

# High-grade myopia and vaginal delivery: A narrative review

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## ABSTRACT

This narrative review explores the risks and management considerations of vaginal delivery in individuals with high-grade myopia, a condition associated with potential complications like retinal detachment and choroidal neovascularization. Utilizing 24 references, the review follows a modified rapid literature review model as outlined by Tjoa and Sutanto (2024). Eleven core studies out of an initial 234, including case reports and retrospective studies, were analyzed in the final qualitative assessment. The findings suggest that high-grade myopia, by itself, generally does not require cesarean section (C-section), and vaginal delivery is considered safe for most patients, provided there is regular ophthalmological monitoring throughout pregnancy. There is no strong evidence supporting a universal recommendation for C-section solely due to high myopia, except in the presence of severe complications, such as choroidal neovascularization. The review emphasizes individualized care, with delivery mode decisions tailored to each patient's specific ocular risk factors. Routine C-sections without additional complicating factors are not justified, underscoring the need for regular ophthalmological evaluations to ensure optimal maternal and fetal outcomes. Due to the limitations of existing studies, further in-depth research is recommended to confirm these findings and refine clinical guidelines.

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## INTRODUCTION

High-grade myopia, a condition characterized by severe nearsightedness with refractive errors of more than -6.00 diopters, presents unique challenges during pregnancy and childbirth (Dinniyaputeri et al., 2019). As a structural abnormality of the eye, myopia is associated with an increased risk of retinal complications, such as retinal detachment and macular degeneration. During normal labor, especially in cases involving significant physical stress during the labor process, this risk may increase due to the potential for increased intraocular pressure (Jufan et al., 2017). This raises concerns about whether women with high-grade myopia should have a normal labor or consider alternative methods such as cesarean section to minimize the risk of eye

complications. With the increasing prevalence of myopia globally and the growing concern for maternal health, understanding the implications of normal childbirth in women with high-grade myopia is becoming increasingly important (Anandita et al., 2023).

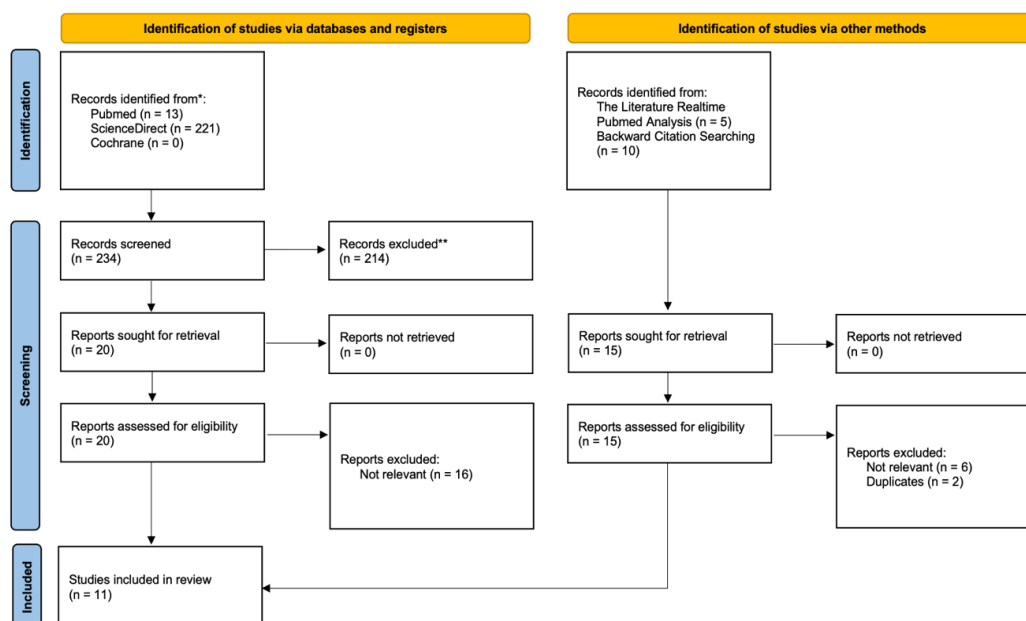
The World Health Organization (WHO) highlights that the global rate of caesarean sections is rising, currently accounting for over 1 in 5 (21%) of all births. This number is projected to increase, with nearly a third (29%) of all births expected to be by caesarean section by 2030. However, disparities on accessibility of caesarean sections for women, especially in low to middle income countries, raises questions on medical and non-medical indications that supports the rise of caesarean section as mode of delivery (Who.int, 2021).

