UNIVERSITAS TRISAKTI

dr. Yenny <yennyfarmako@trisakti.ac.id>

[MJI] Article Review Request (ID:8671)

3 messages

mji@fk.ui.ac.id <mji@fk.ui.ac.id> Mon, May 25, 2026 at 10:55 AM
Reply-To: Raul Gonzales <raulgonzales043@gmail.com>
To: Yenny Yenny <yennyfarmako@trisakti.ac.id>

Dear Dr. Yenny Yenny:

I believe that you would serve as an excellent reviewer of the manuscript, "Effects of oral vitamin C on oxidative stress biomarker level in hard cataract patients: a randomized control trial," which has been submitted to Medical Journal of Indonesia. The submission's abstract is inserted below, and I hope that you will consider undertaking this important task for us.

Please log into the journal web site by 2026-06-01 to indicate whether you will undertake the review or not, as well as to access the submission and to record your review and recommendation.

The review itself is due 2026-06-08.

Submission URL: https://mji.ui.ac.id/journal/index.php/mji/reviewer/submission?submissionId=8671&reviewId=7807&key=mQFnER

Thank you for considering this request.

Raul Gonzales
Universitas Indonesia
raulgonzales043@gmail.com

"Effects of oral vitamin C on oxidative stress biomarker level in hard cataract patients: a randomized control trial"

Abstract

Background: Ascorbic acid (AA) is a major contributor to total antioxidant capacity (TAC) within intraocular tissues and fluids, where it plays a critical role in neutralizing oxidative stress. Oxidative stress is implicated in cataractogenesis and is further exacerbated during cataract surgery, particularly phacoemulsification, which generates hydroxyl radicals and induces lipid peroxidation, reflected by increased malondialdehyde (MDA) levels. This study aimed to evaluate the effect of seven days of oral vitamin C supplementation on oxidative stress biomarkers (AA, TAC, and MDA) in plasma and aqueous humor of patients with hard cataracts.

Methods: This double-blind randomized controlled trial enrolled patients with hard cataracts, who were allocated to receive either oral vitamin C (500 mg three times daily) or placebo for seven days prior to surgery. Levels of AA, TAC, and MDA were measured in plasma before and after the intervention, as well as in aqueous humor collected intraoperatively.

Results: Eighty-five patients were included, with 45 in the vitamin C group and 40 in the placebo group. No significant differences were observed between groups in plasma AA, TAC, or MDA levels before or after the intervention ($p > 0.05$). In contrast, TAC levels in the aqueous humor were significantly higher in the vitamin C group compared with the placebo group (1310.45 ± 645.03 µmol/L vs 944.31 ± 545.35 µmol/L; $p < 0.001$). However, aqueous humor AA and MDA levels did not differ significantly between groups ($p > 0.05$).

Conclusion: Seven days of oral vitamin C supplementation significantly enhances total antioxidant capacity in the aqueous humor but does not induce measurable changes in plasma or aqueous humor AA and MDA levels in patients with hard cataracts. These findings suggest

a localized antioxidant effect within the anterior chamber, while highlighting the limited impact of short-term oral supplementation on systemic and intraocular oxidative stress biomarkers.

dr. Yenny <yennyfarmako@trisakti.ac.id> Tue, Jun 2, 2026 at 9:17 PM
To: Raul Gonzales <raulgonzales043@gmail.com>

Dear Mr Rauo Gonzales

I accept your request to review the manuscript

Thank you
Sincerely yours
Yenny
[Quoted text hidden]

---

dr. Yenny <yennyfarmako@trisakti.ac.id> Sun, Jun 7, 2026 at 12:14 PM
To: Raul Gonzales <raulgonzales043@gmail.com>

Dear Raul Gonzales

Sorry to disturb you again
Can I obtain a certificate after completing the review process for the previously assigned manuscript entitled "Effects of oral vitamin C on oxidative stress biomarker levels in hard cataract patients?"

Thank you for your kind
Sincerely yours
Yenny
[Quoted text hidden]

Effects of oral vitamin C on oxidative stress biomarker level in hard cataract patients: a randomized control trial

Abstract

Background: Ascorbic acid (AA) is a major contributor to total antioxidant capacity (TAC) within intraocular tissues and fluids, where it plays a critical role in neutralizing oxidative stress. Oxidative stress is implicated in cataractogenesis and is further exacerbated during cataract surgery, particularly phacoemulsification, which generates hydroxyl radicals and induces lipid peroxidation, reflected by increased malondialdehyde (MDA) levels. This study evaluated the effect of seven days of oral vitamin C supplementation on oxidative stress biomarkers (AA, TAC, and MDA) in plasma and aqueous humor of patients with hard cataracts.

Methods: This double-blind randomized controlled trial enrolled patients with hard cataracts, who were allocated to receive either oral vitamin C (500 mg three times daily) or placebo for seven days prior to surgery. Levels of AA, TAC, and MDA were measured in plasma before and after the intervention, as well as in aqueous humor collected intraoperatively.

