

## P01

### High exposure to anesthetic is associated with DNA damage and apoptosis in veterinarians

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Inhalational anesthetics are routinely used worldwide for general anesthesia in both humans and animals. Therefore, health care professionals who work in operating rooms have occupational exposure to waste anesthetic gases, which may be associated with toxic effects. Considering the lack of studies in veterinary professionals, this is the first study to monitor trace concentrations of anesthetic and evaluate genetic instability and apoptosis in veterinarians. After approval from the ethical committee, questionnaires were applied and written informed consent was obtained from veterinarians exposed to the anesthetic isoflurane (exposed group) and from volunteers without occupational exposure (control group). Biological samples were collected and blinded analyzed for cytokinesis-block micronucleus (MN) assay for evaluation of DNA damage; viability and apoptosis in lymphocytes (CD3+) were detected by flow cytometry; and urine samples were analyzed by gas chromatography-mass spectrometry for isoflurane trace concentrations as internal marker of exposure (biological monitoring). In addition, air samples from veterinary operating rooms were measured by infrared analyzer to detect isoflurane trace concentrations (environmental monitoring). Both groups were similar regarding demographic and anthropometric data ( $p > 0.05$ ). Regarding the urinary concentration of isoflurane in the exposed group, an average of  $26 \pm 24 \mu\text{g/l}$  urine was found; as expected, no isoflurane was detected in urine samples from the control group. Environmental monitoring showed  $10 \pm 8 \text{ ppm}$  of isoflurane in veterinary operating rooms (considered above the international limit). The exposed group had a higher frequency of MN ( $p = 0.04$ ) and apoptosis (annexin+/7-AAD-;  $p = 0.044$ ) than control group whereas the control group had a higher frequency of viable cells ( $p = 0.017$ ) than exposed professionals. In conclusion, high levels of trace concentrations of isoflurane in urine and workplace are associated with DNA damage and apoptosis in lymphocytes. Therefore, the findings highlight the need to mitigate anesthetic pollution in the work environment to reduce occupational exposure in professionals who work in veterinary operating rooms to minimize the impact of anesthetic toxicity.

#### Funding:

FAPESP and CNPq

#### Keywords:

Occupational exposure; isoflurane; veterinarians; micronucleus; cytotoxicity