1D) is the most common metabolic disorder of childhood and adolescence. Early identification of retinal changes in young patients may be of clinical value for monitoring diabetic retinopathy (DR) development. The aim of this study was to investigate retinal morphology and vascularization changes in T1D adolescents

Methods:

Adolescents with childhood-onset, long lasting (> 10 years) T1D were consecutively enrolled in this cross-sectional study. A group of healthy age-matched subjects served as healthy controls (HC). Patients and controls underwent optical coherence tomography (OCT) and OCT-angiography (OCTA). The following parameters were considered: retinal thickness and volume for each macular layer, peripapillary retinal nerve fiber layer thickness (pRNFL), and vascular parameters (vessel area density (VAD), vessel length fraction (VLF) and vessel diameter index (VDI)) of macular superficial vascular (SVP), intermediate (ICP), deep (DCP) and radial peripapillary capillary plexuses (RPCP) were quantified.

Results:

Thirty-nine patients (5 with (DR group) and 34 without (noDR group) diabetic retinopathy) and 20 HC were enrolled. The pRNFL and ganglion cell layer (GCL) were thicker in noDR compared to HC and DR, reaching statistically significant values versus HC for some sectors. At the macular level, VAD and VLF were reduced in DR versus HC in all plexuses, and versus noDR in SVP ($p < 0.005$ for all). At the RPCP level, VAD and VDI were increased in noDR versus HC, significantly for VDI ($p = 0.0067$). Glycemic indices correlated to retinal parameters.

Conclusions:

Microvascular and neuronal retinal changes are present in T1D adolescents after long-lasting disease, even in the absence of clinical signs of DR. These changes modify when clinical retinopathy develops. The precocious identification of specific OCT and OCTA changes may be a hallmark of subsequent overt retinopathy.