Study of refractive errors among Vernal Keratoconjunctivitis patients attending at Al-Sheikh Ahmed Ali Al-Imam Eye hospital in Dongola, Northern state of Sudan January 2024 – January 2025

Abstract

Background: Vernal keratoconjunctivitis (VKC) is a chronic, recurrent allergic ocular disease prevalent in tropical and subtropical regions. Prolonged ocular inflammation in VKC has been associated with structural and functional changes that may predispose patients to refractive errors. Despite the high prevalence of VKC in Sudan, limited research has investigated the relationship between VKC and refractive errors.

Objective: To determine the prevalence and patterns of refractive errors among VKC patients attending Al-Sheikh Ahmed Ali Al-Imam Hospital in Dongola, Sudan, and to assess correlations between VKC characteristics and refractive status.

Methods: A cross-sectional analytical study was conducted from January 2024 to January 2025. A total of 145 VKC patients were included. Data was collected using a structured questionnaire and ophthalmological examination including slit-lamp bio microscopy, fundus lens, Snellen chart visual acuity testing, retinoscope and autorefractometry. Data was analyzed using SPSS v25, with Partial Eta Squared applied to assess relationships between VKC duration and refractive error severity & VKC duration and keratoconus occurrence. Additionally, Chi Square test and Pearson Correlation were applied to assess relationship between socioeconomic status and severity of refractive error and the relationship between the type of refractive error and the clinical variant of VKC.

Results: Of 145 patients, 57.2% were male and 42.8% female, with mean age 8.3 ± 4.5 years (range: 2–23). Mixed VKC was the most common clinical type (82.1%). Refractive error prevalence was 73.8%, with astigmatism being the most frequent (53.9%), followed by myopia (17.2%) and hypermetropia (11.7%). Only 26.2% of patients were emmetropic. Visual acuity assessment revealed 39.3% with normal vision, 45.6% with mild impairment, 8.9% with moderate impairment, and 6.2% with severe impairment. 5.5% suffers Keratoconus and 6.2% have corneal scarring and neovascularization. Longer VKC duration was significantly correlated with refractive error severity ($r = 0.349$, $p < 0.001$) and keratoconus occurrence ($r = 0.241$, $p = 0.001$).

Conclusion: VKC is associated with a high burden of refractive errors, particularly astigmatism, among Sudanese children. Disease duration strongly influences refractive error severity and keratoconus development. Early refractive screening and follow-up are essential components of VKC management.

Keywords: Vernal keratoconjunctivitis, refractive errors, astigmatism, keratoconus, Sudan