

**USING OZONOTHERAPY ON THE TREATMENT OF EYE DISEASES
(LITERATURE REVIEW)**

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Abstract. Ozonotherapy is gaining attention in ophthalmology as a potential treatment for various eye conditions due to its anti-inflammatory, bactericidal, and circulatory benefits. Early uses in veterinary medicine show promise, particularly for anterior segment diseases, suggesting ozone could help reduce inflammation and infections in the eye. Studies and reviews have explored ozone therapy's application for eye diseases, noting different methods for administration, such as topical use and systemic delivery. Evidence suggests it may be effective for age-related macular degeneration (AMD), with some studies indicating improvements in visual acuity. Ozone therapy is also examined for other inflammatory conditions and wound healing, but has possible side effects, like burning eyes. While ozone can be beneficial, environmental exposure can worsen dry eye symptoms. Stabilized ozonated oils may offer a safer application for treatment. More extensive clinical trials are needed to establish standardized protocols and ensure safe usage.

Key words: Ozonotherapy, dry eye syndrome, anterior segment, age-related macular dystrophy.

Introduction

Ozonotherapy has garnered increasing interest within ophthalmology as a potential adjunct or alternative treatment modality for various eye conditions. The therapeutic application of ozone, primarily due to its anti-inflammatory, bactericidal, and circulatory-enhancing properties, has been explored across multiple studies and clinical reports, highlighting both its potential benefits and associated risks.

One of the earliest documented uses of ozone in ocular treatment is its application in anterior segment pathologies, particularly in veterinary medicine. According to [1], ozone-based eye drops have been employed in cases involving anterior segment diseases, with promising outcomes attributed to ozone's anti-inflammatory and bactericidal activities. This suggests that ozone could serve as a topical agent to mitigate inflammation and combat infections in the eye, which are common features in many ocular diseases.

Further elaborating on the therapeutic scope, [2] provides a comprehensive overview of ozone therapy in ophthalmology, listing various eye diseases and the recommended methods for local ozone application. The review emphasizes that ozone therapy can be administered through different routes, including topical application, insufflation,

and systemic administration, tailored to specific conditions. The authors underscore the importance of proper dosing and application techniques to maximize benefits and minimize adverse effects.

Clinical evidence supporting the efficacy of ozonotherapy in ocular conditions is presented in studies focusing on age-related degenerative diseases. Notably, [3] reports on two small clinical studies involving 217 patients with dry age-related macular degeneration (AMD). The findings suggest that ozonotherapy may halt disease progression and improve visual acuity, indicating a potential role for ozone in managing degenerative retinal conditions. These results are particularly significant given the limited treatment options available for AMD, especially in its early stages.

In addition to degenerative diseases, ozone therapy has been explored for its anti-inflammatory effects in other ocular conditions. [4] discusses the broader context of ozone therapy, noting its potential to heal wounds and treat various diseases, including ocular inflammations. However, the authors also caution about possible side effects, such as burning eyes and coughing, which are associated with ozone exposure. This highlights the need for careful administration and monitoring during therapy.

Holistic approaches to eye care, incorporating ozone therapy, are also documented. [5,6] Describes how ozone therapy can be integrated into treatment plans for dry eye syndrome and inflammatory conditions, emphasizing its role in reducing inflammation and supporting tissue healing. The authors advocate for ozone as part of a comprehensive, patient-centered approach, although they acknowledge that more extensive clinical trials are necessary to establish standardized protocols.

The impact of environmental ozone exposure on ocular health is addressed in [7], which reports that ambient ozone, a common air pollutant, can exacerbate dry eye symptoms. This underscores a paradox where ozone, beneficial when used therapeutically, can be harmful in environmental contexts, contributing to ocular surface damage and inflammation. Such findings highlight the importance of controlled ozone application in clinical settings.

The anti-inflammatory properties of ozone are further supported by studies on stabilized ozone derivatives. [8] describes the use of ozonated oils, which can be effectively stabilized for topical use. These formulations have shown promise in reducing ocular surface inflammation, offering a safer and more manageable means of delivering ozone's therapeutic effects. This approach could mitigate some of the risks associated with gaseous ozone exposure.

Emerging evidence also points to the potential of ozone therapy in treating degenerative retinal diseases such as macular degeneration. [9] Presents a recent study from Cuba indicating that ozone therapy may reverse some effects of macular degeneration, a leading cause of vision loss in the elderly. Similarly, [10] discusses observations of ozone therapy applied to dystrophic maculopathy, suggesting that alterations in ocular tissue health may be modifiable through ozone treatment. These findings are preliminary but suggest a promising avenue for future research into degenerative retinal conditions.

Despite these encouraging reports, caution is warranted. [7] emphasizes that ozone, particularly in environmental exposure, can worsen dry eye symptoms and cause ocular irritation. This duality underscores the importance of controlled, therapeutic use of ozone, as opposed to uncontrolled environmental exposure, which can be detrimental.

Conclusion.

In summary, the current body of literature indicates that ozonotherapy holds potential as a multifaceted treatment modality in ophthalmology. Its anti-inflammatory, antimicrobial, and circulatory benefits could be harnessed to manage a variety of eye diseases, including dry eye syndrome, inflammatory conditions, and degenerative diseases such as age-related macular degeneration (AMD) and maculopathy. Nonetheless, the evidence remains preliminary, and further rigorous clinical trials are necessary to establish standardized treatment protocols, optimal dosing, and safety profiles. The dual nature of ozone—therapeutic when properly administered and harmful when exposure is uncontrolled—necessitates careful application and ongoing research to elucidate its role in eye disease management fully.

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