Central corneal thickness among Aboriginal people attending eye clinics in remote South Australia

Shane R Durkin MBBS(Hons) MPH,1,2 Edwin WH Tan,1 Robert J Casson DPhil FRANZCO,1,2 Dinesh Selva FRANZCO1,2 and Henry S Newland MPH FRANZCO1,2

1South Australian Institute of Ophthalmology, and 2The University of Adelaide, Department of Medicine, Adelaide, South Australia, Australia

ABSTRACT

Purpose: To determine the central corneal thickness (CCT) and its demographic associations among Aboriginal people attending eye clinics in remote South Australia.

Methods: A clinic-based cross-sectional study was conducted involving opportunistic sampling of patients. Eligible participants underwent measurement of CCT by ultrasound pachymetry. The results were compared with a group of Caucasian control patients.

Results: All patients (189) who were invited to participate in the study had their CCT measured. The mean age was 44.8 ± 14.5 years, and women comprised 57.7% of the sample. The control group consisted of 115 Caucasian participants. The mean age was 47.1 ± 14.8 years, and women accounted for 55.7% of the sample. Mean CCT for Aboriginal participants was 514.9 ± 30.5 μm in the right eye and 515.6 ± 30.5 μm in the left eye (t = 1.1, P = 0.3). Mean right CCT for Caucasian participants was 544.6 ± 31.9 μm and mean left CCT in this group was 547.1 ± 32.2 μm (t = 4.6, P < 0.001). There was a significant difference between the right (t = 8.4, P < 0.001) and left (t = 8.8, P < 0.001) CCT of Aboriginal and Caucasian participants.

Conclusions: The CCT among Aboriginal patients attending eye clinic in remote South Australia was significantly thinner than that of a Caucasian control group. Thinner corneas among this group of Aboriginal patients may indicate a need to adjust intraocular pressure according to CCT and to be more vigilant for glaucoma.

Key words: Aboriginal, Australia, central corneal thickness.

INTRODUCTION

The Goldmann applanation tonometer is the gold standard for measuring intraocular pressure (IOP) as the reading is not affected by scleral rigidity.1,2 However, central corneal thickness (CCT) does affect IOP measurement with the applanation tonometer3–7 such that the most accurate results are achieved with a CCT of 500 μm.2 Formulae have been developed to account for CCT and its influence on IOP.3,6,9 These corrections are theoretical in nature, but have been shown to be significant when determining the progression of ocular hypertension to glaucoma in some studies.10 Other factors that affect IOP measurement include corneal hydration and composition of the corneoscleral shell.11,12

Furthermore, CCT has been found to be significantly higher among ocular hypertensive eyes when compared with normal eyes8,13–21 and CCT among normal tension glaucomatous (NTG) eyes has been found to be thinner than in normal eyes.15,17–19,22 Whereas CCT among primary open-angle glaucomatous (POAG) eyes is generally not considered to be significantly different from that in normal eyes.14,15,17,19,22

Central corneal thickness has also been noted to vary among the different races.5,24–28 For example, the mean CCT of African American and Mongolian eyes has been found to be significantly thinner than that of Caucasian eyes.5,24,25,27–29 The Ocular Hypertension Treatment Study found that the CCT of African American participants was on average 23 μm thinner than Caucasian participants.24 There appear to be few reports of CCT among Aboriginal people in Australia. This paper aims to describe the CCT among a