

Prevalence of Refractive Error in Rural Myanmar

The Meiktila Eye Study

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Objective: To determine the prevalence of refractive error and associated risk factors in the Meiktila District of central rural Myanmar.

Design: Population-based cross-sectional study.

Participants: Randomized stratified cluster sampling of the inhabitants 40 years or older from villages in Meiktila was performed; 2481 eligible participants were identified, 2076 participated in the study, and adequate refractive data were obtained on 1863 individuals (75.1%).

Methods: Demographic data including age, gender, and education level were obtained from all participants. The ophthalmic examination included autorefraction, nuclear opalescence (NO) grading at the slit lamp, and applanation tonometry.

Main Outcome Measures: Refractive errors were classified by type of ametropia and their prevalence was determined. Univariate and multivariate analyses were performed and odds ratios were calculated for the predictors of refractive error within the statistical models.

Results: Mean refractive error measured -1.3 diopters (D) (standard deviation [SD], 2.9) and mean cylindrical error measured 1.1 D (SD, 1.5). Myopia of >-1.0 and >-6.0 D occurred in 42.7% (95% confidence interval [CI], 40.4%–44.9%) and 6.5% (95% CI, 5.4%–7.6%) of subjects, respectively. Myopic refractive error was associated significantly with a higher degree of NO ($P<0.001$) and age. Hypermetropia of $>+1.0$ D occurred in 15% (95% CI, 5.4%–7.6%) of the population and was associated with higher education levels ($P<0.001$). Astigmatism worse than 1.0 D occurred in 30.6% (95% CI, 28.5%–32.7%) of the population and was associated with age ($P<0.001$) and NO ($P<0.001$).

Conclusion: Myopia was more prevalent in older subjects and in those with increased NO. The prevalence rates of myopia in the ≥ 40 age group are higher than those found in other Asian regions and are likely to contribute to visual impairment. *Ophthalmology* 2008;115:26–32 © 2008 by the American Academy of Ophthalmology.



Previous ophthalmic epidemiological studies have demonstrated variability in refractive error between different ethnic groups.^{1–16} The majority of studies have been conducted in European-derived populations,^{1–9} but recently, large-scale population-based studies have provided data about refractive

errors in certain Asian regions.^{10–16} These studies have generally found high rates of myopia across Asia,^{10–16} particularly in the younger population. A study of 4439 subjects conducted in northern China found prevalence rates of myopia to be 22.9%¹¹ in individuals older than 40 years. In other parts of Asia, such as Andhra Pradesh in India, the prevalence rate of myopia was 36.5%,¹³ and in Sumatra, it was 26.1%.¹⁰ The prevalence of myopia in a study of 12 782 Bangladeshi individuals 30 and older was 22.1%.¹⁴ Hyperopia was present in 20.0%, 18.9%, and 18.5% of the Northern Chinese, Andhra Pradesh, and Indonesian populations, respectively.^{10,11,13}

Although information about refractive error in Asia has greatly increased in recent years, data from many regions remain scarce. To date, there have been no robust epidemiological data on refractive error from Myanmar, and the purpose of the current study is to report the prevalence of refractive error and its relationship to selected risk factors in rural Myanmar.

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