Differences in gaze behavior and task performance in patients with homonymous visual field defects (HVFDs)

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INTRODUCTION

To assess the visual performance of patients with homonymous visual field defects (HVFDs), we used two visual tasks under virtual reality conditions.

1st task: Dot Counting ➔ DC (introduced by Zihl, 1995; cf. Tant et al., 2002)
2nd task: Comparative Visual Search ➔ CVS (cf. Pomplun et al., 2001)

Questions: Do all patients show the same task/gaze performance? Do the patients’ performances differ between the both tasks? Where are the differences compared to healthy subjects?

MATERIAL & METHODS

APPARATUS: - Curved, tilted, conical projection screen - enables a large fov of 150° x 70° (horizontal x vertical)
- Subjects sat in 1.62 m screen distance, eye level at 1.2 m
- Eye movement recordings with the head mounted ASL-501 tracker
- Head movement recordings (fido) with the infrared based system ART/track

DC- Task: 20 randomly arranged dots; presented 3 times
- stimulus size: 60° x 40°

CVS - Task: Two cubicles filled with geometrical objects in four colors - Objects’ configuration was identical except for 0, 1 or 2 target positions, where only the objects’ shape was different

RESULTS I

Patients’ Task Performance

- Median Splitting to divide the patients for each task into two subgroups
- Subgroups were identical for each task

Task Performance Comparisons

Healthy subject
- regular, systematic scanning pattern
- accumulation of several dots into one functional group (DC-Task)
- good balance between speed and safety

HVFD- Patient
- irregular, detailed and time consuming scanning pattern
- conspicuous scanpaths with a high number of refixations
- short saccadic amplitudes

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RESULTS II

Gaze Performance Comparisons

DC-Task: Findings of Zihl (1995) and Tant et al. (2002) could be confirmed - HVFD patients performed just as well as unimpaired subjects.

CVS task: HVFD patients showed adaptive performance compared with controls regarding number of fixations.

Both tasks: For the majority of gaze characteristics - HVFD patients performed worse than all other subjects.

CONCLUSIONS

- HVFD patients’ collective could be divided into two subgroups based on their task performance.
- Overall, HVFD patients showed no differences compared with healthy control subjects.

REFERENCES


This work was supported by the Deutsche Forschungsgemeinschaft (Graduiertenkolleg 778 and grant 3G731-1 awarded to S.G.) and the European Commission (6th FP NEST-Pathfinder Project ‘Wayfinding’).