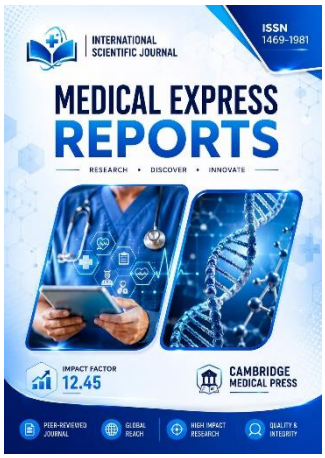
MEDICAL EXPRESS REPORTS
IMPACT FACTOR:12.45 ISSN:1469-1981



HIGH MYOPIA IN PREGNANCY: AN ALGORITHM FOR RISK STRATIFICATION OF RETINAL COMPLICATIONS AND SELECTION OF DELIVERY MANAGEMENT

Mirzajonova Nodira Ayubjon qizi
Tashkent International University of Kimyo, Namangan Branch (KIUT), Faculty of General Medicine, 3rd-year student,
+998500355606 / nodirabegimayubjanovna@gmail.com
Scientific supervisor: **Kamalova Gulnora Gulyamovna**
PhD, Acting Assoc. Prof., Tashkent International University of Kimyo, Namangan Branch Namangan, Uzbekistan

ARTICLE INFO:

Received:29.10.2026
Revised: 30.10.2026
Accepted:31.10.2026

KEY WORDS:

High myopia, pregnancy, retinal complications, rhegmatogenous retinal detachment, peripheral retinal degeneration, retinal breaks, myopic maculopathy, choroidal neovascularization, vaginal delivery, cesarean section, ophthalmological assessment, risk stratification, maternal health, multidisciplinary management.

ABSTRACT

High myopia in pregnancy represents a clinically relevant condition because of its association with axial elongation of the eyeball, peripheral retinal degeneration, myopic maculopathy, and an increased lifetime risk of retinal detachment. The management of pregnant women with high myopia remains an important interdisciplinary issue involving ophthalmology and obstetrics. Historically, high refractive error has frequently been considered a reason to recommend cesarean delivery because of concerns that the physical effort associated with the second stage of labor might precipitate retinal complications. However, the available clinical evidence does not support the routine selection of operative delivery solely on the basis of refractive error. An individualized approach that considers retinal anatomy, the presence of active pathology, previous ophthalmological interventions, and independent obstetric indications is therefore essential. The aim of this article is to analyze published evidence concerning retinal complications in pregnant women with high myopia and to propose an algorithm for ophthalmological risk stratification and selection of delivery management. A narrative review of relevant ophthalmological and obstetric literature was undertaken, focusing on pregnancy-associated ocular

changes, peripheral retinal degeneration, retinal breaks, rhegmatogenous retinal detachment, myopic macular pathology, and reported outcomes following vaginal delivery. The proposed algorithm integrates clinical history, assessment of visual symptoms, dilated fundus examination, selective retinal imaging, identification of active pathology, and multidisciplinary decision-making. The literature indicates that refractive error alone is insufficient to determine the risk of retinal complications during childbirth. Observational studies involving women with high myopia and selected pre-existing retinal abnormalities have not demonstrated consistent postpartum deterioration attributable to spontaneous vaginal delivery. Nevertheless, the available evidence is limited by small study populations, heterogeneous examination protocols, and a lack of large prospective investigations. The proposed approach distinguishes women with uncomplicated high myopia from those with peripheral retinal abnormalities requiring individualized assessment and those with active sight-threatening pathology requiring urgent specialist management. It is concluded that delivery planning should be based primarily on the anatomical and functional condition of the retina rather than the degree of myopia alone. Vaginal delivery remains an appropriate option for most women without active ophthalmological pathology or independent obstetric contraindications. Cesarean delivery should be considered when a specific clinical indication is established through individualized assessment. Prospective multicenter studies are needed to validate the proposed algorithm and determine its effectiveness in improving maternal visual outcomes.

