

Do patient demographics influence AMD clinic attendance during COVID-19 lockdown?

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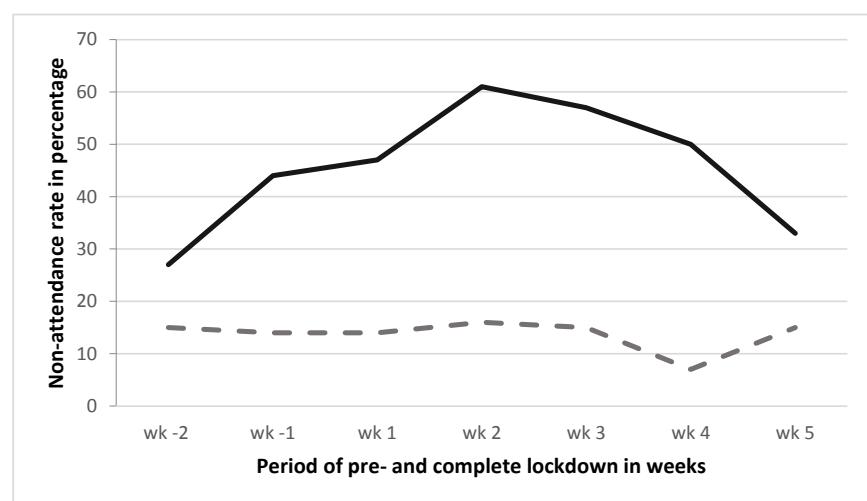
The authors assess the impact of the COVID-19 pandemic on adherence to scheduled clinic appointments among age-related macular degeneration patients in a clinic in North Wales.

The COVID-19 pandemic has significantly affected the population, affecting economic and social wellbeing, whilst claiming thousands of lives worldwide. Currently, the disease has spread to 219 countries with nearly 130 million infected cases and over 2.8 million deaths to date worldwide. The United Kingdom has reported about 4.4 million cases and over 126,000 deaths [1]. A nationwide lockdown was imposed by the British government on 23 March 2020 and has continued partially to date [2].

The NHS has had to reorganise in the face of this new challenge. For example, all elective NHS activity was cancelled on 17 March 2020 [3]. There has been an immense impact on ophthalmic care as well. Various organisations such as The Royal College of Ophthalmologists (RCOphth) and the American Academy of Ophthalmology (AOO) have published emergency guidelines for ophthalmic care during the pandemic [4,5].

Whilst routine eye outpatient clinics and all elective ophthalmic surgeries were cancelled, the RCOphth recommended continued care for sight-threatening conditions such as wet age-related macular degeneration (AMD), proliferative diabetic retinopathy and ophthalmic emergencies. Intravitreal injections for wet AMD continued to be performed throughout the period of lockdown to prevent irreversible sight loss [6].

AMD mainly affects the elderly population. At the same time, this vulnerable group often carry an increased risk of COVID-19 associated mortality and morbidity, both due to their age and other co-existing comorbidities [7,8]. Furthermore, slit-lamp examination and intravitreal injection procedures carry a higher risk of transmission, as



close proximity provides an appropriate environment for virus transmission. On the other hand, irreversible sight loss caused by withholding of intravitreal therapy in wet AMD can lead to an adverse long-term social and economic impact.

Globally, there has been an unprecedented lack of patients presenting to accident & emergency departments for medical care, even in potentially life-threatening situations, due to fear of contracting the virus [9,10,11]. In ophthalmology, there are reports in literature of patients failing to keep their eye clinic appointments for sight-threatening conditions [12,13,14].

The present study aims to discern what factors affect AMD clinic attendance during the period of lockdown, such as age, gender and visual acuity (VA) in the UK.

Materials and methods

A retrospective evaluation of AMD clinic attendances in a district general hospital in North Wales was carried out. All scheduled

clinic appointments for the six-week period between 9 March 2020 (i.e. two weeks before the lockdown) and 22 April 2020, were considered for analysis. This is the period during which pre- and complete lockdown measures were implemented across the UK. AMD clinic non-attendance rate during the corresponding six-week period in 2019 was taken for comparison.