While caesarean sections can be critical and lifesaving, performing them without medical necessity can expose women and babies to unnecessary short- and long-term health risks (Iskandar et al., 2020). Studies indicate that eye diseases are among the primary non-midwifery reasons for performing C-section deliveries. The number of nearsighted women in labor seeking eye consultations has risen over time (Sapuła-Grabowska et al., 2019a). However, in a study conducted by Liu S et al. (2010) on 4897 deliveries reported that myopia (especially high grade myopia) is the most frequent eye disease associated with C-section delivery (Liu et al., 2002). High grade myopia was the leading ocular reason for cesarean section, accounting for 57% of women in labor in cases analyzed from 2000 to 2008 (Socha et al., 2010). Invertedly, it was reported in a cohort study conducted by (Fernández-Montero et al., 2017) that there is no association between pregnancy and myopia progression.

High grade myopia is characterized by severe nearsightedness and structural changes in the eye, such as posterior staphyloma, choroidal neovascularization, and retinal detachment (Supit, 2021). These complications can lead to significant visual impairment and require careful management, especially during pregnancy and childbirth (Williams & Hammond, 2019). Therefore, concerns about potential retinal complications during vaginal delivery prompt discussions about the necessity of cesarean sections.

## RESEARCH METHOD

This narrative review explores the current body of literature regarding the risks and management considerations of vaginal delivery in individuals diagnosed with high-risk myopia. We followed a novel modified Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) model for rapid literature review described by Tjoa (2024) and Sutanto et al. (2024) to create a robust rapid analysis with the help of the Literature Realtime Pubmed Analysis software (Oates, 2024). Three independent researchers assess the quality of the studies in a qualitative manner as outlined by the flowchart in Figure 1.



**Figure 1.** Literature searching process using the Tjoa (2024) and Sutanto et al. (2024) modified PRISMA method

A total of eleven studies were identified for review through a comprehensive literature search across multiple databases (Pubmed, ScienceDirect, Cochrane) using the keywords “Myopia” and “Vaginal Delivery” with their respective synonyms. After applying inclusion and exclusion criteria, these studies were deemed relevant for detailed analysis. These studies comprised a mix of research designs, including case reports, retrospective cohort studies, and clinical reviews. The evidence levels of these studies range from Level IV (case reports) to Level III (retrospective cohort studies), highlighting the need for more robust research in this area. In our analysis, no randomized or quasi-experimental clinical trials were found to answer our question.

The studies included patients with high-grade myopia, with refractive errors ranging from -6.00 to -10.00 diopters. Retrospective cohort studies had sample sizes of 50 to 200 participants, while case reports provided detailed clinical outcomes for one or two individuals. The publication years spanned from 1995 to 2021, reflecting advancements in diagnostic tools like OCT.

Retrospective studies reviewed medical records to gather data on ocular and obstetric outcomes, including complications like retinal detachment. Case reports involved clinical assessments using tools like fundoscopy and OCT to monitor ocular health before and after delivery. Statistical analyses in retrospective studies included chi-square tests and logistic regression to identify risk factors, while case reports relied on qualitative narrative analysis to identify patterns in individual outcomes. Clinical reviews synthesized existing knowledge and emphasized individualized risk assessments for managing high-grade myopia during pregnancy.

## RESULTS AND DISCUSSIONS

The relationship between high-risk myopia and vaginal delivery has been investigated by several studies with varying conclusions. A cross-sectional study with a total of 356 obstetrician and ophthalmologists reported that for healthy pregnant women who have had a previously treated retinal hole or tear due to high grade myopia or have undergone treatment for rhegmatogenous retinal detachment (RRD), a notably higher number of obstetricians recommended cesarean sections, while a significantly larger proportion of ophthalmologists favored spontaneous vaginal delivery (Chiu et al., 2015). Among obstetricians, factors such as years of experience and the type

of practice setting played a significant role in influencing their delivery recommendations. This result aligns with a 2019 retrospective cohort conducted reported an upward trend on the percentage of myopic women in labor who underwent ophthalmological consultations (Sapula-Grabowska et al., 2019b). Moreover, a Polish study also reported that out of the 53 patients who underwent cesarean sections for ophthalmologic reasons, 32 (60.4%) had high grade myopia (Socha et al., 2010). A study in Croatia also reported a significant higher rate of cesarean sections in myopic pregnant women between 1993 and 2002 when compared to non-myopic women (Loncarek et al., 2004). A qualitative survey directed to obstetricians reported that out of one hundred obstetricians, the majority (76%) recommended assisted delivery, either through cesarean section or instrumental methods, while the remaining 24% supported a normal delivery. The respondents' generational differences did not influence their recommendations. Most respondents (58%) based their decision to adjust labor management on their personal interpretation of the standard of care (Papamichael et al., 2011).

