

# Original Article

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

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### 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  $44.8 \pm 14.5$  years, and women comprised 57.7% of the sample. The control group consisted of 115 Caucasian participants. The mean age was  $47.1 \pm 14.8$  years, and women accounted for 55.7% of the sample. Mean CCT for Aboriginal participants was  $514.9 \pm 30.5 \mu\text{m}$  in the right eye and  $515.6 \pm 30.5 \mu\text{m}$  in the left eye ( $t=1.1, P=0.3$ ). Mean right CCT for Caucasian participants was  $544.6 \pm 31.9 \mu\text{m}$  and mean left CCT in this group was  $547.1 \pm 32.2 \mu\text{m}$  ( $t=4.6, P<0.001$ ). 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.<sup>1,2</sup> However, central corneal thickness (CCT) does affect IOP measurement with the applanation tonometer<sup>2–7</sup> such that the most accurate results are achieved with a CCT of  $500 \mu\text{m}$ .<sup>2</sup> Formulae have been developed to account for CCT and its influence on IOP.<sup>3,8,9</sup> 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.<sup>10</sup> Other factors that affect IOP measurement include corneal hydration and composition of the corneoscleral shell.<sup>11,12</sup>

Furthermore, CCT has been found to be significantly higher among ocular hypertensive eyes when compared with normal eyes<sup>8,13–21</sup> and CCT among normal tension glaucomatous (NTG) eyes has been found to be thinner than in normal eyes.<sup>15,17–19,22,23</sup> Whereas CCT among primary open-angle glaucomatous (POAG) eyes is generally not considered to be significantly different from that in normal eyes.<sup>14,15,17,19,22</sup>

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

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