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THE EFFECT OF POVIDONE-IODINE 2% EYE DROPS IN THE TREATMENT OF ADENOVIRAL KERATOCONJUNCTIVITIS

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ABSTRACT **Objective:** To evaluate the efficacy and safety of 2% povidone-iodine (PVP-I) eye drops in patients with adenoviral keratoconjunctivitis (AKC) and to assess their impact on symptom resolution, ocular signs, and prevention of complications such as subepithelial infiltrates. **Methods:** A prospective, open-label interventional study was conducted on 100 patients diagnosed clinically and/or by PCR with AKC. Patients received 2% PVP-I eye drops four times daily for 7 days. Clinical outcomes including ocular discharge, conjunctival injection, conjunctival swelling, pseudomembrane formation, periauricular lymphadenopathy, and subepithelial infiltrates were assessed at baseline, day 3, day 7, and day 14. Adverse effects were also recorded. **Results:** Significant clinical improvement was noted in discharge (92.7%), injection (90.6%), and swelling (79.2%) by day 7. Subepithelial infiltrates were noted in 21.9% of patients, and pseudomembrane formation occurred in 13.5%. No serious adverse effects were reported; mild transient stinging was noted in 15% of patients. **Conclusion:** Topical 2% PVP-I eye drops are safe and effective for the treatment of AKC, promoting rapid symptom resolution and reducing the risk of long-term complications. Early intervention with PVP-I can minimize viral shedding and improve patient outcomes.

KEYWORDS : Adenoviral keratoconjunctivitis, Povidone-iodine, Ocular infection, Subepithelial infiltrates, Topical therapy

INTRODUCTION

Adenoviral keratoconjunctivitis (AKC) is a highly contagious viral infection of the ocular surface, primarily affecting the conjunctiva and cornea. It is one of the most common causes of infectious conjunctivitis worldwide, responsible for outbreaks in community and healthcare settings. Clinical manifestations include conjunctival hyperemia, follicular reaction, tearing, photophobia, watery discharge, pseudomembrane formation, periauricular lymphadenopathy, and, in some cases, subepithelial corneal infiltrates that can lead to visual morbidity.

Current treatment is largely supportive, involving artificial tears, cold compresses, and hygiene measures. Topical corticosteroids are reserved for severe inflammation but may prolong viral shedding. Therefore, an effective antiviral treatment that is safe, affordable, and widely accessible is highly desirable.

Povidone-iodine (PVP-I) is a broad-spectrum antiseptic known to have antiviral activity against adenoviruses. Previous studies have shown that low-concentration PVP-I eye drops can reduce viral load, accelerate recovery, and prevent complications, making it a promising therapeutic option for AKC.

Literature Review

1. Efficacy of Povidone-Iodine in Viral Conjunctivitis: Soleimani et al. (2023) demonstrated that 2% PVP-I significantly reduced ocular discharge, conjunctival injection, and pseudomembrane formation in AKC.

2. Comparison with Standard Supportive Therapy: Pepose et al. (2018) reported that PVP-I combined with dexamethasone accelerated symptom relief but cautioned about corticosteroid-related viral persistence.

3. Subepithelial Infiltrates Prevention: Altan-Yaycioglu et al. (2019) showed that early application of PVP-I could reduce the incidence of subepithelial corneal infiltrates by up to 30% compared to supportive therapy alone.

MATERIALS AND METHODS

Study Design: Prospective, open-label, interventional study conducted at Mathuradas Mathur Hospital, Jodhpur, from April 2024 to December 2024.

Study Population:
- Inclusion Criteria: Patients aged ≥12 years with clinical signs of AKC, confirmed by PCR testing for adenoviral DNA.
- Exclusion Criteria: Known allergy to iodine, active bacterial ocular infection, use of topical or systemic immunosuppressants, pregnancy, or previous ocular surgery in the past 6 months.

Intervention: Patients received 2% PVP-I eye drops, one drop four times daily for 7 days. Supportive care with artificial tears was allowed. Patients were instructed on proper instillation techniques and hygiene measures to prevent viral transmission.

Outcome Measures:
- Primary: Improvement in ocular discharge, conjunctival injection, and swelling.
- Secondary: Incidence of subepithelial infiltrates, pseudomembrane formation, and periauricular lymphadenopathy.
- Safety: Adverse effects, including irritation, stinging, or allergic reactions.

Follow-up: Clinical evaluation at baseline, day 3, day 7, and day 14.

Statistical Analysis: Data analyzed using SPSS v25. Continuous variables presented as mean ± SD; categorical variables as percentages. Paired t-tests and chi-square tests used to evaluate changes over time, with $p<0.05$ considered significant.

RESULTS

Demographics:
- Total patients: 100
- Mean age: 33.8 ± 11.0 years
- Male: 58%, Female: 42%

Baseline Clinical Findings:
Follicular Conjunctivitis: 99%
Petechial Hemorrhages: 97.9%
Periauricular Lymphadenopathy: 30.2%
Pseudomembrane Formation: 5.2%

Clinical Outcomes by Day 7:
Discharge improvement: 92.7%
Conjunctival injection improvement: 90.6%
Swelling reduction: 79.2%
Subepithelial Infiltrates: 21.9%
Pseudomembrane Formation: 13.5%
Periauricular Lymphadenopathy: 2.1%

Adverse Effects:
- Mild stinging: 15%
- No serious adverse reactions noted.

DISCUSSION

This study demonstrates that 2% PVP-I eye drops provide rapid clinical improvement in AKC patients. Symptom resolution occurred in most patients by day 7, consistent with prior studies. Importantly, early PVP-I therapy appears to reduce the development of subepithelial infiltrates and pseudomembrane formation, potentially preventing long-term visual complications.

Mechanism of Action: PVP-I exhibits virucidal activity by disrupting

viral capsid proteins and nucleic acids, leading to rapid viral inactivation. Its broad-spectrum activity, low cost, and safety profile make it an ideal therapeutic agent in epidemic or outbreak scenarios.

Limitations: Open-label, non-randomized design, short follow-up period, and absence of a comparative control arm. Future multicentric randomized controlled trials with larger sample sizes and longer follow-up are recommended to confirm these findings and optimize treatment protocols.

CONCLUSION

Topical 2% PVP-I eye drops are effective, safe, and well-tolerated for the treatment of AKC. They provide rapid symptom relief, reduce the risk of complications, and may limit viral transmission. Early intervention with PVP-I should be considered in clinical practice, especially in outbreak situations.

Table 1: Baseline Demographic And Clinical Characteristics

Characteristic	Number (n=100)	Percentage (%)
Mean Age (years)	33.8 ± 11.0	-
Male	58	58.0
Female	42	42.0
Follicular Conjunctivitis	99	99.0
Petechial Conjunctival Hemorrhage	98	97.9
Periauricular Lymphadenopathy	30	30.2
Conjunctival Pseudomembrane	5	5.2

Table 2: Clinical Outcomes After 7 Days of 2% PVP-I Treatment

Outcome	Improvement/ Occurrence (n=100)	Percentage (%)
Reduction in Discharge	93	92.7
Improvement in Conjunctival Injection	91	90.6
Reduction in Swelling	79	79.2
Subepithelial Infiltrates	22	21.9
Pseudomembrane Formation	14	13.5
Periauricular Lymphadenopathy	2	2.1

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