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Sir, Fuchs endothelial corneal dystrophy and macular drusen: evidence for coincidence?

The corneal endothelium and the retinal pigment epithelium represent monolayers of postmitotic polygonal cells of neuroectodermal origin with barrier and transport function. Fuchs endothelial corneal dystrophy (FECD) and age-related macular degeneration (AMD) show interesting similarities including cellular degeneration with deposition of PAS-positive extracellular matrix (ECM) in the form of guttae and drusen occurring preferentially centrally in close proximity to the ocular light path (Figures 1a and b). Risk factors for both entities include advanced age, cigarette smoking, and female gender. In this study, we aimed to evaluate if an increased presence of macular drusen may be found in FECD patients to support a hypothetical association between both entities.

Consecutive FECD patients undergoing Descemet membrane endothelial keratoplasty (DMEK) surgery were compared to consecutive control patients without corneal pathology regarding the presence of macular drusen using standardized spectral domain optical coherence tomography (SD-OCT) and near-infrared reflectance (NIR) analysis (Spectralis HRA +OCT; Heidelberg Engineering GmbH, Heidelberg, Germany; Figures 1c and d) by three masked investigators (AC, EE, MM). OCT imaging specifications: scan area 20° × 15°, centered on fovea, 37 parallel OCT B-scans (distance between B-scans ~ 120 μm), 20 images averaged per B-scan. NIR specifications: λ = 830 nm; field of view 30° × 30° centered on fovea, image resolution 768 × 768 pixels. An eye was considered as 'drusen-positive' if at least one druse was detected on at least one OCT B-Scan and confirmed using the NIR image. Owing to the dependency in the data structure, as both eyes per patient were examined, the effect of FECD, age, gender and previous cataract surgery on drusen was modeled with generalized estimating equations (GEE).

Patient demographics are shown in Table 1. SD-OCT/NIR analysis revealed macular drusen in 66 of 213 FECD patients (31%) (110 of 396 FECD eyes (28%)) and in 51 of 181 normal cornea control patients (28%) (74 of 324 normal cornea control eyes (23%)). There was no significant impact of FECD on the presence of drusen of the macula (OR = 1.441; CI: 0.902–2.302; *P* = 0.126; Figure 1e). The presence of drusen was age-dependent in both groups (OR = 1.094; 95% CI: 1.064–1.124; *P* < 0.001; Figure 1f). Gender (OR = 0.729; 95% CI: 0.458–1.160; *P* = 0.183) and previous cataract surgery (OR = 1.192; 95% CI: 0.751–1.892; *P* = 0.456) did not show any significant association.

Our data confirm the general age-dependent presence of macular drusen.¹ However, we did not find any correlation between macular drusen and FECD. These results are supported by earlier results from the Reykjavik eye study which also reported no increased prevalence of age-related macular degeneration in citizens of Reykjavik, Iceland, 55 years and older with primary central corneal guttae.² Rao *et al*³ were able to demonstrate a relationship between FECD and AMD using slit lamp biomicroscopy and indirect funduscopy. The diverging outcome between studies may at least in part be related to different patient cohorts and grading methodology. Future validation studies should include a prospective design, simultaneous SD-OCT, funduscopy, and potentially fluorescence angiographic analyses that would facilitate to focus more specifically on distinct stages and on distinct subtypes of drusen such as reticular pseudodrusen or basal laminar drusen.

Conflict of interest

The authors declare no conflict of interest.