Results: 85 patients were enrolled, with 45 assigned to the vitamin C group and 40 to the placebo group. No significant differences were observed between groups in plasma AA, TAC, or MDA levels before or after the intervention ($p > 0.05$). In contrast, TAC levels in the aqueous humor was significantly higher in the vitamin C group than in the placebo group (1310.45 ± 645.03 µmol/L vs 944.31 ± 545.35 µmol/L; $p < 0.001$). However, aqueous humor AA and MDA levels did not differ significantly between groups ($p > 0.05$).

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Keywords: cataract, phacoemulsification, oxidative stress, vitamin C, antioxidant.

Clinical trial registration: The trial was registered at www.clinicaltrials.gov (NCT06781970).

INTRODUCTION

Cataract, defined as progressive opacification of the ocular lens, remains the leading cause of blindness and visual impairment worldwide. In Indonesia, the prevalence of blindness reached approximately 1.4% in 2020, with cataract accounting for more than 80% of cases, corresponding to nearly three million affected individuals. As aging is a major risk factor for cataract development, the national burden of cataract-related blindness is expected to increase further in parallel with demographic aging, with the geriatric population in Indonesia projected to reach 20% by 2045.[1,2]

Oxidative stress within the aqueous humor plays a central role in cataractogenesis, arising from chronic exposure to ultraviolet (UV) radiation and endogenous metabolic processes.[3] Beyond its role in lens opacification, oxidative stress is also critically involved in cataract surgery–related tissue injury. Phacoemulsification, the standard surgical technique for cataract extraction, generates additional free radicals as a result of ultrasound energy. Acoustic cavitation during ultrasound exposure leads to bubble formation and sonolysis within the aqueous humor, initiating the production of reactive oxygen species (ROS). These free radicals activate oxidative stress pathways in corneal endothelial cells, ultimately contributing to endothelial cell dysfunction and loss.[4,5] Thus, oxidative stress represents a shared pathogenic mechanism linking cataract formation and postoperative corneal endothelial damage.

One of the key biochemical consequences of oxidative stress is lipid peroxidation, in which free radicals interact with membrane lipids to generate cytotoxic byproducts such as malondialdehyde (MDA). MDA is widely recognized as a reliable biomarker of oxidative stress

and cellular membrane damage in ocular tissues.[5] Counteracting oxidative injury requires a robust antioxidant defense system. Within intraocular tissues and fluids, ascorbic acid (AA) serves as the predominant antioxidant and a major determinant of total antioxidant capacity (TAC).[6] However, previous studies have demonstrated that AA concentrations in the aqueous humor decline with advancing age, particularly in patients with age-related cataracts, potentially increasing susceptibility to oxidative damage.[7]

Despite growing evidence supporting the protective role of vitamin C against oxidative injury during cataract surgery, current data predominantly focus on clinical endpoints such as corneal endothelial cell density, while the biochemical effects of oral vitamin C on intraocular oxidative stress markers remain insufficiently characterized. In particular, it is unclear whether short-term oral supplementation can meaningfully modulate ascorbic acid availability, total antioxidant capacity, and lipid peroxidation within the aqueous humor, especially in patients with hard nuclear cataracts, a subgroup exposed to higher ultrasound energy and oxidative burden during phacoemulsification. Furthermore, the relationship between systemic antioxidant changes and localized intraocular redox status has not been adequately elucidated. This lack of mechanistic evidence limits the rational optimization of perioperative antioxidant strategies in cataract surgery. Based on these considerations, we therefore hypothesized that short-term oral vitamin C supplementation would significantly increase plasma and aqueous humor AA and TAC levels while decreasing MDA levels compared with placebo.

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METHODS

This was a randomized, double-blind, parallel-group controlled trial with a 1:1 allocation. It aimed to evaluate the effect of oral vitamin C on oxidative stress markers AA, TAC, and MDA in plasma and aqueous humor of patients with hard nucleus cataracts who underwent phacoemulsification. The trial was registered in ClinicalTrials.gov (NCT06781970).

Participants were recruited from regional hospitals in Cianjur, West Java, and Serang, Banten, Indonesia, using a total sampling method. The required sample size was set at a minimum of 40 subjects per group, based on a 95% confidence level and 90% statistical power ($\beta = 0.10$; $\alpha = 0.05$), assuming an expected difference of 0.25 µmol/L in aqueous humor MDA levels following oral vitamin C administration in the intervention group.

Eligible participants were individuals aged over 60 years with senile cataracts in one or both eyes, graded as nuclear opacity 4–6 and nuclear color 4–6 according to the Lens Opacities Classification System (LOCS) III. All participants were required to provide written informed consent, comply with the prescribed treatment, and complete a seven-week follow-up period from enrollment. Exclusion criteria included hypersensitivity to vitamin C; occurrence of intraoperative complications or postoperative infections; presence of corneal endothelial disorders; prior intraocular surgery; glaucoma, ocular trauma, or intraocular inflammation; as well as comorbid diabetes mellitus, renal disease, or routine use of vitamin supplements. Participants were withdrawn if they were lost to follow-up or demonstrated poor adherence, defined as consumption of less than 80% of the prescribed medication, as assessed by pill count one week after the intervention.

