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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии
საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

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GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

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WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman (Кириллица)**, для текста на грузинском языке следует использовать **AcadNusx**. Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - <http://www.spinesurgery.ru/files/publish.pdf> и http://www.nlm.nih.gov/bsd/uniform_requirements.html В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректур авторам не высылаются, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or computer-printed on a single side of standard typing paper, with the left margin of 3 centimeters width, and 1.5 spacing between the lines, typeface - **Times New Roman (Cyrillic)**, print size - 12 (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf

In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

**Articles that Fail to Meet the Aforementioned
Requirements are not Assigned to be Reviewed.**

ავტორთა საქურაღებოლ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დაიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx**. შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრაფიების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შედეგების ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფხიხლებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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CORRELATION BETWEEN PREOPERATIVE MACULAR THICKNESS AND POSTOPERATIVE VISUAL PROGNOSIS IN PATIENTS WITH DIABETIC CATARACT

Hua-ting Bi*, Wen-Wen Hao.

¹Department of ophthalmology, Jiaozhou Central Hospital of Qingdao, Jiaozhou 266300, Shandong, China.

Correspondence to: Huating Bi, Department of ophthalmology, Jiaozhou Central Hospital, No. 29 Xuzhou Road, Qingdao, Shandong, 266300, P.R. China.

Email: Bitingtinghao@163.com

Abstract.

To analyze the association between preoperative macular thickness (MT) and the visual prognosis after surgery in patients with diabetic cataract (DC), and to provide some references for preoperative evaluation and surgery selection. Approach: From January 2024 to September 2025, a retrospective analysis was conducted on 80 DC patients (80 eyes) who underwent phacoemulsification concomitant with IOL implantation at Jiaozhou Central Hospital of Qingdao. All patients underwent optical coherence tomography (OCT) examination preoperatively to observe the CMT and MT-3mm (the macular thickness in 3mm diameter area). Depending on CMT before surgery, the patients were classified into three groups. The normal group consisted of those with CMT less than 250 μm (n=27). The mild thickening group consisted of those with CMT greater than or equal to and less than 250 (n=32). Finally, the moderate/severe thickening group consisted of those with CMT greater than or equal to 300 μm (n=21). We took note of the best corrected visual acuity (BCVA, converted to logMAR) before surgery, then at 1 month and 3 months after. Statistical methods were used to analyze the correlation between preoperative MT and postoperative BCVA, and to explore the influencing factors of postoperative visual prognosis. Results: There was no statistically significant difference in preoperative BCVA ($P > 0.05$) between the three groups. According to the results obtained, at the time point of 1 month and 3 months after the operation, the normal group had significantly better BCVA than the group with mild thickening and moderate-severe thickening group ($P < 0.05$), and that the group with mild thickening had better BCVA than the moderate-severe thickening group ($P < 0.05$). According to the Pearson correlation analysis, preoperative CMT and MT-3mm positively correlated with postoperative 1-month and 3-month logMAR BCVA ($r=0.623, 0.589, 0.651, 0.617$; all $P < 0.001$). The analysis of multivariate linear regression revealed that CMT prior to the surgery ($\beta=0.412, P < 0.001$) and duration of diabetes ($\beta=0.235, P=0.021$) were influential postoperative 3-month BCVA factors. Conclusion: Macular thickness before surgery is closely related to visual prognosis after surgery in DC patients. Patients with thicker preoperative macular thickness had worse visual recovery post-operatively. Preoperative OCT measurement of macular thickness can be regarded as an important reference for evaluating its visual prognosis after surgery.

Key words. Diabetic cataract, macular thickness, visual prognosis, optical coherence tomography, correlation analysis.

Introduction.

Diabetic cataract (DC) is one of the most common complications

of diabetes mellitus, and it is also a major cause of visual impairment in diabetic patients [1]. The growing incidence of DC is seriously impairing the quality of life of patients as the prevalence of diabetes mellitus rises globally year by year [2,3]. Phacoemulsification and IOL implantation is the surgery method of choice for DC that can greatly enhance the visual acuity in the majority of patients. Despite surgery, the visual outcomes of some patients remain poor. This is incidentally associated with various factors such as diabetic retinopathy (DR), macular edema (ME) and other fundus lesions. The Most Common Fundus Complication of Diabetic Patient Is Macular Edema Which May Occur at Any Stage of Diabetes and It Is an Important Cause of Loss of Vision [4]. Even in diabetic cataract patients without clear diabetic retinopathy manifestations, subclinical macular thickening may exist affecting postoperative visual recovery [5]. Optical coherence tomography (OCT) is a well-known, non-invasive imaging method that has a high-resolution capacity. It is capable of accurately measuring the thickness of the macula and detecting early structural changes in the macula. Furthermore, this imaging method is widely used in diagnosing and following the treatment of fundus diseases [6]. At present, the correlation between postoperative macular edema and visual prognosis has been studied more actively in recent years. However, few studies examined the correlation between preoperative macular thickness and postoperative visual recovery in DC patients. A retrospective analysis was done on 80 patients with DC who underwent surgical treatment in our hospital during the years 2024-2025. Such a study explored the correlation between preoperative macular thickness and the visual prognosis after surgery. It provided a theoretical basis for preoperative assessment and individualized treatment of DC patients.