Introduction: High myopia is a refractive condition commonly defined as a spherical equivalent of −6.00 diopters or more myopic, although axial length and structural abnormalities are also important for its clinical classification. In addition to reduced distance vision, pathological myopia may be associated with progressive elongation of the globe, chorioretinal atrophy, posterior staphyloma, peripheral retinal degeneration, and myopic macular

complications. These changes are clinically significant because certain structural abnormalities increase susceptibility to retinal tears and rhegmatogenous retinal detachment [1, 2].

Pregnancy introduces physiological changes that may affect the visual system. Hormonal fluctuations, alterations in fluid balance, changes in corneal characteristics, and variations in intraocular pressure have been described during gestation. Some women experience temporary changes in refraction or visual comfort, whereas others have pre-existing ocular diseases that require continued monitoring. It is therefore important to distinguish physiological changes associated with pregnancy from progressive retinal or macular pathology [3, 4].

The management of high myopia during pregnancy has traditionally been complicated by concerns about the potential effects of maternal expulsive efforts during vaginal delivery. In some clinical settings, women with substantial myopic refractive errors have been advised to undergo cesarean delivery or instrumental vaginal delivery to reduce the duration of the second stage of labor. However, such recommendations have not always been supported by evidence demonstrating a direct causal relationship between physiological labor and retinal detachment.

Clinical observations published over several decades indicate that women with high myopia can often deliver vaginally without measurable deterioration in retinal status. Nevertheless, these findings should not be interpreted as eliminating the need for ophthalmological assessment, particularly in patients with active retinal disease, new visual symptoms, or a history of retinal surgery [5, 6].

The central clinical problem is the distinction between the presence of high myopia and the presence of retinal pathology that may require treatment or influence delivery planning. A refractive measurement alone cannot establish whether a retinal lesion is present, whether it is active, or whether it poses an immediate threat to vision.

The purpose of this article is to develop an evidence-informed clinical algorithm for assessing retinal complications in pregnant women with high myopia and supporting individualized selection of the mode of delivery. The proposed approach emphasizes timely ophthalmological evaluation, anatomically based risk assessment, and collaboration between ophthalmologists and obstetricians.

Literature review: The association between high myopia and retinal complications is primarily related to the structural effects of axial elongation. Progressive stretching of ocular tissues may contribute to retinal thinning, alterations in the vitreoretinal interface, lattice degeneration, retinal holes, and other abnormalities. However, the presence of these changes varies substantially between individuals, and refractive severity alone does not accurately characterize every patient's retinal condition [1, 2]. Flitcroft and colleagues proposed standardized definitions and classifications of myopia to improve the consistency of clinical and epidemiological research. Their work emphasized the importance of distinguishing refractive myopia from structural complications and provided a framework for more precise clinical characterization [1]. This distinction is particularly relevant during pregnancy because the risk

