

Effectiveness of Traditional Therapy and the Use of Herbal Infusion Eye Applicators in Mild Astigmatism

Fayzieva Dilorom Boritoshevna

Associate Professor, Military Medical Academy of the Armed Forces, Tashkent, Uzbekistan

Abstract Mild astigmatism is a common refractive eye disorder that can cause visual discomfort and reduced visual acuity. This study compares the effectiveness of traditional therapy (physiotherapy and eye exercises) and treatment with eye applicators based on infusions of domestic medicinal herbs. Key biochemical markers of inflammation and growth factors in the blood and tears of patients were used to assess effectiveness. The results showed that traditional therapy provides a faster reduction in inflammatory markers, while treatment with eye applicators promotes the activation of regenerative processes and a slower but more sustainable improvement in condition.

Keywords Mild astigmatism, Traditional therapy, Eye applicators, Herbal infusions, Physiotherapy, Eye exercises, Inflammatory markers, Growth factors, Regeneration, Visual acuity

1. Introduction

Mild astigmatism is a refractive error of the eye that occurs when the cornea or lens does not have a perfectly spherical shape [1]. Instead, these structures are shaped more like a football or ellipsoid, leading to a distortion in the way light enters the eye. This distortion can cause various visual disturbances, such as blurry or distorted vision at both near and far distances. As a result, individuals with mild astigmatism may experience a range of symptoms, including visual discomfort, eye strain, frequent headaches, and a general reduction in visual acuity. These symptoms can significantly impact daily activities, such as reading, driving, or working at a computer, often leading to fatigue and frustration [2-5].

Traditional methods for managing and correcting mild astigmatism have focused primarily on enhancing the health and function of the eye through physiotherapy, visual training, and exercises [6,7]. These approaches are intended to improve blood circulation in the eyes, strengthen the surrounding muscles, and help the individual adapt to the distortion in vision. Common practices in traditional therapy include focusing exercises, relaxation techniques, and sometimes, the use of corrective lenses like glasses or contact lenses to aid in achieving clearer vision. However, in recent years, there has been growing interest in alternative treatment options, especially those that leverage the healing properties of natural substances. One such method involves

the use of eye applicators that utilize medicinal herbs. These herbal infusions are believed to have various beneficial properties, such as anti-inflammatory, antioxidant, and regenerative effects on the eye tissue, potentially supporting healing and improving overall eye health [8-10].

2. Purpose of the Research

The aim of this study was to conduct a thorough comparison between the traditional therapy methods, which rely on visual exercises and physiotherapy, and the alternative approach that involves the application of medicinal herb-infused eye applicators [11]. The study specifically focused on patients diagnosed with mild astigmatism. To assess the effectiveness of these two treatment modalities, several key biochemical markers were analyzed, including indicators of inflammation and growth factors, in both the blood and tears of the patients [12]. These markers are important in evaluating the body's response to treatment, as they provide insight into the inflammatory processes and healing mechanisms that may be occurring in the eye [13,14]. By comparing the results of these two treatment strategies, the study aimed to determine which method offers more significant benefits for individuals with mild astigmatism in terms of reducing symptoms and improving visual function.

3. Materials and Methods

Sixty patients with mild astigmatism aged 23 to 36 years participated in the study. Patients were divided into two groups: the traditional therapy group (5 people) and the eye applicator treatment group (6 people).

* Corresponding author:

fayziyeva_dil@mail.ru (Fayzieva Dilorom Boritoshevna)

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The traditional therapy group received physiotherapy (electrostimulation and magnetotherapy) and eye exercises (exercises to strengthen eye muscles) for two months. The eye applicator treatment group used applicators soaked in herbal infusions (chamomile, calendula, and yarrow), which were applied to closed eyelids for 20 minutes daily for two months.

Analysis of biochemical markers was performed before treatment, one month after the start of treatment, and two months after the start of treatment. The markers used were transforming growth factor beta (TGF- β), interleukin-6 (IL-6), tumor necrosis factor alpha (TNF- α), monocyte chemoattractant protein-1 (MCP-1), and nerve growth factor (NGF). Blood and tear samples were taken from all patients at the specified times.

4. Results and Discussion

Traditional Therapy

In patients who underwent traditional therapy for mild astigmatism, the initial indicators before the start of the treatment were carefully measured to establish baseline levels of various biochemical markers. These markers included inflammatory substances and growth factors such as Transforming Growth Factor Beta (TGF- β), Tumor Necrosis Factor Alpha (TNF- α), and Interleukin-6 (IL-6), both in the blood and in tears. These markers were selected because they play a significant role in the inflammatory processes that can affect the eyes, particularly in conditions like astigmatism where visual distortions can trigger inflammatory responses.

