



Reward perception in subjects with hyposmia: which relationship with the development of Parkinson's Disease?



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Introduction

In Parkinson's Disease (PD) non-motor symptoms - such as hyposmia, sleep and autonomic dysfunction, mood and motivation disorders - precede motor impairment by decades, are described in almost all patients and hardly influence disability and quality of life.

Studies showed that smell dysfunction occurs in at least 90% of patients; because of its early, pre-motor, onset hyposmia has been studied as a biomarker of risk for developing of PD, being confirmed as the most accurate predictor, albeit limited in specificity.

In combination with other pre-motor symptoms such as motivation disorders, specificity of hyposmia as a predictor for PD could increase.

Methods

We included sixty-eight subjects with idiopathic hyposmia (38 females; mean age 58.3±8.3 years), who were evaluated at baseline with formal neurological and neuropsychological examinations and with Behavioral Inhibition/Behavioral Activation Scales (BIS/BAS). According to performance at BAS we stratified all subjects in tertiles. Everyone was then clinically re-evaluated after four years.

Results

Only 53 of the 68 subjects enrolled were available at follow-up after four years. Among them, eight developed Parkinson's Disease, with the following distribution according to baseline BAS tertiles: six in the lowest, two in the middle and none in the higher one.

Conclusions

Reward and goal-directed behaviour are thought to be dopamine-dependent striatal functions. Parkinson's Disease is a model of striatal impairment, dopaminergic pathways being mostly affected. Many studies investigated reward-processes in Parkinson's Disease, showing impairment in decision-making when a reward was proposed, even subclinically, unrelated to a defined apathy syndrome, mood or psychiatric disorders. Thus, it could be detected even years before the onset of motor disturbances in affected patients and relatives.

Discussion

We showed in a cohort of hyposmic people that subtle reward processing deficits were most represented when the risk to develop Parkinson's Disease was higher, as demonstrated by the onset of neurodegenerative disease in subjects with lower scores.

We offer a practical and easy screening tool to detect pre-clinical impairment to increase the specificity of hyposmia as a predictor of Parkinson's Disease, always in terms to reach pre-motor early diagnosis.

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