

The nose knows

Olfactory functioning in patients with neurological disorders

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Background

Olfactory disorders are associated with lower quality of life¹, depression² and anxiety³.

In the general population the prevalence of reduced olfaction is 22%⁴.

In neurological patient populations prevalence numbers vary from 34% in mild traumatic brain injury⁵ to >95% in specific neurodegenerative diseases^{6,7,8}.

In other neurological patient groups (e.g. stroke, epilepsy, brain tumors) olfactory functioning has hardly been studied.

Instruments

The Sniffin' Sticks Screening 12 Test⁹ was used to measure olfactory functioning.



The current study was embedded in a larger project on olfactory functioning in the neurological outpatient population, including multiple questionnaires about olfaction and psychological complaints.

Results

Figure 2
Raw score on Sniffin' Sticks Screening 12 Test

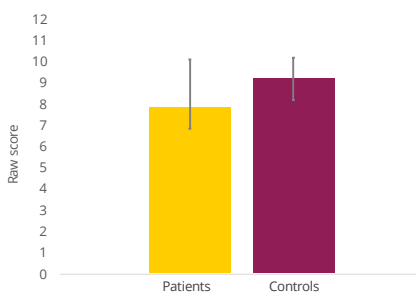
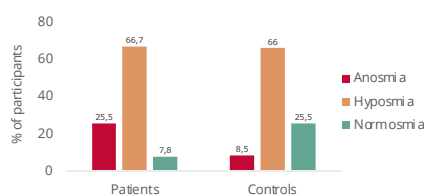


Figure 3
Categories of olfactory functioning based on screening test



Objectives

Central question

Does measuring olfaction in patients with neurological disorders have added value for clinical practice?



- Main objective: to map the prevalence of olfactory dysfunction in a broad neurological patient population
- Second objective: to compare olfactory functioning in the patient population with olfactory functioning in a control group



Results

An independent samples t-test showed that patients underperformed controls with a lower score on the olfactory screening test ($M=7.86$, $SD=2.27$) than controls ($M=9.21$, $SD=1.72$), $t(93)=-3.33$, $p=.001$ (see Figure 2). The effect size, as measured by Cohen's d , was $d=-.67$, indicating a medium effect.

A Mann-Whitney U test showed that categories of olfactory functioning, based on the screening test, were distributed differently in the patient group compared to the control group, $U=853$, $p=.003$ (see Figure 3). The effect size indicated a small effect, $r=-.297$.

A one-way ANCOVA showed a significant effect of group (patients vs. controls) on the olfactory screening test score after controlling for age, sex and education level, $F(1,93)=5.32$, $p=.023$. The effect size indicated a small to medium effect, $\eta^2=.054$.

Conclusions

- Patients with (possible) neurological disorders show worse olfactory functioning compared to the general population, regardless of age, sex and education level.
- Given the higher prevalence of olfactory disorders in this patient population, further research on the added value of measuring olfaction for clinical practice (e.g. differential diagnosis) is relevant.

Participants

Patient group: patients (18+) with a (possible) neurological disorder who have been referred to the outpatient clinic for a neuropsychological assessment

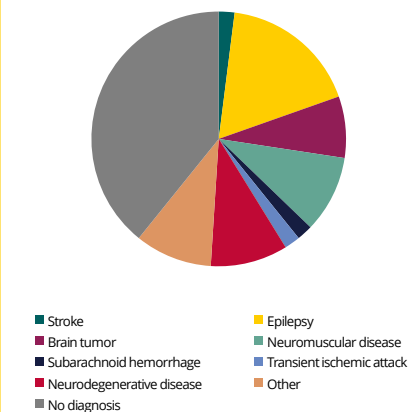
Control group: adults without neurological disorders, recruited in the general population

Table 1
Demographic features of patient group and control group

	Patients	Controls	P
N	51	47	
Age			
Range	19-92	20-90	
M (SD)	58.4 (17.3)	47.9 (20.9)	.007*
Sex			.009*
Female (%)	14 (27.5)	26 (55.3)	
Male (%)	37 (72.5)	21 (44.7)	
Education level			.054
Verhage 3-5 (%)	26 (51)	14 (29.8)	
Verhage 6-7 (%)	25 (49)	33 (70.2)	

* $p < .01$

Figure 1
Distribution of neurological diagnoses in patient group at time of follow-up with neurologist



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