

## Smokers' Choroidal Changes

We read with great interest the article by Wei et al.<sup>1</sup> concerning "Choroidal Structural Changes in Smokers Measured Using Choroidal Vascularity Index."

We congratulate the authors for their very interesting study, but we would like to make some comments.

We are a bit concerned on the patients' recruitment methods.

The authors compared smokers to nonsmoker patients, but it seems that the two groups were not correctly matched. In fact, not only was the non-smokers group younger than the smokers group, but the groups were not matched by axial length or at least refraction. This could have heavily influenced the results, as it is well known that patients with longer eyes have thinner choroids.

Moreover, the authors utilized the choroidal vascularity index (CVI), a parameter obtained converting a gray-scaled image into a new one, defined as "binary image," allowing pixels to assume only two possible values, that is to say black or white, instead of a plethora of measures associated with different gray shades.

Even if CVI has been largely used in the international literature, in our opinion, it has an important limitation: it can be influenced by the so-called "blooming effect."<sup>2,3</sup> This is an artifact well known in the ultrasonography field<sup>4,5</sup> that makes it difficult to obtain reliable measurements, mainly if they are very small, as in the case of the ocular and orbital ones.<sup>6,7</sup> This effect is related to the signal amplification (i.e. when high signal amplification is used, the image will appear brighter and the number of white pixels will be greater); indeed, the exact opposite phenomenon will happen when using low signal amplification.<sup>8,9</sup>

This artifact seems to be present also in case of optical coherence tomography (OCT): this is why we are afraid that this effect could also influence the binarization utilized in the CVI evaluation, increasing the low reflective areas (considered to be associated with luminal ones) when the amplification is low, whereas reducing them when the amplification is higher.

For all these reasons, in our opinion, the flaws presented in this study cannot allow a definitive and reliable conclusion.

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Citation: *Invest Ophthalmol Vis Sci*. 2022;63(5):21.  
<https://doi.org/10.1167/iovs.63.5.21>

