RASAGILINE AMELIORATES OLFACTORY DEFICITS IN AN OVER EXPRESSING A-SYNUCLEIN MOUSE MODEL OF PARKINSON’S DISEASE

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Introduction: Impaired olfaction is an early non-motor symptom of Parkinson’s disease (PD). The neuropathology underlying this impairment is unknown, but is likely to involve α-synucleinopathy in the olfactory bulb (OB) and/or a reduction in OB neurogenesis.

Anecdotal reports suggest that rasagiline, an irreversible monoamine oxidase inhibitor, which is used as monotherapy in early stage PD and as an adjunct to levodopa in moderate to advanced stages, can improve olfaction in PD patients.

We therefore used a novel transgenic mouse model of PD that overexpresses human wild-type α-synuclein and displays olfactory deficits, in order to investigate whether rasagiline could rescue these deficits.

Aim: To determine whether rasagiline can ameliorate olfactory deficits in a mouse model of PD.

Methods: We treated transgenic mice over-expressing human wild-type α-synuclein under the control of the partial mouse α-synuclein promoter with rasagiline (3 mg/kg in drinking water) for 8 weeks and compared them to untreated control mice. We utilized multiple olfactory function tests, including odour detection and discrimination tests, and a short-term olfactory memory test.

Results: Rasagiline treatment significantly improved the odour detection ability and normalised deficits of social/non-social odour discrimination in these mice. However, rasagiline effect did not affect short-term olfactory memory changes.

Conclusions: Rasagiline reverses deficits in olfactory function in a novel transgenic mouse model of PD. These findings correlate with anecdotal clinical observations and support a role for rasagiline in ameliorating olfactory deficits in PD patients. Further investigations are warranted to determine the effect of rasagiline on OB α-synucleinopathy and/or OB neurogenesis.