

Olfaction and cognitive/behavioural impairment in amyotrophic lateral sclerosis

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Objectives

To evaluate the prevalence of **cognitive and behavioural impairment** and its relationship with **olfaction impairment** in amyotrophic lateral sclerosis (ALS) patients.

Patient and methods

Forty consecutive patients with clinical ALS diagnosis underwent an extensive **cognitive and behavioural assessment** and were classified according to Strong criteria. ALS patients and age-matched controls underwent modified **Sniffing's sticks olfactory tests** in order to evaluate odour identification, discrimination and verbal/visual association.

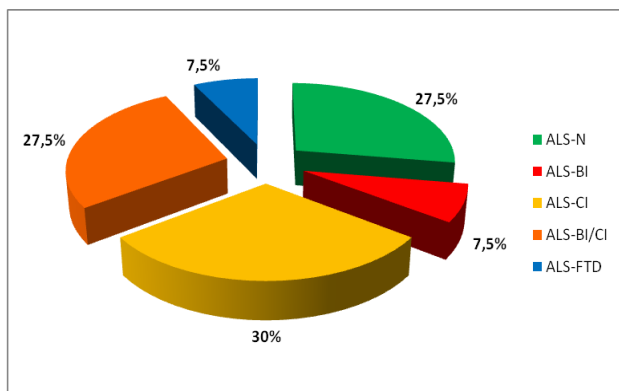


FIGURE 1: Classification of ALS patient according to Strong criteria (ALS-N= Normal Cognition, ALS-BI = Behavioral Impairment, ALS-CI = Cognitive Impairment, ALS-FTD=Frontotemporal Dementia)

Discussion

Our study confirmed the high prevalence of **cognitive and behavioural impairment** in ALS patients, still not fulfilling ALS-FTD criteria.

Hyposmia is common in ALS subjects and is mainly associated with **behavioural and cognitive impairment**.

Some patients presented an **odour semantic deficit** probably secondary to **prefrontal association areas damage** in ALS.

Results

Forty consecutive ALS patients entered the study (mean disease duration after diagnosis 7,2 + 11 months). Eleven patients (27.3%) were classified as **ALS-normal cognition (ALS-N)**, 3 presented **isolate behavioural impairment (ALS-bi)**, 12 **isolated cognitive impairment (ALS-ci)**, 14 **cognitive impairment associated to behavioural abnormalities (ALS-bi+ci)**, of whom n=3 fulfilled criteria for frontotemporal dementia, ALS-FTD).

Thirty four patients and 40 age-matched controls underwent the modified olfactory tests. **Nineteen** ALS patients (56%) showed **impaired olfaction** (p=0.001 vs controls).

Hyposmia was present in **20% of ALS-N** and **92% of ALS-bi, ALS-bi/ci and ALS-FTD**. Olfaction deficit correlated with presence of behavioural abnormalities (ALS-FTD Questionnaire, p=0.001) and lower global cognitive status (MMSE, p=0.008).

Five ALS patients presented **isolated odour semantic identification impairment**.

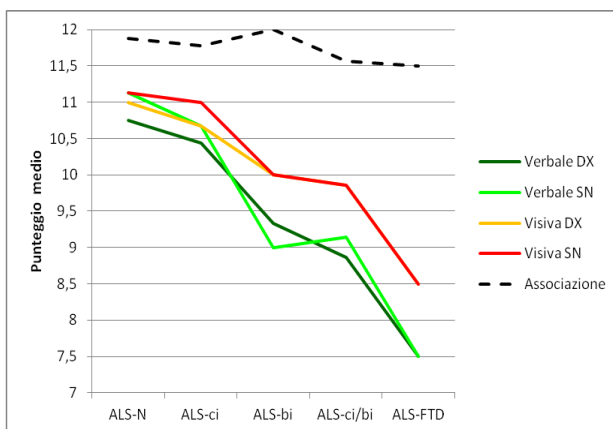


FIGURE 2: Olfactory deficit in different category of ALS patient

Conclusions

Olfaction deficit might be used as a screening of an underlying **cognitive and behavioural impairment** in ALS patients and deserves further larger investigations to assess its usefulness and reliability.