The primary outcome was mean change in serum and aqueous humor levels of ascorbic acid (AA), functioning as a main antioxidant, and malondialdehyde (MDA), used as an oxidative stress biomarker, measured at pre-intervention and after seven days of supplementation and compared between the two groups. The secondary endpoint was mean change in total antioxidant capacity (TAC) acting as a potential antioxidant capacity in both plasma and aqueous humor over the same period.

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clarify in the text that Participation in the trial was entirely voluntary, and refusal to participate did not alter, delay, or affect the patient's eligibility or access to the mass cataract surgery program

Intervention and Sampling Procedures

Participants were recruited from a mass cataract surgery program conducted at regional hospitals in Cianjur and Serang. Baseline assessment included medical history taking and ocular examination (VA, IOP, lens grading, slit-lamp biomicroscopy, and fundoscopy). Blood samples were obtained to determine serum AA, MDA, and TAC.

A total of 85 eligible participants were randomly assigned using a computer-generated sequence with allocation concealment. Participants were allocated to a treatment group (n = 45), which received 500 mg of oral vitamin C three times daily and to a control group (n = 40), which received a placebo. Blinding was maintained for participants and investigators, and all procedures were performed using a standardized phacoemulsification technique.

Post-intervention assessment included monitoring of adverse events and repeat blood sampling. An initial sample (0.2 mL) was obtained following the first incision, followed by a second sample collected after viscoelastic removal. Preoperative samples were analyzed for AA, MDA, and TAC, whereas postoperative samples were analyzed for MDA only. All participants received standard postoperative topical antibiotics and corticosteroids.

Measurement of oxidative stress biomarkers

Blood and aqueous humor were analyzed at the Pharmacology Laboratory, Faculty of Medicine, University of Indonesia (FMUI). All procedures, from sample handling, including collection storage, and transport, were performed under strict time and temperature regulation to ensure stability, with transport duration not exceeding two hours. Blood samples were centrifuged within six hours at 1,000 G for 15 minutes to separate plasma, which was then stored at −80°C until analysis. Aqueous humor samples were maintained in dry ice at −78°C during transport and subsequently stored at −80°C for long-term preservation prior to testing.

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- Who manufactured the 500 mg vitamin C tablets?
- What was the placebo made of? Was it identical in size, color, texture, shape, and taste to the vitamin C tablet?

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- How was allocation concealed?
- Who held the blinding code?
- Blinding Check

Commented [A10]: Add more specific information about standardized phacoemulsification technique :
-What machine platform was used ?
-Did the surgeon use torsional, longitudinal, or micropulsed ultrasound
-Did you collect and compare the Cumulative Dissipated Energy (CDE) or Total Phaco Time between the two groups?

Oxidative stress parameters were evaluated using validated methods. Ascorbic acid concentrations were measured by ELISA, while total antioxidant capacity was assessed using the QuantiChrom™ Antioxidant Assay. Malondialdehyde levels in aqueous humor were determined using an ELISA kit, whereas plasma malondialdehyde levels were analyzed using a spectrophotometric technique. The study procedures followed our previously published preprint protocol.[8]

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Statistical analysis

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Statistical analysis was performed after all data were collected and the number of subjects was met. The unit of analysis was the patient. For patients undergoing bilateral phacoemulsification, only one eye per patient was included in the analysis, selected based on the first eye operated.

Data were processed and analyzed using IBM SPSS Statistics. Baseline characteristics were summarized descriptively. The distribution of numerical variables was assessed using the Shapiro–Wilk test; normally distributed data are presented as mean ± standard deviation, while non-normally distributed data are reported as median with interquartile range. Categorical variables are expressed as frequencies and percentages. Comparisons between groups were performed using the independent t-test or Mann–Whitney U test, as appropriate. Paired analyses were conducted using the paired t-test or Wilcoxon signed-rank test. Associations between categorical variables were evaluated using the Pearson chi-squared test. A p-value of <0.05 was considered statistically significant.

Ethical statement

Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine, University of Indonesia – Cipto Mangunkusumo Hospital (Ref: KET-1252/UN2.F1/ETIK/PPM.00.02/2024;

protocol no. 24-08-1198). Written informed consent was obtained from all participants prior to enrollment.

RESULT

A total of 85 patients were included in this study, with 45 assigned to the treatment group and 40 to the control group, as shown in Image1. A total of 4 participants in the control group did not complete the study, resulting in loss to follow-up.

(Figure 1)

As shown in Table 1, baseline demographic and clinical characteristics were compared between the two groups. The mean age was similar in both groups ($p = 0.091$), and no significant differences were observed in sex distribution, occupational sun exposure, or smoking history (all $p > 0.05$). Baseline visual acuity, measured in logMAR, was comparable between the treatment and control groups (2.48 vs. 2.47; $p = 0.272$). Regarding cataract density, the distribution across NO4NC4, NO5NC5, and NO6NC6 grades showed no statistically significant differences between groups ($p = 0.072$).

(Table 1)

The changes in serum AA, TAC, and MDA are summarized in Tables 2 and 3. Baseline serum biomarker concentrations were assessed before the intervention to establish a comparative baseline. Statistical analysis revealed no significant intergroup differences at baseline and one week after vitamin C supplementation.