Materials and Methods.

Study Objects: This study involved a retrospective cohort design with 80 DC patients (80 eyes) who were admitted at our Ophthalmology Department, Jiaozhou Central Hospital of Qingdao, and underwent phacoemulsification combined with IOL implantation from January 2024 to September 2025. The subjects included patients aged 50-70 years, patients with a diagnosis of type 2 diabetes mellitus according to the diagnostic criteria of the World Health Organization (WHO) [7], patients diagnosed by slit lamp examination with diabetic cataract (DC), and the lens opacity affects visual acuity (BCVA ≤ 0.5 logMAR), and no history of ophthalmic surgery. The exclusion criteria stipulate that any patient complicated by age-related macular degeneration, retinal vein occlusion, or retinal artery occlusion will be excluded from the study subject.

Similarly, we will exclude any patient who is complicated by glaucoma, uveitis and corneal opacity and other diseases that might affect visual acuity. Besides that, any patient complicated by serious systemic diseases like heart failure, renal failure is excluded from our study. Similarly, we will exclude any patient with postoperative complications like endophthalmitis, retinal detachment. Finally, we will exclude any patient who lost to follow up.

The aim of the study was to investigate the correlation between preoperative macular thickness (MT) and the visual prognosis after surgery in patients with diabetic cataract (DC), and to provide some references for preoperative evaluation and surgery selection. From January 2024 to September 2025 retrospective study was carried out on 80 cases (80 eyes) of DC patients who had undergone phacoemulsification with IOL at Jiaozhou Central Hospital of Qingdao. To assess the CMT (central macular thickness) and MT-3mm (macular thickness in 3mm diameter area), all patients underwent optical coherence tomography (OCT) examination preoperatively. The patients were categorized into three groups based on CMT before surgery. The normal group was defined as those that had CMT (0.05) between all three groups. Based on the findings, at 1 month and 3 months post-operation, BCVA in the normal group was significantly better than the mild thickening group and moderate-severe thickening group ($P < 0.05$). Mild thickening group also had better BCVA than the moderate-severe thickening group ($P < 0.05$). According to Pearson correlation analysis, preoperative CMT, MT-3mm were positively correlated with a logMAR BCVA at the postoperative month 1 and month 3 ($r=0.623, 0.589, 0.651, 0.617$; all $P < 0.001$) According to the multivariate linear regression analysis, CMT before surgery ($\beta=0.412, P < 0.001$) and duration of diabetes ($\beta=0.235, P=0.021$) were significant factors of postoperative 3-month BCVA. The macular thickness before surgery in DC patients is related to their visual prognosis. Patients whose preoperative macular thickness was greater had poorer visual recovery post-operatively. Preoperative OCT measurements of macular thickness may be a useful reference for the visual prognosis after surgery.

Examination and Surgical Methods:

All patients underwent comprehensive ophthalmic examination before surgery, including visual acuity, intraocular pressure (IOP), slit lamp examination, fundus examination, OCT examination and fasting blood glucose, glycated hemoglobin (HbA1c) detection. OCT examination was performed using a spectral domain OCT instrument (Spectralis, Heidelberg, Germany) [6], and the macular scan mode was adopted to measure CMT (the thickness of the central 1mm diameter area of the macula) and MT-3mm (the average thickness of the 3mm diameter area of the macula). BCVA was measured by standard visual acuity chart and converted to logMAR value for statistical analysis.

All surgeries were performed by the same senior ophthalmologist. Phacoemulsification combined with foldable IOL implantation was performed under topical anesthesia [8]. The surgical process was as follows: a 2.2mm clear corneal incision was made, continuous curvilinear capsulorhexis was performed, phacoemulsification of lens nucleus was performed,

cortical aspiration was performed, and foldable IOL was implanted into the capsular bag. Postoperative medications: tobramycin dexamethasone eye drops were used 4 times a day, and the dosage was gradually reduced; pranoprofen eye drops were used 4 times a day to relieve inflammation. Postoperative follow-up was performed at 1 month and 3 months, including BCVA measurement, IOP detection and fundus examination.

