

## **Color Doppler imaging in thyroid eye disease and correlation to disease activity**

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**Purpose:** To evaluate alterations in orbital color Doppler imaging (CDI) parameters and their relations to disease activity and severity in patients with thyroid eye disease (TED).

**Methods:** seventy-six orbits of 45 TED patients and 40 orbits of 20 normal controls were enrolled in this prospective observational study. According to clinical activity score (CAS), patients were categorized to active ( $CAS \geq 3$ ) or inactive disease ( $CAS < 3$ ). In addition, TED patients were classified as mild or moderate to severe disease. CDI parameters in the ophthalmic artery, superior ophthalmic vein, central retinal artery and vein were determined in all subjects.

**Results:** There was a significant difference in maximum velocity in superior ophthalmic vein (SOV), end diastolic velocity (EDV) and resistance index (RI) in ophthalmic artery between case and control groups. Compared to inactive disease, patients in active phase had significantly lower maximum and minimum velocity in SOV and ophthalmic artery resistance index, whereas higher end diastolic velocity (EDV) in ophthalmic artery. Disease severity didn't have an independent effect on CDI parameters. A cut-off point of 3.99 cm/s in superior ophthalmic vein maximum velocity yielded a sensitivity and specificity of 91.2% and 81.2% respectively in detecting active phase.

**Conclusion:** Retrobulbar blood flow is altered in TED and CDI parameters in SOV may be helpful in the differentiation of active and inactive phases of disease. However, clinical implication of the cut-off point to distinguish active disease mandates further investigations.