Investigation to detect of traces of methimazole in the urine of owners of hyperthyroid cats

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Introduction

Hyperthyroidism is the most common feline endocrine disease.

Methimazole and its prodrug are potential teratogens → careful handling by owners is mandatory but not always respected.

Cats often live in close contact with their owners → exposure to anti-thyroid drugs?

AIM: to evaluate the presence of traces of methimazole in the urine of owners of hyperthyroid cats treated with antithyroid drugs.

Methodology

Prospectively recruited medically treated hyperthyroid cats presented at the Small Animal Clinic and at one private veterinary practice.

Five humans treated with anti-thyroid drugs and five humans without exposure to anti-thyroid drugs = positive and negative control groups.

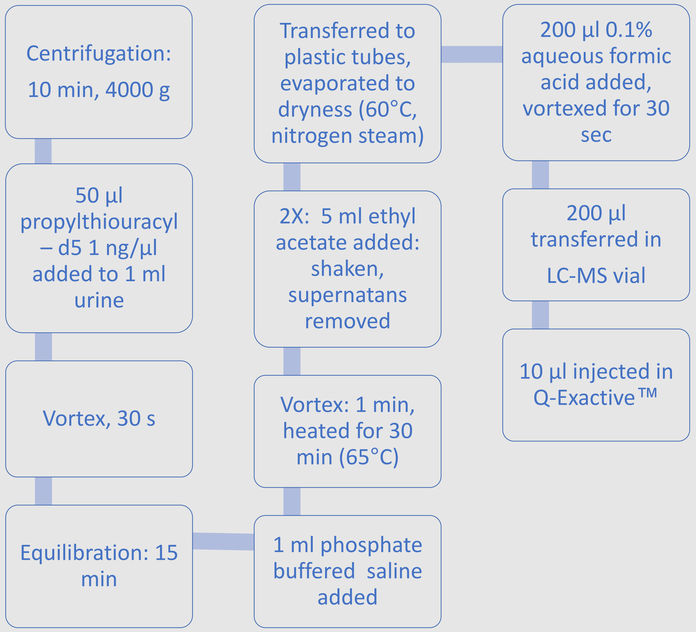
Informed consent.

Urine collected at home (non-absorb cat litter), frozen at -20°C in 24 hours following collection.

Chromatographic separation Dionex UltiMate 3000 XRS UHPLC system (Thermo Fisher Scientific, San Jose, CA, USA), equipped with Acquity HSS T3 C18 column (1.8 mm, 150 x 2.1 mm) (Waters, Manchester, UK).

Detection Q-Exactive™ standalone bench top quadrupole-Orbitrap high-resolution mass spectrometer (Thermo Fisher Scientific, San Jose, CA, USA), preceded by heated electrospray ionization (HESI-II source) in positive ionization mode.

Targeted data processing Xcalibur 3.0 software (Thermo Fisher Scientific, San Jose, CA, USA).



Results

24 owners were included:

- 22 were living in close contact with their cat
- 21 were the main responsible for administration of medication
- 16 were the main responsible for cleaning the litter box
- 2 were splitting tablets, without gloves
- 2 were using gloves, 1 finger cots

23 cats were included:

- 12 were treated with syrup
- 11 were treated with tablets
- Treatment = one week to > 5 years
- 14 were mainly indoor cats

High concentrations of methimazole were detected:

- in all feline samples: mean concentration 4952.18 ng/ml (range 103.73 – 15143.00 ng/ml) .
- in urine of positive control group: mean concentration 3665.78 ng/ml (range 1827.74 - 5178.45 ng/ml).

No traces of methimazole were detected:

- in urine of owners of hyperthyroid cats.
- in urine of negative control group.

Discussion and conclusion

No traces of methimazole were detected in the urine of owners of hyperthyroid cats treated with antithyroid drugs → rather reassuring regarding potential exposure owner.

Prudence is still warranted: the use of methimazole during pregnancy is associated with increased risk of congenital abnormalities, which can be severe → importance of prudent handling of antithyroid medication, especially by pregnant women/women who may become pregnant.

Cats treated with transdermal application of methimazole gel were not included → protection with gloves/finger cots is mandatory but it is unknown in which measure these guidelines are followed → **these results can probably not be extrapolated to the use of transdermal application.**

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