

CORRESPONDENCE

Open Access



# Comments on “Effects of refractive accommodation on subfoveal choroidal thickness in silicone oil-filled eyes” *BMC Ophthalmology* (2022) 22:107 <https://doi.org/10.1186/s12886-022-02332-y>

Lei Gao<sup>1,2\*</sup> , Yang Zhou<sup>2</sup> and Guangsen Liu<sup>1</sup>

**Keywords:** Accommodation, Silicone oil, Ocular parameters, Choroidal thickness

Dear Editor:

When we searched the literature on accommodation, we occasionally found an article entitled “Effects of refractive accommodation on subfoveal choroidal thickness in silicone oil-filled eyes” published in *BMC Ophthalmology* (2022) 22:107, which aroused our curiosity as doctors engaged in vitreoretinal specialties.

As we all know, the influence of accommodation on eye parameters is still worth further exploring, such as anterior chamber depth, vitreous cavity length and axial length may change when accommodation was initiated [1]. However, it is difficult to imagine that accommodation can affect choroidal thickness in silicone oil-filled eyes within 24 h, according to the existing Helmholtz theory of accommodation [2, 3].

If accommodation can affect choroidal thickness in silicone oil-filled eyes, that is, even in non-silicone oil-filled eyes, accommodation can theoretically affect the

choroidal thickness. This is because accommodation can occur anytime and anywhere, regardless of whether silicone oil is used. Silicone oil, as a tamponade, is colorless, tasteless, non-toxic, and non-flexible.

In this study, the effect of accommodation on choroidal thickness in silicone oil-filled eyes was determined indirectly. A more scientific conclusion should be the short-term effect of the hyperopia contact lens on choroidal thickness in silicone oil-filled eyes. The possible changes that occur after wearing a hyperopic contact lens should be analyzed. However, based on our current knowledge of the Helmholtz theory of accommodation, it is difficult to imagine that wearing contact lenses to correct hyperopia has a significant effect on choroidal thickness.

We fully agree with the authors’ view that the choroidal thickness was quite different for hyperopic and myopic patients. However, the difference in choroidal thickness is due to long-term effects of the refractive state. Another important fact is that, regardless of myopia or hyperopia, the most significant difference between the two refractive states is the difference in the axis length, and the axis length of the eye is undoubtedly more likely to lead to changes in choroidal thickness [4, 5].

There are still some problems in this study: 1) The average age of the study was 38 years old, and the amplitude of accommodation was only about 4.5D, which is

This comment refers to the article available at <https://doi.org/10.1186/s12886-022-02332-y>.

\*Correspondence: [gl6365@163.com](mailto:gl6365@163.com)

<sup>1</sup>Department of Ophthalmology, Weifang Eye Hospital, Zhengda Guangming Eye Group, 139 Xingfujie, Weifang 261000, Shandong, China  
Full list of author information is available at the end of the article



© The Author(s) 2022. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article’s Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article’s Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

much lower than the 14D of 10-year-old children, so it is doubtful that such an amplitude of accommodation can produce a significant effect on choroidal thickness within 24h. If the effect of accommodation on choroidal thickness is to be studied, a population of children who are eligible for OCT should be the first choice, as their amplitude of accommodation is much greater than that of adult; 2) the refractive state of the contralateral eye and the best-corrected visual acuity were not provided. According to the theory of accommodation, the accommodation used by both eyes is symmetrical and equal and often takes the dominant eye as the reference [1]. Considering that the control group was a healthy eye, and the experimental group was patients only 1 month after the operation, the patient took the healthy eye as the dominant eye. In other words, even if the surgical eye wears a hyperopic contact lens, the accommodation induced by the contact lenses may also be negligible. 3) According to the existing accommodation theory, the realization of accommodation mainly depends on the change in lens refractive power, and the change in lens refractive power in a short time is mainly reflected in the changes in lens configuration or more directly and easily observed changes in lens thickness. However, this study obviously does not provide the difference in lens thickness before and after wearing contact lenses.

In summary, although there are no obvious flaws in the study design, according to the existing and recognized ophthalmic knowledge system, it is inconceivable that a contact lens can significantly affect the choroidal thickness of silicone oil-filled eyes within 24h unless there are other theoretical breakthroughs. We recommend that in addition to increasing the sample size, automatic data acquisition be used as much as possible to minimize the bias caused by manual measurement.

#### Acknowledgements

Not applicable.

#### Authors' contributions

ZY and LG contributed significantly to analysis and manuscript preparation; GL was involved in the design and conception of this manuscript and revised the manuscript. The authors read and approved the final manuscript.

#### Funding

None.

#### Availability of data and materials

Not applicable.

#### Declarations

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

#### Author details

<sup>1</sup>Department of Ophthalmology, Weifang Eye Hospital, Zhengda Guangming Eye Group, 139 Xingfujie, Weifang 261000, Shandong, China. <sup>2</sup>Zhengda Guangming International Eye Reserch Center, Qingdao University, Qingdao, China.

Received: 17 March 2022 Accepted: 20 November 2022

Published online: 08 December 2022

#### References

- Gao L, Zhuo X, Kwok AK, Yu N, Ma L, Wang J. The change in ocular refractive components after cycloplegia in children. *Jpn J Ophthalmol.* 2002;46(3):293–8.
- Glasser A, Kaufman PL. The mechanism of accommodation in primates. *Ophthalmology.* 1999;106(5):863–72.
- Strenk SA, Semmlow JL, Strenk LM, Munoz P, Gronlund-Jacob J, DeMarco JK. Age-related changes in human ciliary muscle and lens: a magnetic resonance imaging study. *Invest Ophthalmol Vis Sci.* 1999;40(6):1162–9.
- Prousalis E, Dastiridou A, Ziakas N, Androudi S, Mataftsi A. Choroidal thickness and ocular growth in childhood. *Surv Ophthalmol.* 2021;66(2):261–75.
- Jonas JB, Wang YX, Dong L, Guo Y, Panda-Jonas S. Advances in myopia research anatomical findings in highly myopic eyes. *Eye Vis.* 2020;2(7):45.

#### Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more [biomedcentral.com/submissions](https://biomedcentral.com/submissions)

