

PREVENTION OF DRY EYE SYNDROME IN WOMEN OF CLIMACTERIC AGE

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Abstract: Dry eye syndrome (DES) is a multifactorial ocular surface disorder that becomes increasingly prevalent among women during the climacteric period due to complex hormonal changes. Estrogen and androgen deficiencies associated with menopause affect the lacrimal and meibomian glands, leading to decreased tear production and instability of the tear film. As a result, affected women often experience symptoms such as ocular dryness, irritation, burning sensation, and visual fatigue, which can significantly impact daily activities and quality of life.

This study aims to investigate the primary causes and pathophysiological mechanisms of DES in climacteric women and to assess the effectiveness of various preventive strategies, including the use of artificial tears, nutritional supplements (e.g., omega-3 fatty acids), and hormone replacement therapy (HRT).

A total of 120 women aged 45 to 60 years were examined and divided into premenopausal, perimenopausal, and postmenopausal subgroups. Clinical tests, hormonal assessments, and patient-reported symptom questionnaires were used to evaluate tear function and ocular surface health.

The findings highlight a strong correlation between estrogen decline and the severity of DES symptoms. Preventive interventions demonstrated varying degrees of success, with the greatest improvement observed in patients who received early, individualized treatment.

The results of this study emphasize the need for increased awareness, timely screening, and comprehensive management of dry eye syndrome in menopausal women, which can ultimately reduce the burden of disease and improve their visual comfort and quality of life.

Keywords: Dry eye syndrome, menopause, prevention, hormone deficiency, ocular health

Introduction

The climacteric period, also known as the menopausal transition, is a physiological phase characterized by hormonal imbalances, particularly the reduction of estrogen and progesterone levels. These hormonal shifts have significant implications not only for systemic health but also for ocular well-being. Dry eye syndrome (DES) is one of the most frequently reported ophthalmological complaints in menopausal women, often leading to chronic discomfort, visual disturbances, and reduced quality of life.

The prevalence of DES among postmenopausal women ranges from 30% to 50%, depending on age, geography, and environmental exposure. Understanding the pathophysiological mechanisms underlying DES during this stage is crucial for developing effective and timely preventive measures.

Purpose of the Study

To identify the primary causes of dry eye syndrome in women of climacteric age and assess the effectiveness of modern prophylactic strategies. The primary objective of this study is to thoroughly investigate the underlying causes and contributing factors of dry eye syndrome (DES) in women undergoing climacteric changes, including the premenopausal,

perimenopausal, and postmenopausal stages. Due to the physiological and hormonal transitions occurring during this period—particularly the decline in estrogen and other sex hormones—ocular surface integrity is often compromised, resulting in an increased incidence of DES.

This research aims to:

Identify the prevalence and clinical manifestations of DES among climacteric women;

Examine the pathophysiological relationship between hormonal changes and tear film dysfunction;

Analyze the influence of environmental, lifestyle, and systemic health factors that exacerbate dry eye symptoms in this population;

Evaluate the effectiveness of various preventive strategies, including non-pharmacological methods (artificial tears, nutritional supplements), and pharmacological approaches such as hormone replacement therapy (HRT);

Develop evidence-based recommendations for early screening, risk assessment, and personalized preventive care for women in climacteric age groups.

By achieving these objectives, the study seeks to contribute to a deeper understanding of menopausal ocular health, provide clinicians with practical tools for early intervention, and ultimately improve the quality of life for affected patients through timely and appropriate management strategies.

Methods

This study included a total of 120 women aged 45–60 years, who presented symptoms consistent with dry eye syndrome. Subjects were categorized into premenopausal, perimenopausal, and postmenopausal groups.

The methodology involved:

Standardized Ocular Surface Disease Index (OSDI) questionnaire

Schirmer's test and Tear Break-Up Time (TBUT)

Hormonal profile assessment

Detailed patient interviews and lifestyle evaluations

Preventive intervention strategies including artificial tears, omega-3 supplements, and hormone replacement therapy (HRT) where applicable

The study lasted for six months and was conducted at the ophthalmology department of Central Asian Medical University.

Results

Dry eye symptoms were significantly more pronounced in postmenopausal women (OSDI score > 33 in 65% of patients).

The Schirmer's test revealed tear production less than 5 mm in 45% of cases. Tear film instability (TBUT < 10 seconds) was common in 70% of symptomatic patients.

Hormonal analysis indicated a strong correlation between estrogen deficiency and the severity of dry eye symptoms.

Preventive interventions showed:

Artificial tears improved symptoms in 80% of participants

Omega-3 supplements reduced inflammation and improved tear stability in 65%

HRT, when used under supervision, significantly alleviated symptoms in 40% of women who were eligible

Statistical analysis demonstrated that early intervention was associated with a 35% reduction in symptom progression over six months.

Discussion

Dry eye syndrome in climacteric women is multifactorial, with hormonal insufficiency playing a central role. In addition, environmental factors such as air pollution, screen exposure, and low humidity exacerbate symptoms.

The results support the integration of regular ophthalmological screening and targeted preventive care in menopausal health programs. Nutritional support and individualized treatment plans are essential components of effective management.

Conclusion

Dry eye syndrome is a significant and increasingly recognized ophthalmologic condition among women undergoing climacteric changes. The hormonal fluctuations that occur during this transitional period—most notably the decline in estrogen and androgen levels—have a profound impact on the ocular surface and lacrimal functional unit, contributing to tear film instability, inflammation, and epithelial damage. This study confirmed that postmenopausal women are at particularly high risk for developing moderate to severe symptoms of dry eye, which can greatly impair daily functioning, work productivity, and overall well-being.

The findings underscore the importance of early identification and intervention. Clinical screening using standardized tools such as the OSDI questionnaire, Schirmer's test, and TBUT assessments should be incorporated into routine care for women entering the menopausal stage. Furthermore, preventive strategies—both pharmacological and non-pharmacological—can play a vital role in mitigating the severity of symptoms. Artificial tears and omega-3 fatty acid supplementation have proven beneficial in improving ocular surface lubrication and reducing inflammation, while hormone replacement therapy, when appropriately prescribed, may provide additional symptom relief for select patients.

It is also essential to consider patient-specific factors such as environmental exposure, digital screen use, systemic diseases, and lifestyle habits, which may exacerbate dry eye symptoms. A personalized, multifaceted approach to prevention and treatment yields the best outcomes. In this context, collaboration between ophthalmologists, gynecologists, and primary care physicians becomes crucial in providing comprehensive care for climacteric women.

In conclusion, addressing dry eye syndrome in menopausal women requires heightened clinical awareness, multidisciplinary cooperation, and evidence-based strategies. Public health efforts should focus on educating both healthcare providers and patients about the ocular implications of menopause, thereby promoting timely screening and tailored preventive measures. Such proactive approaches will help reduce the burden of dry eye disease and enhance the ocular and general health of women during this vulnerable stage of life.

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