(Table 2)

Results showed a statistically significant elevation in serum AA levels ($p < 0.05$ intra-group analysis); however, no significant disparities were observed between the groups ($p > 0.05$),

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Commented [A15]: Text sample size mismatch vs. CONSORT flowchart: Revised the sentence to clarify the number of patients randomized initially according to CONSORT guidelines (n=89) before stating the final number of subjects analyzed (n=85).

Table 3. TAC baseline serum concentrations showed no significant difference between the Vitamin C and placebo groups. Following the one-week intervention, TAC levels remained relatively lower, with intra-group analysis revealing a non-significant decline ($p > 0.05$). Similarly, Malondialdehyde (MDA) levels remained stable at both baseline and the one-week follow-up.

(Table 3)

The concentrations of AA, TAC, and MDA in the aqueous humor collected one week post-intervention demonstrated varying results between groups as detailed in Table 4, Aqueous humor AA levels showed no statistically significant disparity between the intervention and control groups. In contrast, the analysis of aqueous TAC levels revealed a significant difference between the two cohorts. Furthermore, systemic MDA concentrations within the aqueous humor demonstrated no significant variations between the treatment and control groups.

(Table 4)

Table 5 shows that aqueous MDA levels before phacoemulsification were lower in the vitamin C group than in the placebo group, although the difference was not statistically significant, a similar pattern was observed for post-phacoemulsification MDA levels.

(Table 5)

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DISCUSSION

Data had demonstrated an equal distribution across the groups, with no statistically significant differences in demographic variables observed between groups. The age distribution was consistent with the typical clinical presentation of senile cataracts. Occupational sunlight exposure, a recognized risk factor for cataract formation, did not predominate between the study group. Although a substantial proportion of participants reported no history of excessive

ultraviolet exposure, a high prevalence of dense cataracts was still observed, suggesting that advanced age was the primary contributing factor. Similar patterns were noted for smoking status, which was evenly distributed across all groups.

Visual acuity was markedly reduced across all groups, with the majority of participants meeting the criteria for blindness in one or both eyes. These findings are consistent with the severity of lens opacification observed in this cohort, as all subjects presented with cataracts graded as Grade 4 or higher, and approximately two-thirds were classified as Grade 5 or 6 according to the Lens Opacities Classification System III (LOCS III). Cataract-related blindness therefore, remains a significant public health concern within the Indonesian population.[9,10]

Plasma ascorbic acid levels increased by 636.53 ng/mL in the intervention group, which was equivalent to the control group. The increase in ascorbic acid (AA) observed in the control group may be explained by routine dietary intake, particularly seasonal consumption of fruits and vegetables. Previous studies have shown that a normal diet can produce circulating AA levels comparable to those achieved with oral supplementation. In addition, absorption of oral vitamin C is regulated by the sodium-dependent vitamin C transporter-1 (SVCT1), which operates as a saturable system. Once this transporter is fully engaged, further increases in oral supplementation do not result in higher plasma AA concentrations and excess vitamin C is readily excreted. Together, these factors likely account for the similar rise in AA levels seen in both the supplementation and placebo groups, despite differences in oral vitamin C intake.

Systemic TAC and MDA did not significantly diverge between groups. Plasma TAC slightly lower after intervention with no significant inter-group difference, with no significant intergroup difference. Plasma TAC is primarily governed by endogenous antioxidant systems; AA typically contributes less than 10% to the total systemic capacity.[11]

Serum MDA levels remained stable in both groups, suggesting that the one-week intervention was insufficient to alter markers of systemic lipid peroxidation in an aging population. In comparison, a study by Kaur et al. evaluating systemic oxidative stress in a cataract population reported significantly higher serum MDA concentrations 5.43±1.69 nmol/ml, compared to 2.42±0.46 nmol/ml in their respective control group.[12]

In contrast to MDA findings, the Vitamin C group demonstrated significantly higher aqueous TAC levels compared to the control group. Oral supplementation of 500 mg Vitamin C for seven days effectively enhanced the intraocular antioxidant capacity. TAC represents the cumulative ability of the aqueous humor to neutralize oxidative stress through the synergistic interaction of various antioxidants, rather than the concentration of a single substance.

Oral Vitamin C acts as an electron donor and a catalyst for the antioxidant network, stimulating the activity of glutathione, Vitamin E, and enzymatic antioxidants. Systemic Vitamin C supplementation has been shown to increase the expression of antioxidant genes and enzymatic activity within ocular tissues, a benefit not typically observed with local AA application. Elevated TAC levels provide a protective buffer for the corneal endothelium, which is directly exposed to free radicals generated during phacoemulsification.[6,7,13]

Analysis of aqueous AA concentrations revealed comparable median values between the treatment and control groups, suggesting that one week of oral supplementation did not significantly elevate local AA beyond physiological baseline. AA enters the aqueous humor via active transport through sodium-dependent vitamin C transporters (SVCT1 and SVCT2) and facilitated diffusion via GLUT1. While the ciliary body has high transporter expression, the entry of AA into the eye is limited by transporter saturation. Even with high-dose systemic intake,

aqueous AA levels are physiologically capped by the availability of these transporters.[6,14] High aqueous AA in the control group may reflect transient dietary intake, whereas supplementation provides more stable systemic levels that contribute to the long-term stability of the TAC.[6,7]

