



# Evaluation of macular blood flow after intermittent intravenous infusion of high-dose corticosteroids (pulse therapy) in patients with thyroid-associated orbitopathy (TAO) using angio-OCT

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Dear Editor,

I read with great interest the article by Del Noce et al. entitled “Evaluation of macular blood flow after intermittent intravenous infusion of high-dose corticosteroids (pulse therapy) in patients with thyroid-associated orbitopathy (TAO) using angio-OCT” [1]. I would like to raise a few comments on the set of inclusion criteria.

Thyroid-associated orbitopathy is characterized by swelling of extraocular muscles, orbital tissue, and fat in inextensible rigid bony walls of the orbit which may lead to orbital compartment syndrome with impaired orbital blood circulation and even macular blood flow. The cases demonstrating moderate-to-severe thyroid-associated orbitopathy may be evaluated in detail according to their clinical features as type 1 and type 2 cases. Type 1 cases are with higher degrees of proptosis due to orbital fat volume increase, and the ability of protrusion of the globe may protect the development of orbital compartment syndrome and orbital blood flow impairment. However, type 2 orbitopathy cases are more prone to develop orbital compartment syndrome related to enlarged and restricted muscles and relatively limited protrusion of the globe. At this point, the type of orbitopathy is worth evaluating.

Hyperthyroidism may also cause an increase in heart rate, systolic blood pressure, and cardiac output which may have an impact on hemodynamic changes in many organs, including the eyes [2]. Furthermore, several medications such as systemic beta-blockers which are used in the treatment of some hyperthyroid patients may affect systemic and ocular blood circulation [3]. Therefore, the thyroid status

of patients and details of the medications might be worth considering.

Finally, smoking has various effects on retinal and choroidal blood flow that were confirmed with clinical studies [4, 5]. In this regard, the smoking habit of the patients remains a significant factor that may change macular blood flow.

## Declarations

**Conflict of interest** The author declares no competing interests.

## References

1. Del Noce C, Roda M, Ferro Desideri L et al (2022) Evaluation of macular blood flow after intermittent intravenous infusion of high-dose corticosteroids (pulse therapy) in patients with thyroid-associated orbitopathy (TAO) using angio-OCT. *Graefes Arch Clin Exp Ophthalmol* 260(2):571–576. <https://doi.org/10.1007/s00417-021-05336-4>
2. Jabbar A, Pingitore A, Pearce SH et al (2017) Thyroid hormones and cardiovascular disease. *Nat Rev Cardiol* 14(1):39–55. <https://doi.org/10.1038/nrcardio.2016.174>
3. Madej A, Gierek-Ciaciura S, Haberka M et al (2010) Effects of bisoprolol and cilazapril on the central retinal artery blood flow in patients with essential hypertension—preliminary results. *Ups J Med Sci* 115(4):249–252. <https://doi.org/10.3109/03009734.2010.487951>
4. Rose K, Flanagan JG, Patel SR et al (2014) Retinal blood flow and vascular reactivity in chronic smokers. *Invest Ophthalmol Vis Sci* 55(7):4266–4276. <https://doi.org/10.1167/iovs.14-14022>
5. Isik MU, Akay F, Akmaz B et al (2021) Evaluation of subclinical alterations in retinal layers and microvascular structures with OCT and OCTA in healthy young short-term smokers. *Photodiagnosis Photodyn Ther* 36:102482. <https://doi.org/10.1016/j.pdpdt.2021.102482>

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