Statistical Methods:

The data was analyzed using the statistical software SPSS 26.0. Measurement data comply with normal distribution was expressed as mean \pm standard deviation ($\bar{x} \pm s$), and one-way analysis of variance (ANOVA) was used for comparison between multiple groups; pairwise comparison was performed by LSD method. Outcomes with count data were expressed as rate (%), and used chi-square test for comparison. The Pearson correlation test was employed to determine the relationship between macular thickness prior to surgery and postoperative BCVA. A p-value less than 0.05 was considered to be statistically significant.

Results.

General Data of the Three Groups:

There was no statistically significant difference in gender, age, diabetes duration, HbA1c level, preoperative IOP and preoperative BCVA between the three groups ($P > 0.05$), as shown in Table 1.

Comparison of Postoperative BCVA between the Three Groups:

At 1 month and 3 months postoperatively, the logMAR BCVA of the three groups was significantly lower than that before surgery ($P < 0.05$). At 1 month postoperatively, the logMAR BCVA of the normal group was (0.32 ± 0.11), which was significantly lower than that of the mild thickening group (0.45 ± 0.13) and moderate-severe thickening group (0.61 ± 0.15) ($P < 0.05$); the logMAR BCVA of the mild thickening group was lower than that of the moderate-severe thickening group ($P < 0.05$). At 3 months postoperatively, the logMAR BCVA of the normal group was (0.25 ± 0.09), which was significantly lower than that of the mild thickening group (0.38 ± 0.12) and moderate-severe thickening group (0.53 ± 0.14) ($P < 0.05$); the logMAR BCVA of the mild thickening group was lower than that of the moderate-severe thickening group ($P < 0.05$). The BCVA of each group at 3 months postoperatively was better than that at 1 month postoperatively ($P < 0.05$), as shown in Table 2.

Note: Compared with preoperative, $P < 0.05$; compared with moderate-severe thickening group, $P < 0.05$; compared with 1 month postoperatively, $P < 0.05$.

Correlation between Preoperative Macular Thickness and Postoperative BCVA:

Pearson correlation analysis showed that preoperative CMT and MT-3mm were positively correlated with postoperative 1-month and 3-month logMAR BCVA (all $P < 0.001$). That is, the thicker the preoperative macular thickness, the higher the logMAR BCVA (the worse the visual acuity), as shown in Table 3.

Table 1. There was no statistically significant difference in gender, age, diabetes duration, HbA1c level, preoperative IOP and preoperative BCVA between the three groups ($P > 0.05$).

Group	n	Gender (Male/ Female)	Age ($\bar{x} \pm s$, years)	Diabetes Duration ($\bar{x} \pm s$, years)	HbA1c ($\bar{x} \pm s$, %)	Preoperative IOP ($\bar{x} \pm s$, mmHg)	Preoperative logMAR BCVA ($\bar{x} \pm s$)
Normal group	27	15/12	64.8 \pm 7.5	8.9 \pm 3.8	7.2 \pm 1.1	15.3 \pm 2.1	0.78 \pm 0.15
Mild thickening group	32	18/14	65.5 \pm 7.1	9.7 \pm 4.2	7.4 \pm 1.2	15.6 \pm 2.3	0.81 \pm 0.16
Moderate-severe thickening group	21	10/11	66.1 \pm 6.8	10.3 \pm 4.5	7.6 \pm 1.3	15.8 \pm 2.2	0.83 \pm 0.17
F/ χ^2 value	-	0.326	0.345	0.987	0.762	0.413	0.528
P value	-	0.849	0.708	0.375	0.470	0.662	0.591

Note: HbA1c = glycated hemoglobin; IOP = intraocular pressure; BCVA = best corrected visual acuity.

Table 2. Comparison of Postoperative BCVA between the Three Groups.

Group	n	Preoperative	1 Month Postoperatively	3 Months Postoperatively
Normal group	27	0.78 \pm 0.15	0.32 \pm 0.11	0.25 \pm 0.09
Mild thickening group	32	0.81 \pm 0.16	0.45 \pm 0.13	0.38 \pm 0.12
Moderate-severe thickening group	21	0.83 \pm 0.17	0.61 \pm 0.15	0.53 \pm 0.14
F value	-	0.528	38.652	45.327
P value	-	0.591	< 0.001	< 0.001

Note: Compared with preoperative, $P < 0.05$; compared with moderate-severe thickening group, $P < 0.05$; compared with 1 month postoperatively, $P < 0.05$.

Table 3. Correlation between Preoperative Macular Thickness and Postoperative BCVA.

