The Impact of COVID-19-Related Delays on Visual Outcomes in Glaucoma Patients: A Retrospective Cohort Study Across Two Tertiary Centres in London, UK

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This study was conducted at the Western Eye Hospital (153-173 Marylebone Rd, London NW1 5QH) and Charing Cross Hospital (Fulham Palace Rd, London W6 8RF)

Background

- Glaucoma is the leading cause of irreversible blindness globally, estimated to affect approximately 700,000 people in the UK (1). As a heterogeneous group of progressive optic neuropathies, glaucoma is characterised by the degeneration of retinal ganglion cells and their axons, ultimately leading to irreversible vision loss (2).
- The World Health Organisation (WHO) declared COVID-19 to be a global pandemic on 11th March 2020 (3). This prompted significant changes in eye care delivery, in line with national lockdowns and social distancing measures. The highly transmissible nature of the virus resulted in the postponement of most non-emergent appointments, including IOP monitoring and glaucoma procedures such as trabeculectomies, where the immediate loss of vision was not a concern
- This potentially influenced glaucoma patient outcomes, such as visual field mean deviation (VFMD), IOP and best-corrected visual acuity (BCVA).

Aims

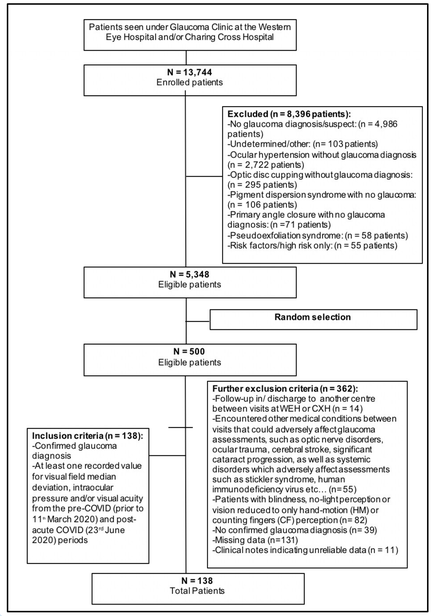
- The aim of this study is to explore if extended appointment delays during the COVID-19 pandemic correlate with poorer visual outcomes in glaucoma patients.
- Significant correlation between longer appointment delays and worse visual outcomes for glaucoma patients, would provide a foundation to explore which specific subgroups of patients, if any, are more adversely affected by delays and would allow for a proactive approach in granting these groups clinical prioritisation.

Methods

Primary Outcome: Visual Field Mean Deviation (Sensitivity to glaucoma progression, standardised measurement)

Secondary Outcomes: Intraocular Pressure (Modifiable risk factor) and Best-Corrected Visual Acuity (Functional outcome)

Spearman's rank correlation coefficients were calculated to assess the correlation between the total delay in appointments and the primary and secondary outcomes (VFMD, IOP, and BCVA). Multiple linear regression analyses were conducted to determine the association between VFMD and glaucoma outcomes, adjusting for potential confounders.



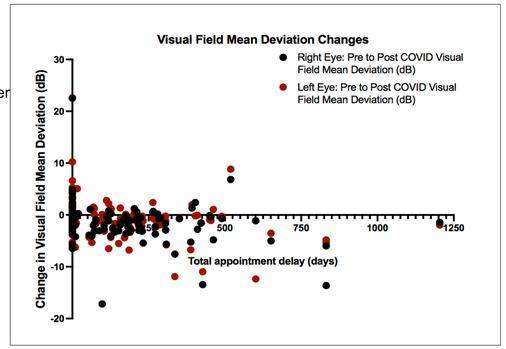
Main Findings

We found a strong, significant negative correlation between VFMD and appointment delays

Primary Outcome:
Visual Field Mean Deviation
Each dot represents an individual measuremer

Right eye data:
(r) =-0.3271, 95% CI [-0.4795 to -0.1557]
P= 0.0002

Left eye data:
(r) =-0.2027, 95% CI [-0.3699 to -0.02286]
P= 0.0234



Key finding 1: Increased appointment delays were linked with a significant decrease in MD, suggesting that more prolonged delays led to poorer visual field outcomes in this population

Key finding 2: Multiple Linear Regression analysis indicated a significant decline in MD among African and Mixed White/Black Caribbean ethnicities for both eyes, and diabetics for the left eye data. This suggests that visual fields of these groups were notably impacted by extended delays.

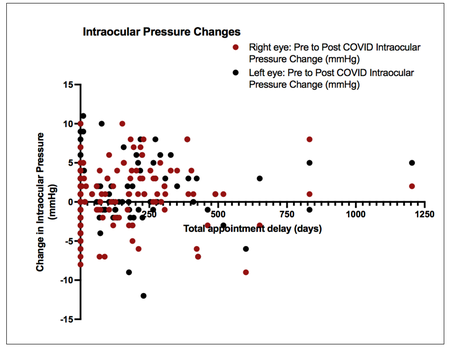
We found a weak positive correlations with IOP and BCVA changes

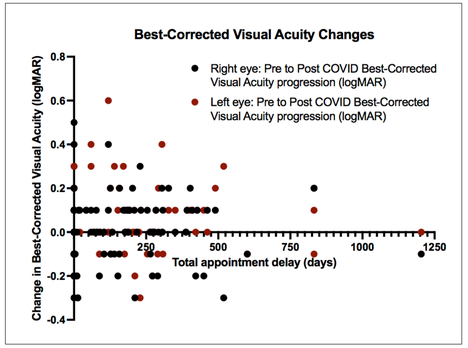
For IOP:
Right eye data: r=0.1508, 95% CI [-0.02998 to 0.3220] p= 0.0919

Left eye data: r=0.08449, 95% CI [-0.09995 to 0.2633], p=0.3548
For BCVA

Right eye data: r=0.1196, 95% CI [-0.07036, 0.3012] p= 0.0919

Left eye data: r= 0.1558, 95% CI [-0.03195 to 0.3328], p= 0.0963





Key finding 3: no significant correlation between IOP and BCVA changes and appointment delays over the first UK COVID-19 lockdown

Conclusion

- Our findings demonstrate a significant association between increased appointment delays and worse visual field outcomes in our sampled population, at two tertiary centres in London.
- We found those with African and White & Black Caribbean ethnicities showed disproportionately worse visual field outcomes than the rest of the studied population; however, this requires further investigation to prove. Similarly, there is some evidence within this study to suggest that those with diabetes were also disproportionately affected and endured poorer visual field outcomes, but this remains inconclusive.
- We found that there was no significant correlation between appointment delays and worsening of BCVA, nor increase in IOP over the acute COVID-19 period..

1. Allison K, Patel D, Alabi O. Epidemiology of Glaucoma: The Past, Present, and Predictions for the Future. Cureus [Internet]. 2020 Nov 24;12(11). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7769798/ 2. Gupta D, Chen PP. Glaucoma. American Family Physician [Internet]. 2016 Apr 15;93(8):668–74. Available from: https://pubmed.ncbi.nlm.nih.gov/27175839/ 3. Cucinotta D, Vanelli M. WHO Declares COVID-19 a Pandemic [Internet]. Acta bio-medica : Atenei Parmensis. 2020. Available from: https://pubmed.ncbi.nlm.nih.gov/32191675/