More detailed analysis of factors affecting attendance rate such as age, gender and VA, and comparison of attendant and non-attendant groups was performed for the actual period of complete lockdown from 23 March 2020 to 22 April 2020.

Data was obtained from the wet AMD patient electronic database and medical records at the ophthalmology department. Approval for data collection and use was obtained from the ophthalmology department as well as the institutional audit department. The data was managed and stored in accordance with University Health Board guidance on data protection.

Comparison of data was performed using Student t test and a p value <0.05 was taken as statistically significant.

Results

During the six-week period from 9 March 2020 to 22 April 2020, a total of 503 appointments were scheduled, of which only 273 appointments were kept. There were 230 patients who Did-Not-Attend (DNA) or Could-Not-Attend (CNA) averaging a 45.7% rate of non-attendance. This was compared to a 13.5% rate of non-attendance in the corresponding time period in 2019 (Figure 1). A higher rate of absence was noticed even before complete lockdown. There had been a 27% DNA rate two weeks prior, increasing up to 44% one week prior to lockdown. The DNA rate peaked at 61% in the second week of total lockdown.

Detailed analysis on factors affecting the non-attendance rate was performed for the period 23 March 2020 to 22 April 2020. There were a total of 324 scheduled AMD clinic appointments for the four-week period. As patients who failed to attend were automatically rebooked for another appointment in one to two weeks, there were some patients who had DNA'd more than once. As such, only 255 patients were considered for analysis after the removal of duplications. Overall, 64% of patients were female. There was no difference in the male to female ratio amongst those who attended (65% female) and those who DNA'd (63% female) during this period. The mean age of those who attended was 78 ± 1 years, whilst the mean age of those who DNA'd was 81 ± 1 years. This difference was statistically significant ($p=0.001$) at 5% level of significance. The DNA rate among patients who received treatment for only one eye (42.57%) was higher than those who received treatment to both eyes (32.07%).

Further analysis of those who had only one eye treated was carried out to see whether VA of the treated eye or untreated eye was having any effect on clinic attendance rate. Mean VA of treated eye of those who DNA'd was significantly worse in comparison to the attended patients ($p=0.001$). Meanwhile, the attended group had a slightly better VA of LogMAR 0.44 in the untreated fellow eye in comparison to LogMAR 0.48 of VA in the DNA group. However, this difference was not statistically significant ($p=0.399$).

Discussion

The current study demonstrated a reduction in AMD clinic attendance during the initial stages of pandemic even prior to lockdown. Almost half of patients (45.7%) failed to keep their scheduled appointments, suggesting that there may have been an inherent fear

of visiting a hospital where active COVID-19 patients were present. The DNA group was significantly older than the attended group. This may be because the older patients were more likely to have other systemic comorbidities and therefore, more likely to be shielding. Gender did not seem to be an influencing factor. Meanwhile, patients who received treatment for both eyes were more likely to attend. All patients were Caucasian and therefore we are unable to comment about the role of ethnicity.

Of those patients for whom only one eye was being treated, the DNA group had significantly worse VA in the treated eye. This suggests that the VA in the treated eye may be an influencing factor. Perhaps these patients might have felt that given the vision in their treated eye was poor anyway, the risks associated with catching COVID-19 as a consequence of attending an acute hospital site outweighed the benefits of treatment. On the other hand, the better the VA of the treated eye, the more likely patients were to attend. One could speculate that these patients were keen on continued treatment as they wished to maintain or improve their vision to within DVLA standards for driving. VA of the untreated fellow eye did not show an effect on attendance rate in the group where only one eye was treated.

