WORLD VIEW

Prevalence of glaucoma in rural Myanmar: the Meiktila Eye Study

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Aim: To determine the prevalence of glaucoma in the Meiktila district of central, rural Myanmar.
Methods: A cross-sectional, population-based survey of inhabitants ⩾40 years of age from villages in Meiktila district, Myanmar, was performed; 2481 eligible participants were identified and 2076 participated in the study. The ophthalmic examination included Snellen visual acuity, slit-lamp examination, tonometry, gonioscopy, dilated stereoscopic fundus examination and full-threshold perimetry. Glaucoma was classified into clinical subtypes and categorised into three levels according to diagnostic evidence.
Results: Glaucoma was diagnosed in 1997 (80.5%) participants. The prevalence of glaucoma of any category in at least one eye was 4.9% (95% CI 4.1 to 5.7; n = 101). The overall prevalence of primary angle-closure glaucoma (PACG) was 2.5% (95% CI 1.5 to 3.5) and of primary open-angle glaucoma (POAG) was 2.0% (95% CI 0.9 to 3.1). PACG accounted for 84% of all blindness due to glaucoma, with the majority due to acute angle-closure glaucoma (AACG).
Conclusion: The prevalence of glaucoma in the population aged ⩾40 years in rural, central Myanmar was 4.9%. The ratio of PACG to POAG was approximately 1.25:1. PACG has a high visual morbidity and AACG is visually devastating in this community. Screening programmes should be directed at PACG, and further study of the underlying mechanisms of PACG is needed in this population.

Glaucoma is the second most common cause of world blindness, and the majority of those blinded reside in Asia.[1][2] Recent studies have provided valuable information about the prevalence and subtypes of glaucoma in certain Asian regions,[3–12] and it has become recognised that angle-closure glaucoma is more common in people of Asian origin than those with European or African ethnicity[5][13–16]; however, the relative rates of open-angle to closed-angle glaucoma are region-dependent within Asia, with the rate of primary angle-closure glaucoma (PACG) particularly high in Mongolian and Chinese eyes,[5][8][17] and variable across India.[6][10–12][18] In accordance with the World Health Organization's (WHO's) Vision 20/20 initiative, the assessment of the prevalence of glaucoma subtypes is important because it has implications for the optimisation of screening programmes and treatment strategies.[19–23]

WHO estimates of the prevalence of glaucoma in many Asian regions are crude. Limited WHO data[24] and anecdotal evidence suggested high rates of angle-closure glaucoma in the Union of Myanmar (Myanmar; formerly Burma). Until now, no robust population-based data have been available on the prevalence and subtypes of glaucoma in Myanmar. Here, we report on the prevalence and subtypes of glaucoma in the inhabitants of the rural, central region of this country.

METHODS
Sampling procedure
The Meiktila Eye Study (MES) was a population-based, cross-sectional ophthalmic survey of the inhabitants of rural villages in central Myanmar. The principal aims of this project were to estimate the prevalence and causes of visual impairment, and the prevalence and risk factors of ocular disorders, including glaucoma, among persons ⩾40 years of age in this region.

The study was conducted within the Mandalay Division, an area encompassing 34 253 km^2 divided into seven second-order administrative districts of approximately equal size. The township of Meiktila (population approximately 251 000), located at

20°53′N, 95°53′ E, lies centrally in the Meiktila District, and is the only urban region in this entire district. The District is arbitrarily divided by the Ministry of Health (MOH) into six zones served by a centrally located eye hospital in Meiktila.

Participants were selected using a randomised, stratified, cluster sampling process. A sampling frame consisting of a list of all villages in the Meiktila District along with their populations was obtained from the MOH. Villages were arbitrarily stratified as large (population >825) or small (population ⩽825), with small villages in each of the six zones within the Meiktila District constituting six separate strata. For logistical reasons, sampling was restricted to villages within 3 h drive from Meiktila (an area encompassing approximately 80% of the district). All persons aged ⩾40 years from each selected village were eligible for inclusion. The sample size was based on the desired precision of the estimate of blindness (the principal aim of the MES); the assessment of glaucoma prevalence was a secondary objective. Healthcare workers from Meiktila township enumerated the selected villages (and advertised and promoted the survey) before commencement of the survey. Six small villages (one from each zone) and four large villages were enumerated, providing a total sample population of 2481 people.

Data collection
Data collection was performed at the end of the rainy season in November 2005. A single survey team conducted the entire study. Each team member was assigned specific tasks and was well trained in the appropriate area. Specific observations were done by 1–2 members, limiting or eliminating interobserver
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Abbreviations: AACG, acute angle-closure glaucoma; CDR, cup/disc ratio; FDT, frequency doubling technology; IOP, intraocular pressure; ISGEO, International Society for Geographic and Epidemiological Ophthalmology; MES, Meiktila Eye Study; MOH, Ministry of Health; PACG, primary angle-closure glaucoma; POAG, primary open-angle glaucoma; TM, trabecular meshwork; VA, visual acuity; WHO, World Health Organization