AN EVALUATION OF ULTRA-WIELD FIELD (UWF) IMAGING MODALITIES, AND THEIR IMPACT ON CLINICAL DECISION MAKING IN THE MEDICAL RETINA (MR) VIRTUAL SERVICE

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Overview:

Virtual clinics have proven to be an effective solution to meet the increasing demands placed on medical retina services. However, significant issues have been highlighted with imaging quality. In a 2018 study by Korteum et al, the main reason for Face to Face (F2F) follow-up was poor image quality. However, as far as the authors are aware, there have been no audits evaluating how different UWF imaging modalities impact image quality and clinical decision making in the MR virtual service.

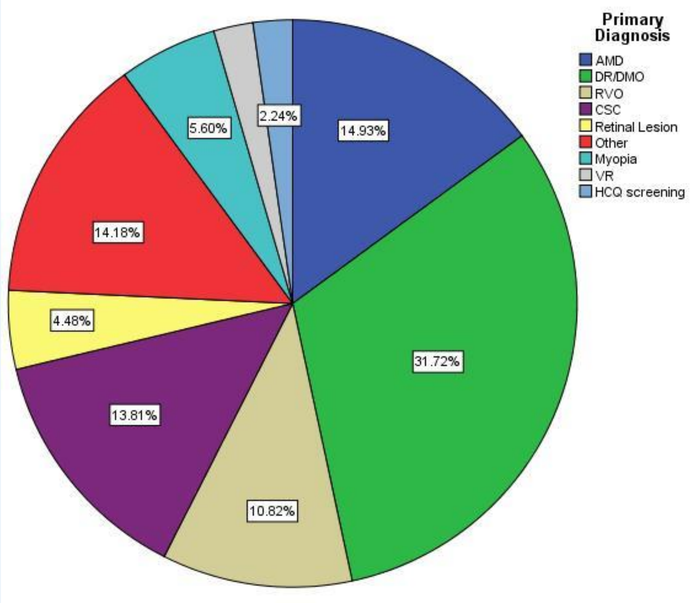
The primary aim of this study is to determine whether different ultra-widefield (UWF) imaging modalities impact image quality and clinical decision-making in the medical retina virtual service. Secondary aims include identifying the types of pathology seen in the medical retina virtual clinic, determining the proportion of new and follow-up patients assessed, and evaluating how many follow-up patients were booked for face-to-face or continued virtual review, with an analysis of differences in reasons for follow-up. Additionally, the study seeks to assess the reproducibility of image acquisition.

Methods:

A two-month prospective audit was conducted between September and October 2024, during which the following information was collected: patient age, ethnicity, site, primary diagnosis, whether the patient was new or a follow-up, future follow-up location (virtual or face-to-face), time frame for follow-up, and the primary reason for follow-up. Additional data included whether the review was for clinical reasons alone, the presence of clinically significant artefact, insufficient field of view (FoV), poor image quality, the need for further imaging, and any secondary reason for follow-up. The type of ultra-widefield (UWF) imaging modality used was recorded, as well as whether pseudocolour/colour images, fundus autofluorescence (FAF), and sensory red free/red free images were acquired.

Results:

The ethnic distribution of patients was 34.08% other, 27.34% white, 11.24% Black, and 27.34% Asian. The primary diagnoses included diabetic retinopathy (28.45%), age-related macular degeneration (AMD) (16.78%), retinal lesions (12.93%), central serous chorioretinopathy (CSCR) (11.59%), retinal vein occlusion (RVO) (9.72%), myopia (7.1%), hydroxychloroquine (HCQ) toxicity (3.6%), and other conditions (10.83%).There was no statistically significant difference between Optos and Clarus imaging modalities (p=0.228) regarding the rates of artefact, insufficient field of view (FoV), need for further imaging, overall poor image quality, or clinical decision-making based solely on clinical need without image quality issues. However, there was a statistically significant difference in the acquisition of FAF and red-free or sensory red-free images between UWF imaging modalities (p=0.001). Optos imaging achieved 100% acquisition of FAF and sensory red-free images, whereas Clarus imaging had lower rates, with 78% for FAF and 82% for red-free images. Regarding follow-up decisions, a statistically significant higher rate of face-to-face (F2F) follow-up was found for cases with red flag pathology (p=0.001), anterior segment assessment (p=0.001), and unexplained vision loss (p=0.001), whereas routine (non-red flag) pathology was more often followed up virtually (p=0.001).



Conclusion and Learning:

Virtual clinics are an effective approach to managing the increasing workloads and demand for medical retina services. The majority of clinical decision-making was based solely on clinical need; however, approximately 10% of decisions were influenced by insufficient or poor image quality. The type of UWF imaging modality used did not impact this aspect. Nevertheless, the reproducibility of FAF and Red-Free/Sensory red-free imaging was found to be greater with the Optos system compared to the Clarus system.