One of the earliest original research studies in this field was conducted by Neri A et al. in 1985. Their study compared fundus examinations in 50 myopic pregnant women before and after vaginal delivery. The study reported various forms of retinal degeneration and retinal tears were noted in the majority of patients upon their initial assessment, but no worsening of these retinal conditions was observed during follow-up examinations (Neri et al., 1985).

Karska-Basta et al. (2016) critically reviewed the indications for C-section in patients with high myopia and other ocular conditions. They found no substantial evidence supporting an increased risk of retinal detachment during vaginal delivery for patients with high myopia or a history of retinal surgery. Only choroidal neovascularization was identified as a condition that might warrant a C-section due to the risk of subretinal bleeding and acute visual loss during labor. This study emphasizes the need for individualized assessment rather than generalized recommendations for surgical delivery based on ocular history alone (Karska-Basta et al., 2016).

Moneta-Wielgos et al. (2019) conducted a prospective study involving 69 pregnant women with degenerative retinal lesions to evaluate ophthalmological complications during vaginal delivery. They reported that while 11% were assessed as high-risk, the majority (54%) were medium-risk, and 35% were low-risk. No postpartum complications attributable to the mode of delivery were observed over a two-year follow-up period. This study suggests that with appropriate ophthalmological assessment, many women with high-risk myopia can safely undergo vaginal delivery (Moneta-Wielgos et al., 2019).

Landau et al. (1995) performed a retrospective study on 10 women with histories of retinal detachment or lattice degeneration who had undergone a total of 19 deliveries. Their results showed no changes in retinal status postpartum, indicating that spontaneous vaginal delivery is generally safe for women with high-risk retinal pathology if they are asymptomatic at baseline (Landau et al., 1995).

Hart et al. (2007) reviewed cases involving severe myopia or other pre-existing eye diseases. They concluded that regular eye examinations each trimester are sufficient to monitor any changes in retinal status. Eye disease alone should not be an indication for instrumental or operative deliveries unless specific complications arise, further supporting the possibility of safe vaginal delivery for women with high-risk myopia (Hart et al., 2007).

Bitton et al. (2021) presented a case report of immediate postpartum macular subretinal bleeding in a highly myopic patient following vaginal delivery. This rare occurrence highlighted the potential risks associated with Valsalva maneuvers during labor but does not necessarily contraindicate vaginal delivery universally. The report, being a case report, also warrants further investigation due to its inherent bias as a non-analytical paper (Bitton et al., 2021).

Based on our findings, we recommend that decisions regarding the mode of delivery for women with high-grade myopia should be individualized rather than generalized. These studies collectively suggest that while there are certain conditions like choroidal neovascularization where

a C-section might be warranted due to specific risks, most cases of high-risk myopia do not necessitate surgical intervention solely based on ocular concerns. Regular ophthalmological assessments throughout pregnancy can help identify those at genuine risk who might benefit from alternative delivery methods. Future research, including prospective cohort studies and randomized controlled trials, is crucial to provide stronger evidence on the management of high-grade myopia during pregnancy, ultimately guiding clinical practices toward ensuring safe and effective delivery outcomes for both mother and child.

The present narrative review comprehensively examines the available literature on the risks and management considerations for vaginal delivery in individuals with high-grade myopia, providing a multidisciplinary perspective by integrating evidence from both obstetric and ophthalmological fields. The use of a modified PRISMA approach for rapid literature review allowed for a structured and transparent process in study selection and data synthesis. However, our review has some limitations that must be acknowledged. First, the evidence reviewed largely consists of case reports and retrospective studies, which may introduce bias and limit the robustness of the conclusions. Moreover, the heterogeneity in study populations, research methodologies, and outcome measures poses challenges in ensuring consistent and generalizable findings. The lack of randomized controlled trials in this area highlights the need for further research to confirm our conclusions and establish more definitive clinical guidelines.

## CONCLUSION

The current literature indicates that routine cesarean sections are not justified solely based on high-risk myopia or related ocular conditions without specific complicating factors such as choroidal neovascularization. Individualized care, supported by comprehensive ophthalmological evaluations throughout pregnancy, is essential for ensuring optimal outcomes, and the decision regarding the mode of delivery should be guided by each patient's specific ocular risk profile rather than general assumptions about the risks associated with vaginal delivery in cases of high-grade myopia. This review is limited by the reliance on lower levels of evidence, such as case reports and retrospective studies, which may affect the robustness of the findings. Future research should include prospective cohort studies or randomized controlled trials to provide stronger evidence that can guide clinical decision-making.

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