associated with an individual retinal lesion cannot be inferred solely from the number of diopters. Pregnancy-related ocular changes have also been described in ophthalmological reviews. Garg and colleagues examined physiological and pathological ocular changes during pregnancy, emphasizing that certain visual symptoms may reflect transient physiological alterations, whereas other findings require specific diagnostic investigation [3]. Rzeszotarska and colleagues similarly reviewed ophthalmological problems encountered during pregnancy and discussed the importance of differentiating physiological changes from potentially sight-threatening disorders [4]. The relationship between delivery mode and retinal complications has been investigated in several observational studies. Neri and colleagues examined 50 women with myopia ranging from −4.5 to −15.0 diopters. Fundus examinations performed before and after delivery revealed no deterioration in the observed retinal abnormalities. The authors concluded that spontaneous vaginal delivery could be considered in women with high myopia [5]. Although this study remains an important contribution to the literature, its relatively small sample size limits the precision with which uncommon complications can be assessed. Landau and colleagues evaluated 10 women who experienced 19 deliveries and had a history of retinal detachment, extensive lattice degeneration, or treated symptomatic retinal breaks. No deterioration in retinal status was observed during postpartum examination. The authors concluded that spontaneous vaginal delivery could be permitted in selected women with predisposing retinal abnormalities [6]. These findings challenge the assumption that the presence of retinal risk factors automatically necessitates cesarean delivery, although larger studies are required to confirm the generalizability of the results. Changes in clinical practice have also been investigated through comparisons of delivery management across different periods. The study entitled Delivery in Myopic Women: A Comparison of Mode of Delivery in Years 1990, 2000, and 2010 described the historical influence of myopia on obstetric decisions and highlighted the role of ophthalmological referral in determining delivery recommendations [7]. Its findings illustrate the importance of basing recommendations on documented retinal abnormalities rather than refractive error alone. More recent literature reviews have continued to examine this issue. Sumual and colleagues reviewed evidence concerning high-grade myopia and vaginal delivery and concluded that high myopia alone does not establish a general contraindication to vaginal birth [8]. Their analysis also illustrates the limitations of the existing evidence, particularly the lack of large prospective studies with standardized ophthalmological assessments. The review by Zakirkhodjaev and Shavkatkhodjaev provides a regional contribution to the discussion of refractive changes during pregnancy and after childbirth. The authors describe the limited evidence concerning the effects of labor on visual outcomes and discuss changes in ocular physiology during pregnancy [9]. This publication is relevant to the development of locally applicable clinical approaches, although its conclusions must be interpreted in the context of its study design. Further information on the structural complications of high myopia is provided by Du and colleagues, who reviewed clinical manifestations and

underlying mechanisms of high-myopia complications [10]. Their work reinforces the need to evaluate pathological changes of the retina and choroid separately from refractive error. Overall, the reviewed literature supports an individualized approach to pregnancy management in women with high myopia. The available evidence does not establish uncomplicated high myopia as an independent indication for cesarean delivery. However, active retinal disease, progressive macular pathology, and new symptoms require appropriate specialist evaluation. A structured algorithm may help translate these principles into consistent clinical practice.

Materials and methods: This article was prepared as a narrative literature review and a proposed clinical decision-making algorithm. The objective was to synthesize published evidence concerning high myopia in pregnancy, retinal complications, and the selection of delivery management. Relevant literature was identified through searches of biomedical databases and academic publications, including PubMed, PubMed Central, and accessible ophthalmological and obstetric journals. The search concepts included high myopia during pregnancy, retinal detachment, retinal breaks, peripheral retinal degeneration, myopic maculopathy, ocular changes during pregnancy, vaginal delivery, cesarean section, and ophthalmological management. Publications were considered relevant when they addressed at least one of the following topics: the structural complications of high myopia; physiological or pathological ocular changes during pregnancy; retinal outcomes following vaginal delivery; delivery management in women with pre-existing retinal abnormalities; or clinical recommendations for ophthalmological assessment during pregnancy. The evidence was reviewed qualitatively. Particular attention was paid to study design, population characteristics, ophthalmological findings, delivery outcomes, and limitations affecting the interpretation of the results. Because this was a narrative review, no formal meta-analysis or pooled effect estimate was calculated. The proposed algorithm was developed by integrating the main clinical variables identified in the literature: refractive status, ocular symptoms, retinal examination findings, previous retinal interventions, the presence of active pathology, and independent obstetric indications. The resulting framework is intended to support clinical assessment and multidisciplinary communication. No original patient cohort, prospective clinical investigation, or unpublished dataset was used. Accordingly, the results represent a synthesis of published evidence and a proposed clinical framework rather than new empirical findings. The algorithm has not been prospectively validated and should not be interpreted as a numerical prediction model. The main methodological limitations include the small sample sizes of several relevant observational studies, differences in examination protocols, the limited availability of prospective data, and the lack of standardized criteria for quantifying delivery-associated retinal risk.

Results: The literature review identified several consistent findings relevant to the assessment of pregnant women with high myopia. First, high myopia is associated with an increased background risk of retinal and chorioretinal abnormalities, but the severity of

refractive error does not independently establish the presence or activity of a retinal lesion. Second, available observational studies have not demonstrated a consistent association between spontaneous vaginal delivery and deterioration in retinal status among the selected women examined. Third, the clinical significance of an ocular abnormality depends on its anatomical characteristics, activity, symptoms, and treatment history. Based on these findings, a proposed algorithm for risk stratification and delivery management was developed.