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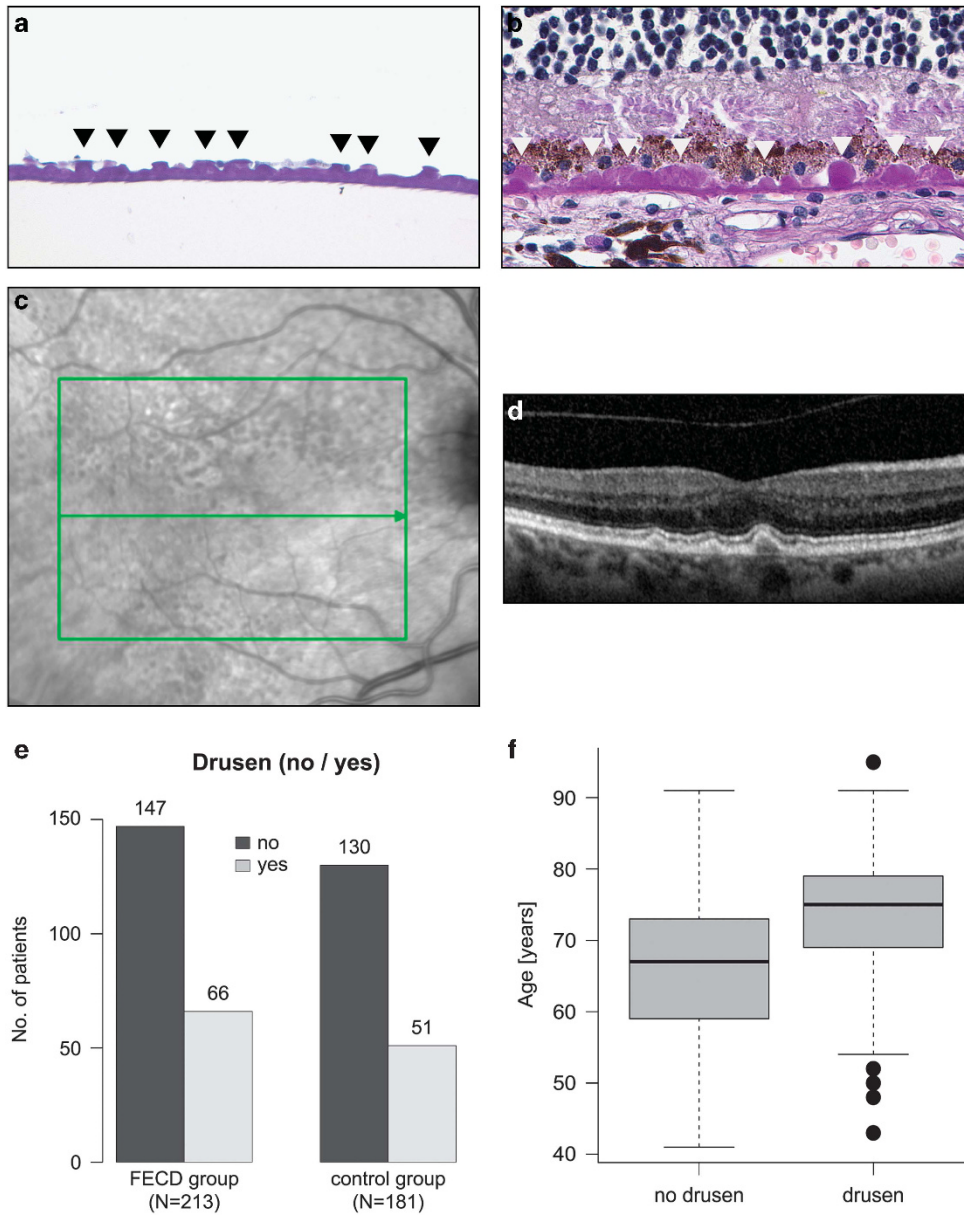


Figure 1 (a, b) Periodic acid-Schiff reaction staining of guttae (black triangle) of a stripped Descemet's membrane in Fuchs endothelial corneal dystrophy (FECD) and drusen (white triangle) in age-related macular degeneration (AMD). (c, d) Near-infrared reflectance (NIR, c) image and simultaneous spectral domain-optical coherence tomography (SD-OCT, d) of an eye with macular drusen. (e, f) Analysis of macular drusen in FECD and control group showed no significant difference between both groups (e). Presence of macular drusen correlated to patient age with higher presence of drusen in older patients (f).

Table 1 Patient demographics

	FECD	Normal cornea control	P-value
n_{patients}	213	181	—
Age \pm SD	68.03 \pm 9.97	68.21 \pm 11.76	$P=0.870$
Gender (female:male)	116:97	96:85	$P=0.857$
n_{eyes}	396	324	—
Phakic _{eyes} : pseudophakic _{eyes}	262:134	263:61	$P<0.001$

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**Sir,
East of England regional retinopathy of prematurity
service: lessons from the first year**

Retinopathy of prematurity (ROP) affects 50% of babies screened and, of these, 4% will develop sight threatening