Previous studies suggest that intravenous administration or direct inclusion of Vitamin C in surgical irrigation fluids may be more effective than oral routes for acutely bypassing these transport limits to protect the corneal endothelium during surgery.[7]

Aqueous humor malondialdehyde (MDA), a localized byproduct of lipid peroxidation, reflects the intraocular oxidative stress environment. While ocular degenerative diseases, such as cataracts and glaucoma are typically associated with elevated MDA and depleted antioxidant levels.[15,16] However, this study found no significant difference in aqueous MDA between the Vitamin C and placebo groups. One week of oral Vitamin C supplementation appears insufficient to significantly mitigate the chronic oxidative stress present in high-density cataracts. Prolonged intervention may be necessary to achieve a measurable reduction in long-term oxidative markers.

To assess the acute impact of surgery, MDA levels were measured two minutes post-phacoemulsification, following the protocol by Liu et al. This interval accounts for the replenishment of intraocular fluids after the initial aqueous humor is replaced by irrigation during nucleus emulsification and cortex aspiration. Post-operative MDA levels were similar in both cohorts, with a marginally higher increase in the control group. This minimal difference aligns with previous findings reported by Liu et al.[17]

A major strength of this study is the direct measurement of oxidative stress biomarkers in the aqueous humor of patients with hard nuclear cataracts, a subgroup known to require higher

ultrasound energy during phacoemulsification and therefore potentially exposed to greater oxidative burden. Only few clinical studies have evaluated oxidative stress biochemical changes following phacoemulsification within the anterior chamber itself. By integrating aqueous humor total antioxidant capacity (TAC) with systemic biomarkers, this study provides mechanistic insight into the localized antioxidant response during cataract surgery. The intervention period of seven days may be considered relatively short; however, this duration was intentionally designed to reflect real-world preoperative practice, in which medications are typically administered shortly before surgery. While longer supplementation might yield additional insights into sustained antioxidant effects, the present design allows evaluation of a clinically applicable and practical preoperative strategy. Future studies with extended supplementation duration and longitudinal follow-up may further clarify the long-term impact on endothelial preservation.

In this study, short-term oral vitamin C supplementation did not significantly affect systemic or aqueous oxidative stress markers. However, it was associated with a significant increase in aqueous total antioxidant capacity. These findings indicate that while brief supplementation may not be sufficient to reduce established oxidative damage, it may enhance intraocular antioxidant defenses. Further studies with longer supplementation periods or alternative routes of administration are warranted in patients with dense senile cataracts.

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Clinical Implications and Future Directions subsection right before your final limitations

Commented [A19]: The claim that supplements effectively enhance protective status is inconsistent with the unchanged MDA data. If MDA does not decrease, then there is no real protection against the physical trauma of ultrasound.
Suggestion:
Change the narrative by stating that supplements selectively enhance localized intraocular total antioxidant capacity (TAC) but do not significantly alter systemic plasma biomarkers or reduce immediate post-phacoemulsification lipid peroxidation (MDA).

REFERENCES

1. Country Data - Indonesia [Internet]. IAPB Vision Atlas. [cited 2026 Jan 29]. Available from: https://visionatlas.iapb.org/country-data/indonesia/
2. Girsang APL WH. Statistik penduduk lanjut usia 2021 [Internet]. Jakarta: Badan Pusat Statistik; 2021 [cited 2026 Jan 29]. 3–7 p. Available from: www.bps.go.id
3. Panhwar G, Ali KFM, Ejaz A, Ali H, Latif E, Choudry MA. Oxidative stress and antioxidant Vitamin C among cataract patients: A case control study. Rawal Med J [Internet]. 2024 [cited 2026 Jan 29];49(3):587–587. Available from: https://www.rmj.org.pk/index.php?mno=170966
4. Giger-Lange C, Barz J, Heim H. How to reduce free radicals during phacoemulsification: electron paramagnetic resonance measurements comparing the production of free radicals in different use cases. J Cataract Refract Surg [Internet]. 2025;51(5):420–6. Available from: http://dx.doi.org/10.1097/j.jcrs.0000000000001625
5. Gao Y, Yang N, Wei L, Yan Y, Li L. Relationship between postoperative oxidative stress levels and corneal endothelial cell loss after phacoemulsification in diabetic patients with cataract. Clin Ophthalmol [Internet]. 2024;18:3957–65. Available from: http://dx.doi.org/10.2147/OPTH.S497133
6. Tsao YT, Wu WC, Chen KJ, Yeh LK, Hwang YS, Hsueh YJ, et al. Analysis of aqueous humor total antioxidant capacity and its correlation with corneal endothelial health. Bioeng Transl Med. 2021 May;6(2):e10199.
7. Hah YS, Chung HJ, Sontakke SB, Chung IY, Ju S, Seo SW, et al. Ascorbic acid concentrations in aqueous humor after systemic vitamin C supplementation in patients with cataract: pilot study. BMC Ophthalmol. 2017 Dec;17(1):121.
8. Widyawati S, Sitompul R, I Wanandi S, Louisa M, Kekalih A, LDR Nora R. Antioxidant support for the corneal endothelium: Evidence from vitamin C supplementation in hard

cataract phacoemulsification. F1000Res [Internet]. 2026 [cited 2026 Apr 17];14(1117):1117. Available from: https://f1000research.com/articles/14-1117/pdf

