中山大學 中山眼科中心 ZHONGSHAN OPHTHALMIC CENTER, SUN YAT-SEN UNIVERSITY

Contents lists available at Lighthouse Scholar

EYE SCIENCE

journal homepage: journal.gzzoc. com

doi: 10.12419/es24111002
View this article at: https://dx.doi.org/10.12419/es24111002

· Commentary ·

Reconsidering the necessity of congenital cataract classification

Yizhi Liu (刘奕志)

State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangdong Provincial Key Laboratory of Ophthalmology and Visual Science, Guangdong Provincial Clinical Research Center for Ocular Diseases, Guangzhou, 510060, China

Commentary on:
Tan Y, Li YQ, Chen H, Liu ZZ. Classiffcation of congenital cataracts and prospects for treatment and diagnosis. Eye Science, 2024, 1(4): 393-398. doi: 10.12419/es24081301

Cite this article as: Liu YZ. Reconsidering the necessity of congenital cataract classification. Eye Science, 2024, 1(4): 399-400. doi: 10.12419/es24111002.

An effective congenital cataract classification system for clinical use should facilitate both precise diagnosis and provide clear, actionable guidance for treatment decisions. While existing classification systems have been instrumental over time, they are increasingly limited by advancements in medical technology and a more nuanced understanding of cataracts.[1] Challenges such as overly complex frameworks, inconsistent standards, and insufficient alignment with contemporary clinical demands have become apparent. Additionally, the advent of innovative screening tools, including the integration of smartphone-based systems combined with AI algorithms, as well as non-contact portable devices, has significantly advanced congenital cataract screening.[2] These developments highlight the pressing need for a more streamlined and practical classification system.

Tan et al. have re-evaluated various previously reported congenital cataract classification systems, summarizing the strengths and weaknesses of recent developments.[3] Their review highlights the limitations of current systems.

However, the classifications listed by Tan et al. still fall short in practical improvements,[3] failing to fully meet clinical needs. For example, phenotype-based classifications can differentiate types of congenital cataracts by ocular or systemic anomalies but often do not capture all anomalies in affected children.[4] On the other hand, gene-based classifications, while aiding in molecular diagnosis and providing genetic counseling to families, are still limited in clinical application.[5]

Therefore, to advance the development of the congenital cataract classification system, in-depth research and improvements are needed in the following areas:

Received date: 2024-11-16; **Revised date:** 202-11-25; **Accepted date:** 2024-12-12; **Published online:** 2024-12-20

Corresponding author: Yizhi Liu, E-mail: liuyizhi@gzzoc.com.

Full Text

1. Timing of detection: The progression of cataracts is dynamic, and the timing of detection (e.g., during embryogenesis, at birth, or later stages) directly affects prognosis. A new classification system should clearly reflect this timing to better guide clinical decisions.

2. Integration of structural and functional assessment: Beyond merely evaluating the morphology of lens opacities, the specific impact of cataracts on visual function should be considered. Function-oriented assessments can provide more precise guidance for treatment plans, thereby optimizing visual outcomes for patients.

3. Incorporation of psychosocial factors: An effective classification system should address the psychosocial impact of the disease on patients and their families, including treatment preparation, low-vision rehabilitation, and emotional burden. For instance, unilateral versus bilateral cataracts present significant developmental and psychosocial differences, warranting personalized treatment strategies to meet diverse patient needs.

4. Introduction of precision medicine concepts: Advances in modern molecular genetics technologies (like whole exome sequencing and nanopore genome sequencing) have proven to significantly increase diagnostic rates and uncover more unknown genetic anomalies. As sequencing costs decrease, these technologies will become more widespread, offering crucial tools for genetic counseling.

In conclusion, traditional congenital cataract classification systems are no longer adequate for the complex demands of contemporary clinical practice. Future classification methods should focus on the timing of assessment, combine structural and functional analysis, and consider psychosocial factors. By redefining classification standards closely related to clinical decision-making, we can better meet the multifaceted needs of children and their families, thereby enhancing the quality of eye health services and improving patients' quality of life.

Correction notice
None

Acknowledgement
None

Author Contributions
(I) Conception and design: Yizhi Liu
(II) Administrative support: None
(III) Provision of study materials or patients: None
(IV) Collection and assembly of data: None
(V) Data analysis and interpretation: None
(VI) Manuscript writing: Yizhi Liu
(VII) Final approval of manuscript: Yizhi Liu

Funding
None

Conflict of Interests
None of the author has any conflicts of interest to disclose. The author has declared in the completed the ICMJE uniform disclosure form.

Patient consent for publication
None

Ethical Statement
None

Provenance and Peer Review
This article was a standard submission to our journal. The article has undergone peer review with our anonymous review system.

Data Sharing Statement
None

References

1. Zou Y, Li Y, Liu Z. The statusquo and advances in categorization of congenital cataract. Eye Science. 2024; 1: 55-66
2. https://journal.gzzoc.com/Ykxb/Journal/ArticleShow.aspx?AID=1141
3. Tan Y, Zou YS, Yu YL, Hu LY, Zhang T, Chen H, Jin L, Lin DR, Liu YZ, Lin HT, Liu ZZ. Classification of congenital cataracts based on multidimensional phenotypes and its association with visual outcomes. Int J Ophthalmol. 2024;17:473-479
4. Lenhart PD, Lambert SR. Current management of infantile cataracts. Surv Ophthalmol. 2022; 67: 1476-1505
5. Messina-Baas O, Cuevas-Covarrubias SA. Inherited Congenital Cataract: A Guide to Suspect the Genetic Etiology in the Cataract Genesis. Mol Syndromol. 2017; 8: 58-78