There is limited literature and data on the effect of the COVID-19 pandemic on intravitreal treatment for AMD and the results of our study are consistent with the available data. In their letter to the editor, Timothy et al. [12] presented a 46% DNA rate for scheduled intravitreal injection clinic appointments for wet AMD. Reasons for non-attendance had been inquired from DNA patients and revealed 85% of DNA were due to fear of contracting the virus. Meanwhile, 98% of patients were not aware of the precautions that had been taken to prevent the spread of the virus and 71% would have attended if they had been informed beforehand of the precautions.

The article by Wasser et al. [14] demonstrated a greater reduction of intravitreal injection clinic attendance in comparison to the corresponding time periods in the previous four years. There had been a more than 50% reduction in attendance for intravitreal injections than expected for the particular time period.

Although the government announcement of lockdown did not apply to hospital care for life-threatening or sight-threatening conditions, a large percentage of these patients DNA'd. The trend towards failure to attend had begun even before the lockdown. This was possibly because lockdown was preceded by a general advice on avoidance of non-essential travel, cancellation of all school trips and advice to avoid crowded

areas, further compounded by the announcement of cancellation of elective NHS activity [2,3].

Patients' unawareness of the normal running AMD clinics could have been a reason for the high DNA rate. Reluctance to attend an acute hospital which already housed COVID-19 patients may have been an additional factor due to the fear of acquiring a nosocomial disease. Following the peak of non-attendance at week two of lockdown, all patients were telephoned by our AMD coordinators to ensure that they were willing to attend. Patients were informed of the steps taken by the hospital to minimise virus transmission. These included use of Level 1 personal protective equipment (PPE) [15] by staff, staggered appointments to ensure social distancing and no face-to-face clinical examination, instead opting for virtual decision-making based on VA and optical coherence tomography (OCT) assessment alone for all follow-up patients. Clinical examination was restricted to new patients and only those patients who expressed a desire to attend were offered an appointment. Patients who did not want to attend were retained on a holding list. The DNA rate did come down, however, despite these measures, 35-40% of patients still did not attend.

The study had some limitations that should be considered when interpreting the results. This was a single centre study and, therefore, the disease prevalence and severity of COVID-19 in a particular region would have had an impact on attendance rate. Furthermore, the relatively short time period for consideration and small sample size may have influenced the findings.

Conclusion

While taking necessary steps such as shielding and avoiding non-essential travel helps to prevent the risk of catching COVID-19, the potential collateral damage caused by individuals failing to undergo sight-saving treatment must not be underestimated. Prior communication with patients explaining the steps taken by the department to minimise risk to both patients and staff, and emphasising the importance of regular attendance to prevent visual deterioration, may help in reducing the DNA rate.

We plan to extend this study to survey all patients who DNA'd during the period, exploring their reasons for failing to keep their appointment. This might help with planning for steps to mitigate non-attendance, for example, through patient education, in the event of a second wave. We also plan to analyse the long-term impact on the visual status of those who continued to attend during the COVID-19 pandemic

TAKE HOME MESSAGE

"Almost half of patients (45.7%) failed to keep their scheduled appointments, suggesting that there may have been an inherent fear of visiting a hospital where active COVID-19 patients were present"

versus those who missed their appointments. Furthermore, future research may be required to determine why patients with good VA in the treated eye were more likely to attend than those with poorer vision in the treated eye.

As the pandemic continues to evolve, management plans need to be put in place to improve attendance, perhaps by shifting intravitreal treatment clinics to the community or to a COVID-19 green setting. Despite the need to preserve vision, ultimately the safety and survival of our elderly population must remain our utmost priority.

