

Using telemetry to automate the detection of emesis in the ferret: New vistas for delayed emesis assessment.

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J Pharmacol Toxicol Methods, 68 160-165, 2013.

 <http://www.ncbi.nlm.nih.gov/pubmed/23578691>

Abstract

INTRODUCTION:

Nausea and vomiting are common side effects of cancer chemotherapy. The ferret is a highly appropriate animal species to evaluate both early and delayed emetic events occurring hours and days after administration, respectively. If early emesis can be easily investigated in ferrets by direct observation, alternative methods are required to quantify delayed emesis. This study was designed to validate a new method of automated detection of abdominal pressure changes related to retches or vomits induced by a cytotoxic substance in the ferret.

METHODS:

Five ferrets implanted with telemetry devices (Data Sciences International) were challenged with cisplatin (8 mg/kg, i.p.) and abdominal pressure was recorded in unrestrained animals for 72 h. The pressure signals were analyzed both manually and automatically using an adapted version of ecgAUTO software (Emka Technologies). Over the first 3 h, the emetic response was also quantified via direct observation of the animals. The data produced by the 3 methods of detection were compared using a Spearman's rank correlation coefficient.

RESULTS:

Visual, manual and automated detections of early emetic events over the first 3-hour recording period were well correlated when compared per 30-, 15- or 5-minute epoch: correlation coefficients ranging from 0.8640 to 0.9289, $p < 0.0001$ for all comparisons. Manual and automated detections of early and delayed emetic events over the 72-hour recording period were also well correlated when compared per 3-hour epoch: correlation coefficient=0.9190, $p < 0.0001$.

DISCUSSION:

These findings demonstrate that automated detection of abdominal pressure changes with adapted software is a reliable method for measuring emetic events in the ferret. The results obtained open major possibilities for the rapid, comprehensive and objective analysis of delayed emesis. They should thereby facilitate the development of novel chemotherapeutic agents and anti-emetic therapies.