Pseudoexfoliation in a rural Burmese population: the Meiktila Eye Study

A M Abdul-Rahman,[1] R J Casson,[2] H S Newland,[2] J Muecke,[2] S McGovern,[2] T H Aung,[3] D Selva,[2] T Aung[3]

[1] Department of Ophthalmology, Middlemore Hospital, Auckland, New Zealand; [2] South Australian Institute of Ophthalmology, Adelaide, South Australia; [3] Yangon Eye Hospital, Yangon, Burma

Correspondence to:
Dr A M Abdul-Rahman, Department of Ophthalmology, Manukau SuperClinic, Private Bag 98743, South Auckland Mail Centre, Auckland, New Zealand; anmar_rahman@hotmail.com

ABSTRACT

Aims: The aim of this study was to report on the prevalence and correlates of pseudoexfoliation syndrome (PXF) in a rural Burmese population.

Methods: The study was a cross-sectional, population-based survey of the inhabitants $\geq$40 years in the Meiktila District. Ophthalmic examination included Snellen visual acuity, slit lamp examination, tonometry, gonioscopy, dilated fundus examination and frequency doubling perimetry.

Results: In a population of 2076 subjects (4016 eyes) the prevalence of PXF was 3.4% (95% CI 2.14 to 4.67%; 78 eyes). Twelve eyes with PXF were blind. In the univariate analysis, PXF was associated with: increasing age, blindness (odds ratio (OR) 4, 95% CI 1.84 to 8.68; p<0.0004), increasing intraocular pressure (IOP) (OR 1.08, 95% CI 1.04 to 1.11; p<0.00001), nuclear cataract (OR 6.92, 95% CI 2.89 to 16.59; p<0.00001), cortical cataract (OR 4.78, 95% CI 2.37 to 9.65; p<0.00001) and the presence of an occludable angle (OR 3.05, 95% CI 1.52 to 6.13; p<0.002). In the multivariate analysis, only increasing age and IOP remained significantly associated with PXF.

Conclusions: The prevalence of PXF in the Burmese population is greater than previously reported in other East Asian populations. Increasing age and IOP are the strongest predictors of PXF, and it is associated with cataract, occludable angles and blindness.

Pseudoexfoliation (PXF) is a disease characterised by the production and progressive accumulation of a fibrillar extracellular material in many ocular tissues.[1] PXF has a worldwide distribution and its prevalence increases universally with age,[2–13] but age-specific prevalences vary widely between populations; reports of some associations, including sex and sunlight exposure, are often conflicting, suggesting a complex mix of genetic and environmental causation.

The prevalence of PXF in Chinese eyes (<0.5% in those $\geq$40 years of age) is the lowest reported for any population.[13] Recent population-based studies from southern India have reported higher rates in these populations and have highlighted its association with cataract, glaucoma and blindness in these populations. Prevalence data from other Asian regions, particularly south-east Asia, are scarce.[11 12 14]

Central, rural Burma has one of the highest reported blindness rates in the world, with cataract and glaucoma, particularly angle-closure glaucoma (ACG), accounting for the majority of the burden.[15] However, the prevalence of PXF in this population was considered to be low. The known association of PXF with cataract, glaucoma (especially ACG) and complicated cataract surgery makes an understanding of the prevalence of PXF and its correlates in this population particularly important. We present data relating to the prevalence, clinical correlates and biometric variables associated with PXF in a rural population of central Burma.

MATERIALS AND METHODS

The Meiktila Eye Study (MES) was a population-based cross-sectional ophthalmic survey of the inhabitants of rural villages in central Burma who were $\geq$40 years. 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 sampling frame for this study consisted of a sample of six rural zones that together comprise the Meiktila District.

Participants were selected using a stratified random cluster sampling process. A sampling frame consisting of the list of all villages in the Meiktila District with their populations obtained from the Ministry of Health. For logistical reasons, sampling was restricted to villages within 3 h drive from Meiktila (an area encompassing approximately 80% of the District).

Data collection

Data were collection from November 2005 to February 2006. A single survey team conducted the entire study. All equipment and personnel were transported to each village, and the data were collected on-site. Those with treatable disease were offered referral to Kandy Hospital.

There were six geographical zones within the Meiktila District: these constituted the strata. Medical and ophthalmic history were obtained from each patient in their own language by qualified healthcare workers. Each participant then received a comprehensive eye examination, including Snellen acuity, Goldmann tonometry and slit lamp examination of the anterior segment; the presence or absence of PXF material on the lens, iris or pupil margin was recorded. The undilated slit lamp examination and gonioscopy were performed by two experienced ophthalmologists (RJC and SM). Static gonioscopy was performed using a Sussman four mirror gonioscope; each quadrant was graded using the Scheie classification. If >90° of posterior trabecular meshwork (TM) was visible the pupil was dilated with tropicamide 1% and phenylephrine 2.5%. Eyes with $\leq$90° of posterior