PAREIDOLIAS AND CREATIVITY IN PARKINSON'S DISEASE

Induced and constructed visual phenomena in Parkinson's disease

Hollenstein N ‡†, de Jong D ∂, Ide J ‡, Binder A ‡, Oechsner M ‡, Möller J.C ‡, Müri R ∂

‡ Center for Neurological Rehabilitation, Zihlschlacht, Switzerland
∂ University of Bern, Switzerland
† University of Zurich, Switzerland

CATEGORY
Disease Specific Rehabilitation 3

Introduction

Recently, it has been proposed that pareidolias may represent a prodrome of visual hallucinations in Parkinson`s disease (PD). Literature on this topic, however, is still scarce. Besides PD is characterized by a reduction of essential skills for creativity such as cognitive flexibility, conceptualization and visual-spatial perception. Nevertheless, individual case studies show an increase in creativity and a creative urge during PD progression.

Purpose

The aim of the present study was to investigate the type and prevalence of pareidolias in PD. Besides the relationship between visual creativity and PD was addressed.

Patients and Methods

A pareidolia test which has been designed to evoke both induced and spontaneous pareidolias and a creativity test for the measurement of constructed pareidolias (i.e., the creative visual production of ideas) were performed in 15 PD patients and 15 healthy controls. The PD sample included 6 patients with incipient dementia, 7 with visual hallucinations and 3 with deep brain stimulation.

Results

The healthy controls showed more induced pareidolias (correct answers - error 1) (Fig. 1) (Mann-Whitney-U-Test: U = 19.000, p = .025) while PD patients showed more spontaneous pareidolias (illusory responses - error 3 and error 4), especially those with incipient dementia (t(13) = -2.400, p =.032). Only a small non-significant difference in visual creativity between PD patients and healthy controls was observed.

Pareidolias

Because the results of the PD-specific groups (PD without/with hallucinations as well as PD without/with deep brain stimulation) do not differ significantly from one another, only the results of the PD group without dementia and the PD group with slight cognitive impairment are reported below (Fig. 2).

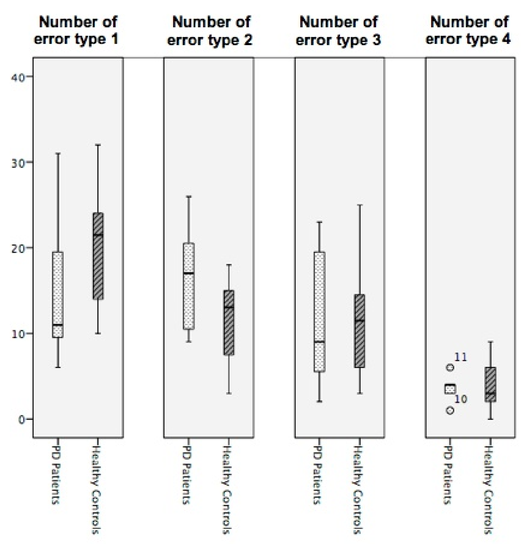

Figure 1: Comparison of PD patients and healthy controls in each error group.

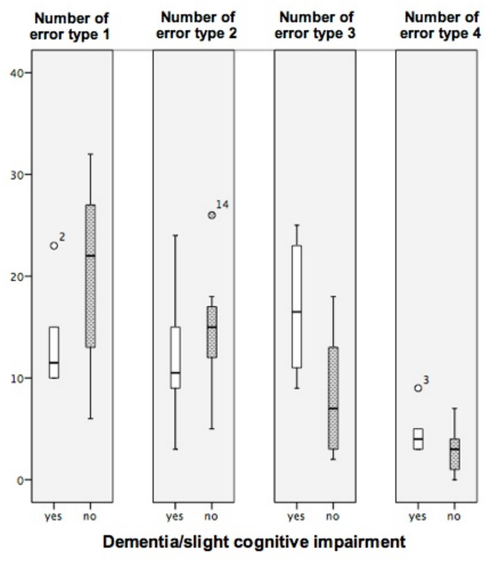

Figure 2: Comparison of PD patients with slight cognitive impairment and PD Patients without dementia.

Creativity

The individual subcategories of the drawn ideas and the number of ideas per image (with a total of three images) showed no differences in the results, accordingly the results of the two main groups, the number of ideas across all three images (VISUELL 1), and the number of different subspecies (VISUELL 2) are reported.
In addition, only the results of the PD disease group and healthy controls are shown, as the results of the PD-specific groups as well as the results of the PD disease group and the healthy control group do not differ significantly (Fig. 3).

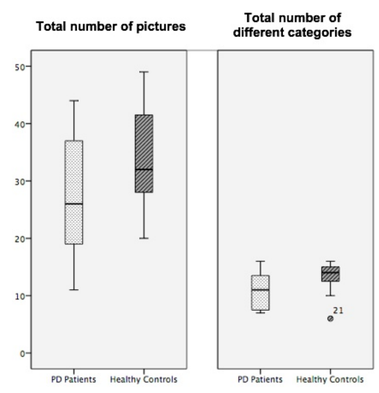

Figure 3: Comparison of PD patients and healthy controls in creativity.

Pareidolias and Creativity

There were no significant correlations and no trends in both groups with regard to the overall question. This shows that there is no link between the frequency of pareidolia and visual-creative tasks (Table 1).

Table 1: Correlations of particular errors of pareidolia testing and creativity of PD patients (n=15) and controls (n=15)

	PD Patients		Healthy Controls	
	VISUELL 1[a]	VISUELL 2[b]	VISUELL 1[a]	VISUELL 2[b]
Error 1	.175	-.089	-.075	.371
Error 2	-.071	.197	-.278	-.332
Error 3	-.124	-.049	.178	.000
Error 4	-.049	-.018	.404	-.076
Error 3+4	-.113	-.077	.268	-.036

Note. [a] Pearson-correlation; [b] Spearman rank correlation. VISUELL 1 = Number of produced ideas; VIUSELL 2 = Number of different categories of ideas.

Discussion and Conclusion

- Visual hallucinations in PD patients are a common problem in everyday clinical practice.
- The results of the present study suggest that pareidolias may be a predictive marker for future visual hallucinations.
- Furthermore, the results of this study indicate that spontaneous pareidolias may play an important role in the design of a test to detect future visual hallucinations, as is already known from other studies (Uchiyama et al., 2012; Uchiyama et al., 2015; Yokoi et al., 2014).
- It appears that especially the frequency of spontaneous pareidolias is different between PD patients (notably in PD patients with onset of dementia) and healthy controls. It should be noted that PD patients achieved an average response below the normal range during the Stroop task. This could be attributed to an increased response tendency (Hsieh et al., 2008) in pareidolia testing.
- Surprisingly, despite the significant motor impairment of PD patients, there was no difference in creativity. This suggests that creativity is an ability maintaining an average degree despite the reduction of neurocognitive performance.
- On the other hand, there was no correlation between the levodopa equivalence dose and the creativity dimensions. Previous studies have repeatedly demonstrated this relationship between dopaminergic treatment and increased creativity (Lhommée et al., 2014; Canesi et al., 2012; Shimura et al., 2012).
- Further studies seem warranted to investigate whether spontaneous pareidolias may be used as a predictor for visual hallucinations in PD. The apparently preserved visual creativity in PD patients may be interesting with respect to the employment of expressive therapies in these patients.

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Correspondence Address

Nathalie Hollenstein
Center for Neurological Rehabilitation
Hauptstr. 2-4
CH-8588 Zihlschlacht
Email: n.hollenstein@rehaklinik-zihlschlacht.ch