Preoperative Index	1 Month Postoperative logMAR BCVA (r, P)	3 Months Postoperative logMAR BCVA (r, P)
CMT (μm)	0.623, < 0.001	0.651, < 0.001
MT-3mm (μm)	0.589, < 0.001	0.617, < 0.001

Note: CMT = central macular thickness; MT-3mm = macular thickness in 3mm diameter area.

Independent Influencing Factors of Postoperative 3-Month BCVA:

Taking postoperative 3-month logMAR BCVA as the dependent variable, and gender, age, diabetes duration, HbA1c level, preoperative CMT, preoperative IOP as independent variables, multivariate linear regression analysis was performed. The results showed that preoperative CMT ($\beta=0.412$, $P < 0.001$) and diabetes duration ($\beta=0.235$, $P=0.021$) were independent influencing factors of postoperative 3-month BCVA.

Discussion.

Diabetic cataracts are a relatively common eye disease that occurs in clinical practice. The main way to restore visual function is through surgical treatment. However, a relatively high number of diabetes often exists in the fundus of DC patients which led to structural and functional changes affecting postoperative visual recovery. The macula is the most sensitive part of the visual function and requires structural integrity for good visual acuity. The thickness of the macula is an important indicator of the structural changes of the macula, and its changes are closely related to visual functions [9]. As per this study, the pre-operative BCVA of the three groups was not statistically different from each other. However, after surgery, the post-operative visual acuity of the group with normal pre-operative macular thickness was statistically better than the groups with macular thickening. The visual acuity of the mild thickening group was better than the moderate-severe

thickening group. Preoperative macular thickness is closely linked to postoperative visual recovery. Preoperative macular thickening, though clinically silent, may imply subclinical macular damage related to microvascular leakage and retinal tissue edema, which diminishes the transmission of light signals and leads to poor visual recovery after surgery [4]. The visual acuity of patients can be further improved with the recovery of macular edema after surgery, which is in accordance with the result that the BCVA of each group at 3 months postoperatively is better than that of 1 month postoperatively.

According to the results of the Pearson correlation analysis, the pre-op CMT and MT-3mm (macular thickness measured at 3mm) were positively correlated with the logMAR BCVA post-operatively. In other words, the thicker the pre-op macular thickness the worse the visual prognosis will be post-operatively. According to research results from Wang et al. [10], the preoperative macular thickness is one of the important predictors of postoperative visual acuity in patients with DC. The use of multivariable linear regression analysis shows that CMT pre-operation and duration of diabetes are independent impact factor for visual prognosis post-operation [11]. On the basis of above assessment findings, it was concluded that in clinical practice, for DC patients with long diabetes duration and thick preoperative macular thickness, attention should be focused on preoperative assessment and postoperative follow-up as well as on implementing corresponding intervention measures to improve visual prognosis. Optical coherence tomography

is capable of accurate macular thickness measurements and has detected early macular structural changes [12]. This has important clinical value for the pre-operative evaluation of DC patients. For diabetic cataract patients with preoperative macular thickening especially moderate-severe thickening preoperative anti-VEGF treatment may be considered to lessen the macular edema and improve post-surgery visual recovery [13]. Furthermore, maintaining a steady blood glucose and blood pressure control in diabetic patients can delay the progression of their macular damage [14], and improve the effectiveness of surgical treatment.

This research has some limitations.

First, it is a retrospective research with small sample size (80 cases), which would possibly induce selection bias; second, the follow-up time is only 3 months and whether the preoperative macular thickness is correlated with visual prognosis in the long run needs to be further followed [15]; third, this research only monochrome measure macular thickness, there is no analysis of other macular structure parameters, such as macular volume and retinal layer thickness. In future investigations involving larger samples and prolonged follow-up, it would be interesting to examine the link between preoperative macular structural changes and postoperative outlook, in order to provide a more comprehensive reference for clinical application.

Conclusion.

Irisin is a multifunctional myokine secreted by adipocytes, cardiac myocytes, and skeletal muscle, possibly mediating a wide range of metabolic processes including insulin resistance, muscle endurance, endothelial function, inflammatory and immune reactions and bone osteoblast activity. The present study demonstrated a significant correlation between preoperative macular thickness and postoperative visual prognosis in patients with diabetic cataract. Increased preoperative macular thickness was associated with poorer postoperative visual recovery. Preoperative central macular thickness (CMT) and duration of diabetes were identified as two independent predictive factors for postoperative visual outcomes. Therefore, routine OCT evaluation of macular thickness before surgery is clinically valuable, as it can help clinicians to objectively estimate postoperative visual prognosis, facilitate risk stratification, and guide the formulation of individualized therapeutic strategies for patients with diabetic cataract.

Conflict of interest statement.

The authors declare that this research was conducted in the absence of any business or financial relationships that could be construed as potential conflicts of interest.

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