9. Lee SY, Gurnani B, Mesfin FB. Blindness. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 [cited 2025 Nov 4]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK448182/
10. Rif'Ati L, Halim A, Lestari YD, Moeloek NF, Limburg H. Blindness and Visual Impairment Situation in Indonesia Based on Rapid Assessment of Avoidable Blindness Surveys in 15 Provinces. Ophthalmic Epidemiology. 2021 Sept 3;28(5):408–19.
11. Prenesti E, Berto S, Gosmaro F, Bagnati M, Bellomo G. Biomolecules Responsible for the Total Antioxidant Capacity (TAC) of Human Plasma in Healthy and Cardiopathic Individuals: A Chemical Speciation Model. Antioxidants (Basel). 2021 Apr 23;10(5):656.
12. Kaur J, Kukreja S, Kaur A, Malhotra N, Kaur R. The oxidative stress in cataract patients. J Clin Diagn Res. 2012 Dec;6(10):1629–32.
13. Serra HM, Suárez MF. New Ultra-Structural Aspects of Cornea: Significance of Ascorbate Micronutrient Deficiency. In: Handbook of Nutrition, Diet, and the Eye [Internet]. Elsevier; 2019 [cited 2025 Nov 4]. p. 605–23. Available from: https://linkinghub.elsevier.com/retrieve/pii/B9780128152454000363
14. Ma N, Siegfried C, Kubota M, Huang J, Liu Y, Liu M, et al. Expression Profiling of Ascorbic Acid–Related Transporters in Human and Mouse Eyes. Invest Ophthalmol Vis Sci. 2016 June 28;57(7):3440.
15. Christen W. Antioxidants and age-related eye disease current and future perspectives. Annals of Epidemiology. 1996 Jan;6(1):60–6.
16. Böhm EW, Buonfiglio F, Voigt AM, Bachmann P, Safi T, Pfeiffer N, et al. Oxidative stress in the eye and its role in the pathophysiology of ocular diseases. Redox Biology. 2023 Dec;68:102967.
17. Liu YC, Setiawan M, Ang M, Yam GHF, Mehta JS. Changes in aqueous oxidative stress,

prostaglandins, and cytokines: Comparisons of low-energy femtosecond laser-assisted cataract surgery versus conventional phacoemulsification. J Cataract Refract Surg. 2019 Feb;45(2):196–203.

Table 1. Demographic and Clinical Characteristics of participants

Variable	Treatment Group (n = 45)	Control Group (n = 40)	p value	Effect size (95% CI)
Age (year)	63.69 ± 6.72	66.33 ± 7.47	0.091*	d = 0.37 (−0.06 – 0.80)
Gender				
Male	25 (55.6%)	21 (52.5%)	0.778**	φ = 0.031
Female	20 (44.4%)	19 (47.5%)		
Occupation				
Sun-exposed	22 (48.9%)	23 (57.5%)	0.427**	φ = 0.086
Non-sun exposed	23 (51.1%)	17 (42.5%)		
Smoking History				
Yes	23 (51.1%)	18 (45.0%)	0.574**	φ = 0.061
No	22 (48.9%)	22 (55.0%)		
Visual Acuity (logMAR)	2.477 (1.00)	2.48 (0.70)	0.272***	r = 0.12
Cataract Density				
NO4NC4	14 (31.1%)	19 (47.5%)	0.072**	φ = 0.249
NO5NC5	13 (28.9%)	4 (10.0%)		
NO6NC6	19 (40.0%)	17 (42.5%)		

*Independent T-test **Chi square ***Mann–Whitney test

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Table 2. Serum Levels of AA, TAC, and MDA Following One-Week Vitamin C Supplementation

Biomarker	Treatment Group (n=45)	Control Group (n=40)	*p* value	Effect Size (95% CI)
AA (ng/mL)				
Pre-Intervention	2630.72 (1958.78)	2708.26 (1894.80)	0.588*	r = 0.006
Post Supplementation	3222.83 (1650.29)	3356.41 (1655.01)	0.947*	r = 0.00078
Mean Difference	636.53 (1215.19)	697.85 (1482.9)	0.647*	r = 0.005
TAC (µM)				
Pre-Intervention	95 (85.33)	97.27 (127.00)	0.476*	r = 0.0083
Post Supplementation	83.30 (64.70)	72.60 (65.73)	0.937*	r = 0.0009
Mean Difference	-19.09 (67.71)	-17.67 (94.69)	0.755*	r = 0.0037
MDA (nMol/mL)				
Pre-Intervention	0.92 ± 0.31	0.83 ± 0.24	0.131**	0.327 *** (-0.103 – 0.7550)
Post Supplementation	0.80 (0.24)	0.81 (0.31)	0.735*	r = 0.0039
Mean Difference	-0.041 ± 0.60	-0.05 ± 0.45	0.594**	-0.114 *** (-0.540 – 0.312)

