

Incidence and Risk Factors of Refractive Regression following LASIK Surgery: A Systematic Review and Meta-Analysis

Abdulrahman Alamri, MD* Rayan Mohammed S. Almugharrid, Medical Student** Mohammed Saeed M Almousa, Medical Student** Saud Qasem A Alshabab, Medical Student** Fahad Yahya Ahmed Mushari, Medical Student** Fawaz Naif M AlQarni, Medical Student** Mohammed Abdulrahman H Ogran, Medical Student** Saif Tawfig M. Namri, Medical Student** Abdulmohsin Mohammed S. Alzuhairi, Medical Student** Faris Hatem A. Hejazi

ABSTRACT

Background: laser in situ keratomileusis (LASIK) is a widely used technique for myopia. However, regression of refraction is a common complication after long follow up periods. This study aims to evaluate the incidence and risk factors of refractor regression after LASIK surgery.

Methods: A systematic search on four databases (PubMed, Cochrane, Web of Science, and Scopus) retrieved all published articles till April 2024. The studies included if they were reported in English, assessing refractive regression after LASIK. Meta-analysis was conducted using OpenMeta analyst using the random effect model with 95% confidence interval (CI). Further meta regression analysis was conducted to test the correlation between the mean regression and some risk factors like spherical equivalent and age.

Results: The search yielded seven articles with 327 participants of 482 eyes. The analysis included 127 males and 159 females. The pooled analysis indicated significant regression occurs after refractive surgery $P < 0.001$. additionally, the analysis indicated the significant association between the mean regression and spherical equivalent which mean that patients with higher degrees of myopia, more negative spherical equivalent, have higher regression of their nearsightedness following LASIK.

Conclusion: This systematic review and meta-analysis is the first to provide comprehensive assessment of myopic regression following LASIK surgery. Our analysis indicated a higher incidence of refractive regression following LASIK. Also, the spherical equivalent is a significant risk factor for regression after long follow-up. Further research with more standardized protocols, with control arm, and long follow-up periods are important to investigate a wider range of risk factors that might increase the susceptibility of regression occurrence.

Keywords: LASIK; laser in situ keratomileusis; refractive error; regression; myopia; excimer laser

Bahrain Med Bull 2024; 46 (3): 2349 - 2355

* Department of Ophthalmology, College of Medicine , King Khalid University
Saudi Arabia. E-mail: Am2mari@gmail.com

** Medical student College of Medicine, King Khalid University, Saudi Arabia