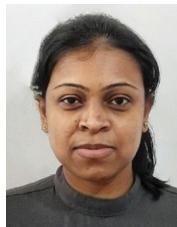
References

1. Weekly Epidemiological Update. World Health Organization. 11 October 2020:1-28. <https://www.who.int/docs/default-source/coronavirus/situation-reports/20201012-weekly-epi-update-9.pdf>
2. Gov.uk. Prime Minister's statement on coronavirus (COVID-19); 16 March 2020. <https://www.gov.uk/government/speeches/pm-statement-on-coronavirus-16-march-2020>
3. Ezalia E, RIE, Elizabeth G, et al. Urgent next steps on NHS response to COVID-19 letter Simon Stevens. *Orphanet Journal of Rare Diseases* 2020; **21**:1-9.
4. RCOphth: Management of Ophthalmology Services during the Covid pandemic: <https://www.rcophth.ac.uk/wp-content/uploads/2020/03/RCOphth-Management-of-Ophthalmology-Services-during-the-Covid-pandemic-280320.pdf>
5. Chodosh J, Holland GN, Yeh S. Important coronavirus updates for ophthalmologists. American Academy of Ophthalmology, CDC, WHO; 23 March 2020. <https://www.aoa.org/headline/alert-important-coronavirus-context>
6. Royal College of Ophthalmologists. Medical Retinal Management Plans during COVID-19, 2020. <https://www.rcophth.ac.uk/wp-content/uploads/2020/03/Medical-Retinal-Management-Plan-during-COVID-19-UPDATED-300320-1-3.pdf>
7. Liu K, Chen Y, Lin R, Han K. Clinical features of COVID-19 in elderly patients: A comparison with young and middle-aged patients. *J Infect* 2020; **80**(6):e14-8.
8. The American Society of Retina Specialists. COVID-19: Updates and Resources. <https://www.asrs.org/practice/asrs-member-alert-regarding-covid-19-pandemic>
9. Morelli N, Rota E, Terracciano C, et al. The baffling case of ischemic stroke disappearance from the casualty department in the COVID-19 era. *Eur Neurol* 2020; **83**(2):213-5.
10. Tam CC, Cheung KS, Lam S, et al. Impact of coronavirus disease 2019 (COVID-19) outbreak on ST-segment-elevation myocardial infarction care in Hong Kong, China. *Circulation: Cardiovascular Quality and Outcomes* 2020; **13**(4):e00663.
11. Wong LE, Hawkins JE, Murrell KL. Where are all the patients? Addressing Covid-19 fear to encourage sick patients to seek emergency care. *NEJM Catalyst Innovations in Care Delivery* 14 May 2020.
12. Fung THM, Kuet ML, Patel MK, Puri P. Addressing COVID-19 fear to improve clinic attendance for patients with wet age-related macular degeneration. *Acta Ophthalmol* 2021; **99**(2):e285.
13. Antaki F, Dirani A. Treating neovascular age-related macular degeneration in the era of COVID-19. *Graefes Arch Clin Exp Ophthalmol* 2020; PMID:32318805
14. Wasser LM, Weill Y, Brosh K, et al. The Writing On The Wall Intravitreal Injection Compliance During The COVID-19 Pandemic and Its Foreseeable Consequences. *Research Square* 6 August 2020.
15. Health Protection Scotland. Appendix 16 – Best Practice – Aide memoire for Levels of Personal Protective Equipment (PPE) for Healthcare Workers when providing patient care, 2020. <http://www.nipcm.hps.scot.nhs.uk/media/1437/2019-02-11-aide-memoire-for-levels-of-personal-protective-equipment-ppe-for-healthcare-workers-for-patient-care.pdf>

(All links last accessed April 2021)

- AMD-related sight loss and COVID-19 related increased morbidity and mortality predominantly affects elderly population.
- How lockdown measures affected AMD care and whether patients' demographics have any influence on AMD clinic attendance was evaluated.
- The non-attended group was significantly older, while patients who received treatment for both eyes and patients who had good visual acuity of treated eye in one eye treated group were more likely to attend.
- Meanwhile, gender and visual acuity of untreated fellow eye did not show an effect on the attendance rate.
- The COVID-19 outbreak has caused a significant drop in AMD clinic attendance and various strategies should be identified to encourage clinic attendance for sight threatening conditions as the pandemic continue to evolve.

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Declaration of competing interests: None declared.