Stage 1. Initial identification and history-taking. At the first antenatal assessment, the clinician should document the history of high myopia, previous retinal tears or detachment, retinal laser treatment, vitreoretinal surgery, and current visual symptoms. New flashes of light, a sudden increase in floaters, a curtain-like shadow, or abrupt visual deterioration should prompt urgent ophthalmological assessment. Such symptoms require evaluation regardless of the patient's refractive error or gestational age.

Stage 2. Ophthalmological examination. The assessment should include visual acuity, relevant ocular history, and a dilated fundus examination with careful evaluation of the peripheral retina when clinically feasible. Optical coherence tomography may be indicated when macular pathology or myopic choroidal neovascularization is suspected. Additional imaging should be selected according to the clinical findings. The examination should distinguish uncomplicated high myopia from peripheral retinal degeneration, retinal breaks, established retinal detachment, and active macular disease. Stage 3. Clinical risk classification. For practical purposes, the proposed framework separates patients into three descriptive categories.

The first category, lower ophthalmological concern, includes women with high myopia but no active retinal pathology, no new symptoms suggestive of retinal disease, and no evidence of progressive sight-threatening abnormalities. In these patients, the refractive error alone should not determine the mode of delivery.

The second category, intermediate ophthalmological concern, includes women with peripheral retinal degeneration, previously treated retinal breaks, a history of retinal detachment surgery, or other structural abnormalities requiring individualized follow-up. The ophthalmologist should document the stability of the retinal findings and determine whether additional monitoring or treatment is indicated. These findings do not automatically require cesarean delivery.

The third category, high ophthalmological concern, includes women with suspected or confirmed active retinal detachment, symptomatic retinal breaks, or progressive sight-threatening retinal or macular pathology. These patients require urgent specialist assessment and coordinated ophthalmological and obstetric management. These categories are descriptive rather than validated predictive classifications. They are intended to support consistent clinical communication and must not be interpreted as providing a quantified probability of retinal complications.

Stage 4. Management of retinal pathology. Women without active retinal disease should receive follow-up according to their clinical findings and symptoms. If a retinal tear or other potentially significant lesion is identified, the ophthalmologist should determine whether treatment is indicated. Laser retinopexy may be appropriate for selected retinal breaks or lesions considered clinically significant. However, prophylactic treatment should not be performed routinely for every peripheral degenerative change solely because the patient is pregnant or has high myopia. Established retinal detachment requires urgent assessment by a retinal specialist. Decisions regarding intervention and subsequent delivery planning should take into account the severity of the pathology, the response to treatment, gestational age, and maternal–fetal circumstances. Active myopic macular neovascularization or other progressive macular disease also requires specialist management, with treatment decisions adapted to pregnancy.

Stage 5. Selection of delivery management. Vaginal delivery is generally an appropriate option for women with stable retinal findings and no independent obstetric contraindication. High myopia alone does not justify routine cesarean delivery or instrumental vaginal delivery.

For women with intermediate ophthalmological concern, the delivery plan should be individualized through documented consultation between the obstetrician and ophthalmologist. The decision should reflect the exact retinal abnormality, its stability, previous interventions, and the overall obstetric situation.

Women with active sight-threatening pathology require coordinated specialist planning. Cesarean delivery may be considered when a specific ophthalmological indication is established by the treating specialists or when an independent obstetric indication exists. The decision should not be based solely on a theoretical concern about transient intraocular pressure changes during labor.

Stage 6. Intrapartum and postpartum surveillance. Standard obstetric monitoring should be maintained during labor. New visual symptoms should be assessed promptly, and women with previous retinal disease should follow the individualized recommendations of their ophthalmologist. Postpartum assessment should depend on the initial retinal findings, previous interventions, and any new symptoms. Sudden visual deterioration, new flashes, a marked increase in floaters, or a curtain-like shadow requires urgent ophthalmological evaluation.

