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Title:

Eye movement control after COVID-19 disease: a pilot study

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Poster [ ] Oral presentation [X]

Abstract body
Please include four distinct parts with the following headers: **Purpose, Methods, Results** and **Conclusions.**

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Purpose: A number of studies have reported neurological deficits and affectations resulting from COVID-19 disease including altered mental status, cerebrovascular events, new onset or breakthrough seizures, headaches as well as cognitive abnormalities [1-3]. While it is well established that eye movement control is impaired in multiple neurological and neurodegenerative conditions [4-7], the impact of COVID-19 disease on eye movements is still unknown. This pilot study aims to investigate possible differences in oculomotor function and control in individuals who suffered COVID-19 disease and individuals who have not suffered this condition.

Methods: Participants with a confirmed diagnosis of COVID-19 with a PCR test or alternative diagnostic test who were symptomatic during the acute phase and recovered 12 months prior to the study were recruited (n=26). Control participants who had not previously tested positive for COVID-19 were also recruited (n=13). An initial screening optometric and ophthalmic assessment was conducted to exclude any participants with obvious optometric deficits that could affect the eye movement recording procedures. Following this, eye movements were recorded binocularly using the EyeLink 1000 while participants conducted three visually guided saccadic and anti-saccadic tasks (gap, overlap and Posner paradigms), horizontal and vertical smooth pursuit (following two motion paradigms: sinusoidal and constant velocity), and a fixation stability task. Latencies and gains for saccades and anti-saccades were obtained. For smooth pursuit and fixation, the number and mean amplitude of saccades during each task were obtained. Finally, fixation quality during the fixation task was assessed by calculating the mean eye position and the standard deviation of the mean eye position.

Results: A total of 31 participants demonstrated good visual acuity and binocularity in the initial optometric assessment, and successful eye movement recordings were obtained from 28 of these participants (COVID n= 20, age 50.66±SD5.32; Control n=8, age 45.02±SD9.52). Early analysis revealed that while pro-saccadic and anti-saccadic gains are similar between groups, there is a tendency for increased latencies in participants who suffered COVID-19 disease compared to controls. This increase in latencies is more significant for the anti-saccadic tasks. Preliminary results also suggest a tendency for a reduced fixation quality in participants who suffered COVID-19 disease compared to controls.

Conclusions: The results of this pilot study suggest that COVID-19 may have an impact on eye movement function and control, and this may persist over time. These findings highlight the need for further research to understand these COVID-19 additional affectations and their link to cognitive abnormalities.

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List references in order of appearance and use ref. number in square brackets to cite them in the abstract body.

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