Intergrader variability in the Geographic Atrophy Incidence Study (GAINS) in Gloucestershire, United Kingdom.

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INTRODUCTION

A 5-year retrospective audit using Medisoft to identify all patients with Geographic Atrophy (GA) in Gloucestershire showed high intergrader variability.

A team of clinicians were trained by an experienced medical retina consultant to grade Optical Coherence Tomography (OCT) images for features of GA as defined by the Consensus on Atrophy Meeting (CAM) group criteria.

METHODOLOGY

The 10 members of the grading team consisted of 50% ophthalmologists and 50% other allied health professionals. They undertook a one-hour training session by an experienced medical retina consultant prior to grading OCT images.

A random sample of 50 patients (5% of the sample) were secondary graded by the same medical retina consultant to check reproducibility and inter-grader variability. The areas assessed were the 1) diagnosis of GA, 2) presence of cRORA (complete RPE and outer retinal atrophy) and 3) Foveal involvement.

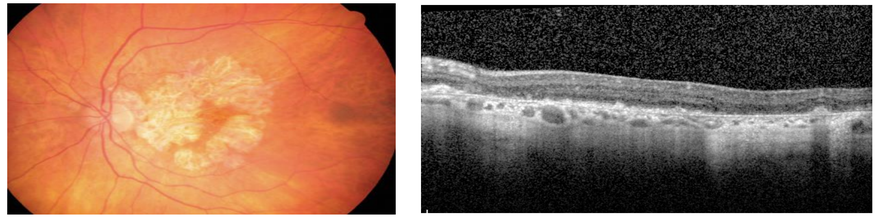


Figure 1: A) Colour photograph of Geographic Atrophy. B) Choroidal Hypertransmission: Loss of RPE and outer retina allows OCT to penetrate deeper and get a “shadow” below RPE. If this area is more than 250 microns, it’s referred to as cRORA.

Foveal involvement: If a there is cRORA (i.e hypertransmission defect >250microns) within 125microns of central macula (fovea) (Figure 2).

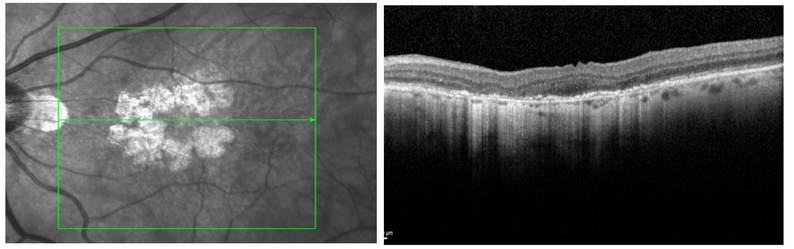


Figure 2: showing Infrared image and OCT macula of fovea involving GA

Cohen’s kappa values were used to measure the inter grader variability and a value of >0.70 was considered to be good agreement.

RESULTS

- There was only slight agreement (kappa=0.20) in the classification of cRORA and iRORA making it the biggest variation in grading (Table 1).

	Grader 1			
	cRORA	Yes	No	Total
Grader2	Yes	4	1	5
	No	21	1	22
	Total	25	2	27

Table 1: showing values for Kappa values of 2 graders

- There was moderate agreement when grading more broadly as GA vs non-GA (kappa = 0.42).
- There was good agreement on the classification of foveal involving GA or not. (kappa =0.78).

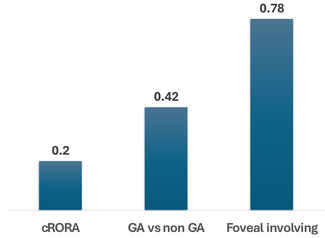


Figure 3: Kappa values of the different criteria

CONCLUSION

Although a small sample was used for secondary grading, it highlighted the high interobserver variability and the need for further training.

Consequently, further training was conducted to identify features of GA, data collection forms were streamlined, and all data was routinely secondary graded.

An arbitration process with an experienced medical retina consultant was implemented for any discrepancies and any cases where an agreement was not reached were excluded.

References
1. Chandra S, Rasheed R, Sen P, Menon D, Sivaprasad S. Inter-rater reliability for diagnosis of geographic atrophy using spectral domain OCT in age-related macular degeneration. Eye (Lond). 2022 Feb;36(2):392-397. doi: 10.1038/s41433-021-01490-5. Epub 2021 Mar 8. PMID: 33686233; PMCID: PMC8807831.
2. Sadda, S. R., Guymer, R., Holz, F. G., Schmitz-Valckenberg, S., Curcio, C. A., Bird, A. C, et al (2018). 'Consensus Definition for Atrophy Associated with Age-Related Macular Degeneration on OCT: Classification of Atrophy Report 3', Ophthalmology, 125(4), pp. 537-548. PMID: 29103793