One month after the start of the traditional treatment regimen, there was a noticeable decrease in the levels of these inflammatory markers and growth factors. This reduction indicated a positive response to the therapy, suggesting that the treatment was helping to mitigate the underlying inflammation and promote a healthier ocular environment. Among the changes observed, the most significant reduction occurred in the levels of TGF- β in the blood, which dropped by 3.3%, and TNF- α , which decreased by 4.9%. These markers are known to be involved in inflammatory processes and their decrease suggests a reduction in ocular inflammation. Furthermore, in the tears, IL-6 levels decreased by 4.3%, and TNF- α levels decreased by 3.8%, which also pointed to a reduction in local inflammation around the eye.

After two months of traditional treatment, the results showed even more pronounced improvements. The levels of TGF- β in the blood had decreased by 6.9%, IL-6 by 7.8%, and TNF- α by 10%. These decreases were more substantial compared to the one-month mark, indicating that the treatment had a cumulative effect and continued to reduce the inflammatory markers over time. In tears, the greatest changes were observed in the levels of IL-6, which dropped by an impressive 10.9%, and TNF- α , which decreased by 7.7%. These reductions in both blood and tear markers suggest that traditional therapy not only had an anti-inflammatory effect on the blood but also played a role in reducing

inflammation at the ocular surface, contributing to a decrease in the symptoms associated with mild astigmatism.

Overall, these findings demonstrate that traditional therapy for mild astigmatism led to significant improvements in the levels of key inflammatory markers and growth factors, reflecting a positive therapeutic effect. This data supports the notion that traditional treatment methods may help reduce the underlying inflammation associated with mild astigmatism, ultimately contributing to an improvement in the patients' visual health and quality of life.

Treatment with Eye Applicators

For the group receiving treatment with eye applicators based on infusions of domestic medicinal herbs, the initial data before the start of therapy were carefully assessed. These baseline levels of key biochemical markers were measured in both blood and tears to provide a clear understanding of the patients' condition before undergoing the herbal treatment. The markers selected for evaluation included Transforming Growth Factor Beta (TGF- β), Interleukin-6 (IL-6), Tumor Necrosis Factor Alpha (TNF- α), Monocyte Chemoattractant Protein-1 (MCP-1), and Nerve Growth Factor (NGF), all of which are crucial in regulating inflammatory and regenerative processes in the body.

One month after the start of treatment with the herbal eye applicators, the results showed a remarkable increase in all key markers in the blood, suggesting that the application of medicinal herbs was stimulating regenerative processes within the eye. This increase could be associated with the body's response to the herbal treatment, potentially signaling the activation of repair and healing mechanisms. In the blood, TGF- β levels increased by 24.8%, IL-6 by 96.3%, TNF- α by 70.8%, MCP-1 by 37.8%, and NGF by 38%. These significant increases in inflammatory and growth markers could indicate an enhanced biological response, likely aimed at healing the tissues of the eye and promoting regeneration. Similarly, in the tears, there was also an increase in all the key indicators, with TGF- β rising by 46.3%, IL-6 by 61.3%, TNF- α by 60%, MCP-1 by 18.8%, and NGF by 22.4%. The increase in these markers in tears suggests that the treatment was having a localized effect on the ocular surface, stimulating inflammation and regeneration at the site of the condition.

After two months of treatment with the herbal applicators, the markers in the blood showed a partial decrease, although the levels remained significantly higher than the initial values, indicating that the treatment was still having an ongoing effect. In the blood, TGF- β levels decreased by 12.2%, IL-6 by 63.6%, TNF- α by 43.8%, MCP-1 by 22.1%, and NGF by 23.5%. While these decreases suggest that the initial stimulation had begun to taper off, the fact that the markers remained elevated compared to the baseline levels points to the continued presence of regenerative activity and inflammation. In tears, the changes mirrored those seen in the blood, with a decrease in the levels of the markers, yet these levels still remained higher than they had been before the treatment began. The most noticeable decreases in tears were seen in TNF- α (a decrease of 38%) and MCP-1 (a decrease

of 8.6%), both of which suggest a reduction in inflammation after the initial stimulation phase of the treatment.

