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ARVO Annual Meeting Abstract | June 2020

Calcium Channel Blocker Use and Risk of Glaucoma in a Large United Kingdom Population

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Abstract

Purpose : Evidence from insurance claims data suggests an increased risk of primary open angle glaucoma (POAG) with the use of systemic calcium channel blockers (CCBs). We aimed to further examine the association of CCB use with POAG and related traits in a very large UK population-based cross-sectional study.

Methods : We used data from the UK Biobank, a multisite cohort study of over 500,000 participants. An eye-health related questionnaire and examination were introduced in the latter part of the study (2009-2010). POAG status was ascertained by a combination of self-report on a baseline questionnaire and linkage with hospital procedure data (ICD-10 code H40.1). Corneal compensated intraocular pressure (IOP) was measured using the Ocular Response Analyser and pre-treatment values for those on glaucoma medication imputed by dividing by 0.7. Macular retinal nerve fiber layer (mRNFL) and ganglion cell-inner plexiform layer (GCIPL) thicknesses were derived from spectral-domain optical coherence tomography (OCT) scans (Topcon 3D OCT-1000 Mark II). Refractive status was measured by autorefraction (Tomey RC5000). CCB use was ascertained by interview. We used logistic regression to examine the association between CCB use and POAG, and linear regression to examine the associations between CCB use and IOP, GCIPL and mRNFL. All analyses were adjusted for age, sex, spherical equivalent and ethnicity.

Results : In total, we included 121,967 participants with a mean age of 57 years. Of these, 2,328 (1.9%) had POAG and 10,760 (8.8%) were using CCBs. CCB use was associated with an increased prevalence of POAG (OR 1.20, 95% CI: 1.06, 1.34, *P*=0.002*)*. For analyses of IOP and macular thickness, there were complete data for 116,358 and 43,085 participants, respectively. There was no significant association between CCB use and IOP (-0.02 mmHg, 95% CI: -0.10, 0.06, *P*=0.63). CCB use was associated with a thinner mRNFL (-0.28 µm, 95% CI: -0.42, -0.15, $P=2.8\text{x}10^{-5}$) and a thinner GCIPL (-0.54 µm, 95% CI: -0.71, -0.36, $P=2.3\text{x}10^{-9}$).

Conclusions : Our study provides further evidence that CCBs might increase the risk of POAG. The magnitude of association was substantial (20% increased prevalence in users). The significant association with inner retinal thickness but not with IOP suggests that the potential harmful effect of CCBs is mediated via IOP-independent mechanisms.

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