The proposed algorithm emphasizes that the principal determinant of management is the condition of the retina rather than the refractive measurement alone. It also provides a clear basis for communication between ophthalmologists and obstetricians, reducing the likelihood of unnecessary operative delivery while maintaining attention to active sight-threatening disease.

Discussion: The findings of the present literature review indicate that high myopia during pregnancy should be evaluated as a condition requiring individualized ophthalmological assessment rather than as an automatic indication for operative delivery. Although high myopia is associated with an increased background risk of retinal complications, the available evidence does not establish that physiological vaginal delivery independently causes retinal detachment in

women with stable retinal findings. The observational study by Neri and colleagues demonstrated no deterioration in retinal abnormalities among 50 women examined before and after delivery [5]. Similarly, Landau and colleagues reported no postpartum changes in retinal status among 10 women who experienced 19 deliveries and had a history of retinal detachment or other predisposing retinal abnormalities [6]. These findings support the possibility of vaginal delivery in appropriately assessed patients. However, the small sample sizes and observational nature of these studies prevent definitive conclusions about rare complications. An important clinical distinction concerns the mechanisms underlying retinal detachment. High myopia may contribute to structural retinal vulnerability, but the presence of a high refractive error does not establish that an active retinal break or detachment exists. Therefore, the clinical decision should be based on ophthalmological examination, the nature of any identified lesion, the patient's symptoms, and the history of previous retinal interventions. The proposed algorithm addresses this distinction through sequential assessment, descriptive risk classification, management of identified pathology, and coordinated delivery planning. Its potential value lies in reducing decisions based solely on refractive measurements and encouraging documented communication between ophthalmologists and obstetricians. Nevertheless, the proposed categories should not be interpreted as a validated prediction score. The available studies do not provide sufficient standardized data to calculate reliable numerical probabilities of retinal complications for individual patients. The algorithm is therefore intended to organize clinical reasoning rather than replace specialist judgment. A further consideration is the management of active retinal and macular disease. Patients with symptomatic retinal breaks, established retinal detachment, or progressive myopic macular pathology require condition-specific assessment. In these circumstances, the timing of treatment, gestational age, maternal visual prognosis, and obstetric factors should all be considered. A universal delivery recommendation cannot be justified for every form of retinal disease. The review also has several limitations. The literature includes relatively small observational cohorts, heterogeneous ophthalmological examination protocols, and limited prospective evidence. Furthermore, studies differ in their definitions of high myopia and in the retinal abnormalities included in their analyses. Consequently, the proposed algorithm should be evaluated in prospective clinical studies before it is adopted as a validated risk-stratification instrument. Future research should involve multicenter cohorts with standardized pre-delivery and postpartum retinal examinations. Such studies should document refractive error, axial length where available, peripheral retinal findings, previous retinal treatment, mode of delivery, maternal visual outcomes, and obstetric complications. This approach would help determine whether specific anatomical findings identify patients who require a modified management strategy.

Conclusion and practical recommendations: High myopia during pregnancy requires a structured approach that distinguishes refractive severity from the presence of clinically significant retinal pathology. The available literature does not support routine cesarean delivery

solely because a pregnant woman has high myopia. In most women with stable retinal findings and no independent obstetric contraindications, vaginal delivery remains an appropriate option. The proposed algorithm provides a framework for identifying retinal abnormalities, determining the need for specialist intervention, and coordinating ophthalmological and obstetric decision-making. Its principal objective is to support individualized delivery planning while avoiding unnecessary operative interventions and maintaining appropriate protection of maternal visual health.