*Mann–Whitney test **Independent T-test ***Cohen's D

Commented [A21]: Explain the meaning of the r symbol in the effect size column

Commented [A22]: •In Table 2, the Mean Difference for Plasma TAC is listed as negative (-19.09 for treatment, -17.67 for control), indicating that total antioxidant capacity dropped after taking Vitamin C.
•However, in Table 3, the text shows a negative mean difference (-7.5 and -17.66), but the raw means seem to show an increase or completely different distribution. Furthermore, the text in the results section states following the one-week intervention, TAC levels remained relatively lower.

Verify why systemic TAC dropped after Vitamin C loading. If it is an artifact of your baseline median differences, make sure Table 2 and Table 3 agree mathematically.

Commented [A23]: Please chack The effect size or Cohen's value

Table 3. Comparison of serum AA, TAC and MDA Pre-intervention and One-Week after Vitamin C Supplementation

Group	Pre-intervention	Post-intervention	Mean Difference	*p* value	Effect Size (95% CI)
AA (ng/mL)					
Treatment Group (n=45)	2878.52 ± 1871.32	3584.93 ± 1288.32	706.40 ± 1152.03	**< 0.001***	**-0.512 (-0.821- -0.199)** ***
Control Group (n=40)	2993.21 ± 1188.00	3459.53 ± 1253.84	526.32 ± 1277.12	**0.003***	**-0.412 (-0.733 - -0.087)** ***
TAC (µM)					
Treatment Group (n=45)	68.17 (120.89)	80.60 (95.56)	-7.5 (74.57)	0.615**	r = 0.016
Control Group (n=40)	97.27 (127)	72.6 (65.23)	-17.66 (94.69)	0.078**	r = 0.021
MDA (nMol/mL)					
Treatment Group (n=45)	0.93 ± 0.26	0.87 ± 0.19	-0.07 ± 0.33	0.076*	0.88 (-0.205 – 0.381) ***
Control Group (n=40)	0.83 ± 0.24	0.84 ± 0.31	0.006 ± 0.45	0.174*	0.018 (-0.327 - 0.292) ***

*Dependent T-test **Wilcoxon Test ***Cohen's D

Commented [A24]: Why do you use Cohen'sD and r?

Commented [A25]: There is duplication and contradiction of information. Combine Tables 2 and 3 into a single table (Plasma Biomarkers). Give the table a descriptive title and create clear columns for Pre, Post, Delta (Difference) values, p-values for intra-group comparisons (before vs. after), and p-values for inter-group comparisons (treatment vs. placebo).

Table 4. Aqueous levels of AA, TAC and MDA Following One-Week Vitamin C Supplementation

Biomarker	Treatment Group (n=45)	Control Group (n=40)	*p* value	Effect size (95% CI)
AA (ng/mL)	512.60 (544.64)	592.69 (662.08)	0.250*	r = 0.12
TAC (umol/L)	**1310.45 (645.03)**	**944.31 (545.35)**	**<0.001***	**r = 0.62**
MDA (ng/mL)	16.61 ± 9.03	17.32 ± 8.68	0.715**	d = 0.08 (−0.35 – 0.51)

*Mann–Whitney test **Independent T-test

Commented [A26]: Combine Tables 4 and 5 (Aquous Humor Biomarkers).

Commented [A27]: What is the meaning of r and d?

Table 5. MDA level in aqueous humor

MDA level in Aqueous Humor	Treatment Group (n=45)	Control Group (n=40)	*p* value	Effect size (95% CI)
Pre Phacoemulsification (ng/mL)	16.61 ± 9.03	17.32 ± 8.68	0.715*	d = 0.08 (−0.35 – 0.51)
Post Phacoemulsification (ng/mL)	21.39 (16.77)	21.47 (12.27)	0.725**	r = 0.04

**Independent T-test **Mann–Whitney Test

Commented [A28]: Why do you use r?

