INTRODUCTION

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

First Task: Dot Counting (DC) (introduced by Zihl, 1995;cf. Tant et al., 2002)

Second Task: Comparative Visual Search (CVS) (cf. Pomplun et al., 2001)

Questions: Show all patients the same visual performance?
Are the patients’ performances different between the both tasks?

MATERIAL & METHODS

APPARATUS: - Curved, tilted, conical projection screen - enables a large field of view (fov) 150° x 70° horizontal-vertical
- Subjects sat in 1.62m distance, eye level at 1.2m (Figure 1)
- Eye movement recordings with a head mounted, infrared light based eye tracker (model: ASL-501).
  - Head movement recordings (6dof) with the infrared based system ARTtrack
  - Sample rate of both systems: 60 Hz
  - Measured gaze position with an error of about ±0.5° of visual angle

SUBJECTS: - 9 HVFD patients (4 females, 5 males; age: 21-70 years)
- 7 healthy controls (5 females, 2 males; age: 28-81 years)

STIMULI - DC: - 20 randomly arranged dots (60°×40° fov) presented 3 times
  - dots appeared after a initial center fixation phase (5 seconds long)
- TASK: Count the number of dots silently and report the result!

STIMULI - CVS: - Two cupboards filled with geometrical objects in four colors
  - Cupboards included each 20 objects; Distance between them: 60° (Figure 1)
  - Eye movement recordings with a head mounted, infrared light based eye tracker (model: ASL-501).
  - Objects’ configuration was identical except for 0, 1, or 2 target positions, where the objects’ shape was different
  - cupboards appeared after a initial center fixation phase (5 seconds long)
- head and eye movements allowed

TASK: Find the number of differences (as quick and reliable as possible)!

CONCLUSIONS

- HVFD patients’ task performance divided these into two groups with different visual performances.

- Overall, BM-patients’ group showed no differences compared with healthy control subjects related to the task performance.

- AM-patients performed the both tasks worse than control subjects.

- BM-patients showed worse overall visual performance compared with controls for the more complex visual search task (CVS).

RESULTS

- Median split method divides HVFD-patients into two groups: 7 BM-Patients and 2 AM-Patients
- Same patient groups obtained in both tasks
- Patients in the AM group have a hemianopic field defect
- BM group contained 5 quadrantanopia and 2 hemiopic scotoma patients

Comparative fixational gaze behavior

Further gaze behavior parameter

REFERENCES


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