Sevoflurane may not affect the survival in a *Drosophila* Parkinson's disease model

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Introduction:

Parkinson's disease (PD) is the 2nd common neurodegenerative disease in about 1% of elderly population over 60 years of age [1]. Some evidences suggested that inhalational anesthetics could damage neurons and may be a potential link to some neurodegenerative diseases, such as PD [2-5]. Therefore, we use sevoflurane, the most commonly used inhalational anesthetic, on the overall survival in PD-transgenic *Drosophila*.

Methods:

We used 20-day-old PD-transgenic male flies (genotype: *elav*-Gal4>UAS-α-synuclein) and control male flies (genotype: *elav*-Gal4>+ and UAS-α-synuclein>+) (n=6). Control and PD-transgenic flies were anesthetized with 2.1% sevoflurane plus 100% oxygen for 16 times exposure (1 hour per time). The flies were maintained at a density of 35 per vial, at 25℃ in 50 to 60% relative humidity under a 12-h light:12-h dark (LD) cycle, and transferred to new food every 3 or 4 days until all PD transgenic male flies dead [9].

Results:

The survival of PD-transgenic flies was significantly lower than control flies on day 50 after eclosion (Fig. 1, $p<0.05$). Exposure of 2.1% sevoflurane for 16 times did not attenuate the lifespan of control flies and PD files (Fig. 1).

Conclusions:

We found that sevoflurane in clinically relevant concentrations might not affect the overall survival of control and PD-transgenic flies. This suggests that sevoflurane might not have long-term neurotoxic effects. Stratmann *et al.* demonstrated that no cognitive deficit 4 months after anesthetic treatment in aged rats [10] and others showed that inhalational anesthetics have neuroprotective effects [11, 12]. Therefore, general anesthesia with sevoflurane might be still effective and safe in clinical practices including patients with PD.

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Figure 1.