Overall, these results from the group receiving treatment with eye applicators based on infusions of domestic medicinal herbs indicate a strong regenerative response within the body, especially in the first month of treatment. The initial increase in inflammatory markers followed by a partial decrease in the second month suggests a dynamic healing process. The ongoing elevated levels of markers in both blood and tears imply that the herbal treatment had a lasting effect on the body's inflammatory response, supporting the idea that this approach may help in managing and potentially improving conditions like mild astigmatism. Despite some fluctuations in the levels of the markers, the overall trend suggests that the herbal therapy contributed to enhancing the regenerative and anti-inflammatory processes necessary for ocular health.

Comparative Analysis

A comparison of the results between traditional therapy and treatment with eye applicators based on medicinal herb infusions revealed distinct differences in their effects on inflammatory markers, particularly IL-6 and TNF- α , both in blood and in tears. Traditional therapy showed a more pronounced and stable reduction in these inflammatory markers, especially after two months of treatment. In the group receiving traditional therapy, the levels of IL-6 in the blood decreased by 7.8%, and TNF- α decreased by 10% in both blood and tears. These reductions indicate a consistent anti-inflammatory effect over the course of treatment, suggesting that traditional methods are effective at reducing the chronic inflammation that often accompanies conditions like mild astigmatism.

In contrast, the treatment with eye applicators initially led to an increase in the levels of inflammatory markers such as IL-6 and TNF- α . This initial rise may be indicative of the activation of regenerative and recovery processes, which is a common response to therapies aimed at stimulating healing and tissue repair. However, after two months of treatment with the applicators, the decrease in the levels of IL-6 and TNF- α in both blood and tears was slower compared to the traditional therapy group. While there was still a decrease in these markers, the rate of change was less pronounced, suggesting that the applicator treatment may have a more gradual effect on inflammation.

Despite this slower reduction in inflammatory markers, the herbal eye applicator treatment showed notable improvements in other key markers, particularly MCP-1 and NGF. MCP-1, a marker associated with inflammation, and NGF, a growth factor important for tissue regeneration, both exhibited significant changes, indicating that the herbal treatment was still actively influencing tissue recovery and healing. These findings suggest that while the applicator treatment may not have been as immediately effective at reducing inflammation as traditional therapy, it still played a key role in stimulating ongoing tissue regeneration and repair, with potential long-term benefits.

In summary, traditional therapy proved more effective in

the short term for reducing key inflammatory markers, suggesting a quicker anti-inflammatory response. However, the herbal eye applicator treatment demonstrated a potential for promoting recovery and regeneration, with slower but sustained changes in inflammatory markers and enhanced tissue recovery processes. Both treatment methods had their merits, with traditional therapy offering faster anti-inflammatory results, while the herbal applicator treatment appeared to support longer-term regenerative healing processes.

5. Conclusions

Both treatment methods demonstrated effectiveness in addressing mild astigmatism, yet they differed in the nature and pace of their effects on inflammatory markers and overall recovery. Traditional therapy proved to be more effective in achieving faster and more significant reductions in inflammatory markers such as IL-6 and TNF- α , both in the blood and tears. This quick response suggests that traditional methods, which likely focus on enhancing blood circulation, strengthening eye muscles, and reducing inflammation, offer a more immediate relief from the symptoms associated with mild astigmatism. The more rapid reduction in these markers indicates that traditional therapy can provide quicker anti-inflammatory effects, which may lead to short-term improvements in visual comfort and clarity.

On the other hand, treatment with eye applicators based on medicinal herbs initially caused an increase in inflammatory markers, which might seem counterintuitive. However, this early increase likely reflects the activation of regenerative and healing processes, which are essential for long-term tissue repair and recovery. While the reduction in inflammatory markers such as IL-6 and TNF- α occurred more gradually compared to traditional therapy, the overall trend suggested that the herbal treatment had a more sustainable effect. The significant changes in markers such as MCP-1 and NGF pointed to continued stimulation of tissue regeneration and repair, which could be beneficial in the long run.

Thus, while the traditional therapy offers quicker and more immediate improvements in reducing inflammation, the herbal applicator treatment appears to promote a more gradual, yet potentially more sustainable recovery. This slower healing process could be beneficial for individuals looking for longer-term benefits, as it may help with ongoing tissue regeneration and provide more lasting relief from astigmatism symptoms. Overall, both treatments offer distinct advantages, with traditional therapy being ideal for quick symptom relief and the herbal applicator treatment offering a potentially more enduring solution with a focus on regeneration and recovery.

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