Letter to the Editor

How the blooming effect can interfere on choroidal vascularity index assessments using optical coherence tomography

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Comment on: Zhou H, Lu J, Chen K, *et al.* Mitigating the effects of choroidal hyper- and hypo-transmission defects on choroidal vascularity index assessments using optical coherence tomography. Quant Imaging Med Surg 2022;12:2932-46.

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We read with great interest the article titled "Mitigating the effects of choroidal hyper- and hypo-transmission defects on choroidal vascularity index assessments using optical coherence tomography" by Zhou *et al.* (1). The authors deserve to be congratulated for their study, but we would like to add some comments.

Choroidal characteristics have been evaluated in several conditions. In this paper the authors propose a simulation model to reveal the impact of choroidal hyper/hypo-transmission defects in choroidal vascularity index (CVI) quantification (1). This index was first described by Sonoda *et al.* to try to better distinguish the luminal from the stromal area representing the ratio between vascular luminal area and total choroid (2). Since then, CVI has been largely used for such a purpose in the international literature (3). To overcome the choroidal hyper/hypo-transmission defects can improve CVI quantification, but unfortunately this is not the only problem of this kind of technique. Indeed, it can be influenced by the so-called blooming effect, as we already pointed out on another occasion (4).

Blooming effect is well known in the echographic field and consists of an artifact that makes difficult to obtain reliable measurements of the examined structures, mainly if they are very small as in case if ocular and orbital structures (5-7). This effect is related to the signal amplification and seems to be present also in case of optical coherence tomography (OCT) and CVI evaluation. In other words, high signal amplification will make the image brighter, increasing the number of white pixels on the contrary, a low setting will decrease this number (8-10). In this way, the low reflective areas will appear smaller with high settings and larger utilizing low settings. As CVI is obtained converting an image from gray scale into a binary one, which has only black and white pixels, utilizing low settings the image will appear darker and the number of white pixels will be lower compared to the same image, utilizing a higher amplification setting. Utilizing a higher amplification, the low reflective luminal area will appear decreased compared to the same image obtained with lower amplification, making the comparison between pictures and the results unreliable. To avoid such a problem and to get reliable results, a standardization of the method, to the best of our knowledge, so far unavailable, should be needed.

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Footnote

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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