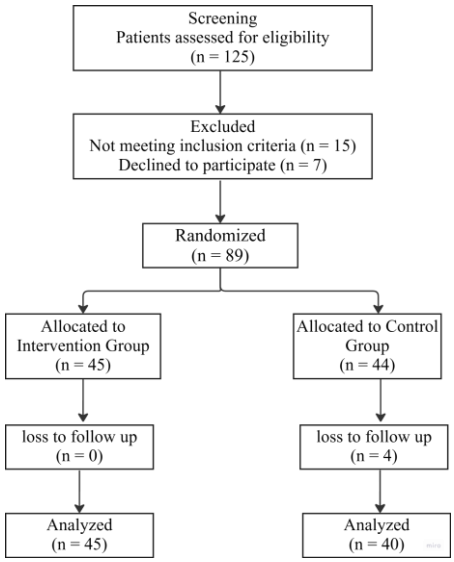

Figure 1. CONSORT Flow Diagram of the Study

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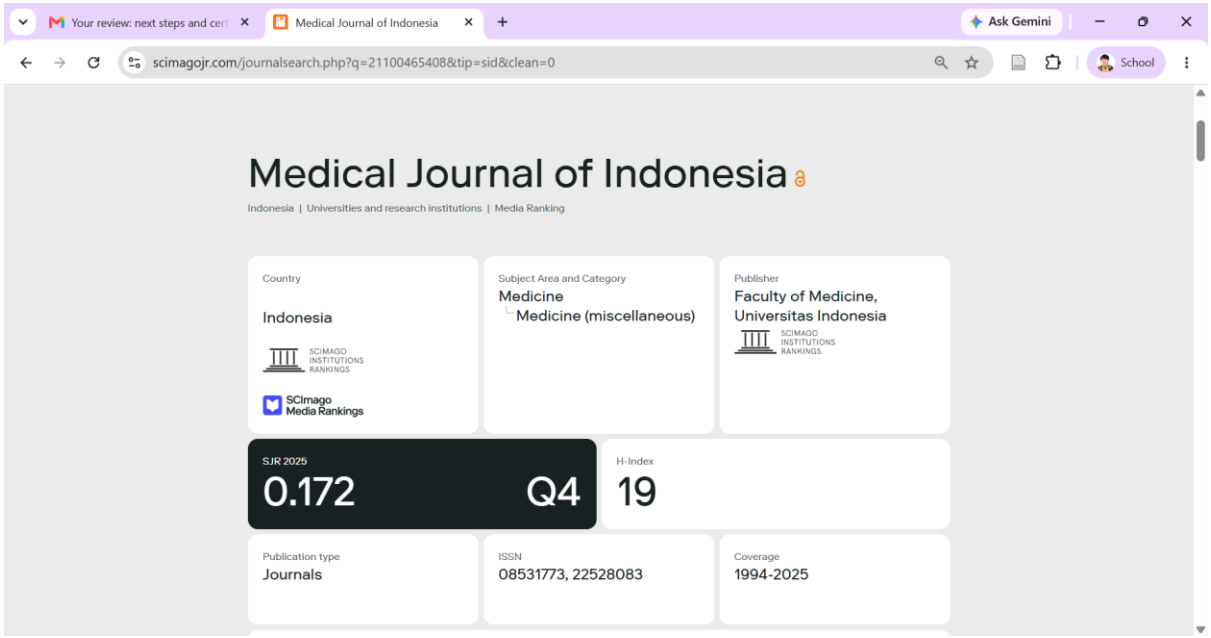
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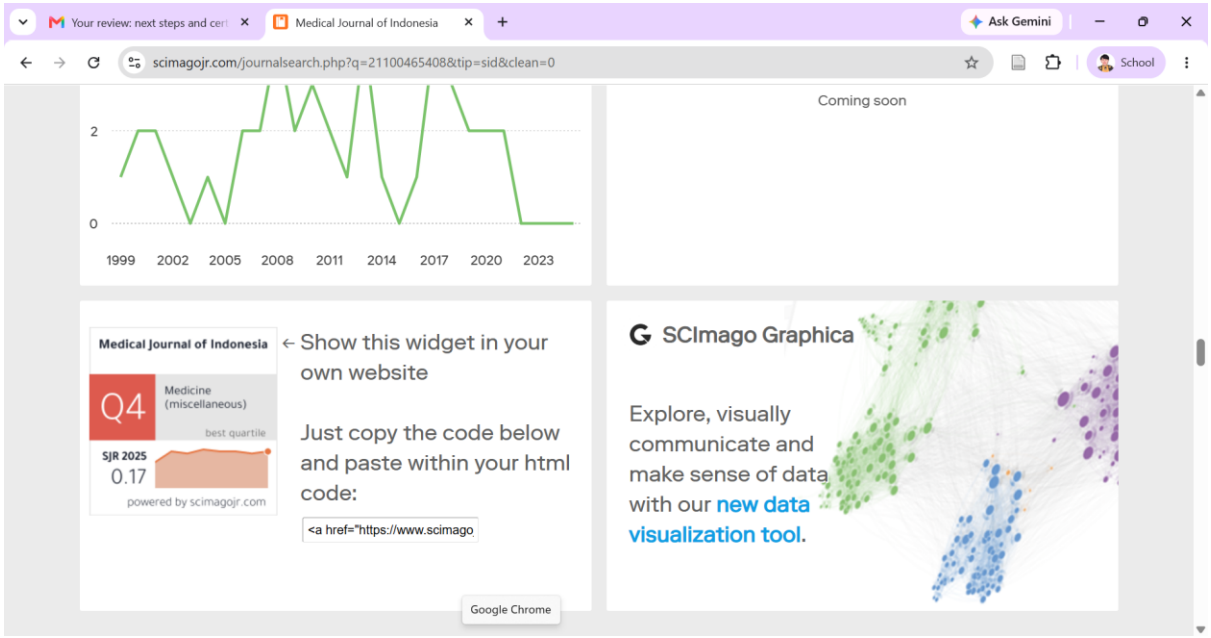
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