The following practical recommendations are proposed:

1. Pregnant women with high myopia should undergo appropriate ophthalmological assessment, particularly when a recent retinal examination is unavailable or additional risk factors are present.
2. The examination should prioritize retinal anatomy and clinical symptoms rather than relying exclusively on refractive error.
3. High myopia alone should not be considered an automatic indication for cesarean delivery, instrumental vaginal delivery, or routine shortening of the second stage of labor.
4. Retinal tears, suspected retinal detachment, and other potentially sight-threatening abnormalities should be evaluated promptly by an ophthalmologist. Treatment should be determined by the characteristics and clinical significance of the lesion.
5. Prophylactic retinal treatment should not be recommended routinely for every peripheral degenerative change solely because the patient is pregnant or has high myopia.
6. Women with active retinal disease, progressive macular pathology, or recent retinal surgery should receive individualized recommendations through documented consultation between the ophthalmologist and obstetrician.
7. Postpartum follow-up should be based on the initial retinal findings, previous treatment, and the development of new visual symptoms.

In conclusion, a retinal-focused and multidisciplinary approach offers a clinically reasoned basis for managing high myopia in pregnancy. However, the proposed algorithm remains an evidence-informed framework rather than a validated prediction model. Prospective studies are required to establish its clinical utility, reproducibility, and impact on maternal and neonatal outcomes.

References:

1. Flitcroft D.I., He M., Jonas J.B., Jong M., Naidoo K., Ohno-Matsui K., et al. IMI—Defining and classifying myopia: A proposed set of standards for clinical and epidemiologic studies. Investigative Ophthalmology & Visual Science. 2019;60(3):M20–M30. Publisher: Association for Research in Vision and Ophthalmology.

2. Williams K.M., Hammond C.J. High myopia and its risks. Community Eye Health. 2019;32(105):5. Publisher: International Centre for Eye Health.

3. Garg P., Aggarwal P., Garg S., et al. Ocular changes in pregnancy. Nepalese Journal of Ophthalmology. 2012;4(1):150–161. Publisher: Nepal Ophthalmic Society.

4. Rzeszotarska A., Szczapa-Jagustyn J., Kociecki J. Ophthalmological problems in pregnancy: A review. Ginekologia Polska. 2020;91(8):473–477. Publisher: Via Medica.

5. Neri A., Grausbord R., Kremer I., Ovadia J., Treister G. The management of labor in high myopic patients. European Journal of Obstetrics & Gynecology and Reproductive Biology. 1985;19(5):277–279. Publisher: Elsevier. DOI: 10.1016/0028-2243(85)90041-3.

6. Landau D., Seelenfreund M.H., Tadmor O., Silverstone B.Z., Diamant Y. The effect of normal childbirth on eyes with abnormalities predisposing to rhegmatogenous retinal detachment. Graefe's Archive for Clinical and Experimental Ophthalmology. 1995;233(9):598–600. Publisher: Springer. DOI: 10.1007/BF00404712.

7. Sapuła-Grabowska M., Ciszewska J., Brydak-Godowska J., Sawa A., Laszewicz P., Bartha E., Pietrzak B. Delivery in myopic women: A comparison of mode of delivery in years 1990, 2000, and 2010. Medical Science Monitor. 2019;25:7715–7719. Publisher: International Scientific Information, Inc. DOI: 10.12659/MSM.916479.

8. Sumual V., Chandra A.P., Sutanto R.L. High-grade myopia and vaginal delivery: A narrative review. Science Midwifery. 2024;12(4):1552–1557. Publisher: IOCS Publisher. DOI: 10.35335/midwifery.v12i4.1700.

9. Zakirkhojaev R.A., Shavkatkhujaev K.N. Refractive changes in pregnancy. In: Materials of the Republican Multidisciplinary Scientific Remote Online Conference "Scientific and Practical Research in Uzbekistan". Tashkent: Tadqiqot Publishing House; 2020. Conference collection, issue 18, section "Biomedical Research and Practice," pp. 12–13. Publisher: Tadqiqot LLC.

10. Du Y., Meng J., He W., Qi J., Lu Y., Zhu X. Complications of high myopia: An update from clinical manifestations to underlying mechanisms. Advances in Ophthalmology Practice and Research. 2024;4(3):156–163. Publisher: Elsevier. DOI: 10.1016/j.aopr.2024.06.003.