RESEARCH PAPER

Assessment of the variation in American Society of Anaesthesiologists Physical Status Classification assignment in small animal anaesthesia

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Abstract

Objective To evaluate the interobserver variability in the assignment of the American Society of Anesthesiologists Physical Status Classification (ASA-PSC) to compromised small animal patients amongst a group of veterinary anaesthetists.

Study design Anonymous internet survey.

Animals Hypothetical case presentations.

Methods Sixteen hypothetical small animal cases with differing degrees of physiological or pathophysiological compromise were presented as part of an internet survey. Respondents were asked to assign a single ASA-PSC to each case and also to answer a number of demographic questions. ASA-PSC scores were considered separately and then grouped as scores of I–II and III–V. Agreement was analysed using the modified kappa statistic for multiple observers. Data were then sorted into various demographic groups for further analysis.

Results There were 144 respondents of which 60 (~42%) were anaesthesia diplomates, 24 (~17%) were post-residency (nondiploma holders), 24 (~17%) were current anaesthesia residents, 21 (~15%) were general practitioners, 12 (~8%) were veterinary nurses or technicians, and 3 (~2%) were interns. Although there was a majority agreement (>50% in a single category) in 15 of the 16 cases,

ASA-PSC were spread over at least three ASA-PS classifications for every case. Overall agreement was considered only fair ($\kappa = 0.24$, mean $\pm$ SD agreement $46 \pm 7\%$). When comparing grouped data (ASA-PSC I–II *versus* III-V) overall agreement remained fair ($\kappa = 0.36$, mean $\pm$ SD agreement $69 \pm 19\%$). There was no difference in ASA-PSC assignment between any of the demographic groups investigated.

Conclusions and clinical relevance This study suggests major discrepancies can occur between observers given identical information when using the ASA-PSC to categorise health status in compromised small animal patients. The significant potential for interobserver variability in classification allocation should be borne in mind when the ASA-PSC is used for clinical, scientific and statistical purposes.

Keywords American Society of Anesthesiologists, health, interobserver variability, physical status, pre-anaesthetic assessment, scoring systems, status.

Introduction

The American Society of Anesthesiologists (ASA) Physical Status Classification (ASA-PSC) is an ordinal rating scale used to categorise the health status of a patient prior to undergoing anaesthesia. The ASA-PSC was originally devised in 1941 by a committee of the ASA assigned the task of developing a system for the collection and tabulation of

statistical data in anaesthesia (Saklad 1941). The intention was that this system could be used for anaesthetic record keeping under any circumstance and subsequently for the retrospective evaluation of anaesthesia and surgical procedures. One of the variables to be considered by this committee was termed 'operative risk'. The conclusion made was that 'operative risk' could not be calculated and that patient's were best classified based upon their physical status only (Saklad 1941). Consequently, the ASA-PSC was developed and later ratified by the ASA (Anon 1963).

The ASA-PSC classifies a patient based on simple descriptors of their current health status and was designed to have no relation to the type of surgical procedure, the experience or ability of the anaesthetist or surgeon, or the anaesthetic technique being used. The ASA-PSC has been modified a number of times since the original description but currently contains six categories (American Society of Anesthesiologists 2010), the first five of which are relevant for veterinary anaesthesia (Table 1).

Despite being widely used and accepted, a lack of interobserver agreement in the assignment of ASA-PSC to human patients has been suggested by a number of studies (Owens et al. 1978; Haynes & Lawler 1995; Ranta et al. 1997; Mak et al. 2002; Ragheb et al. 2006; Burgoyne et al. 2007; Cuvillon et al. 2011). Agreement has been found to be at best moderate and at worst poor. The variability observed was most profound in compromised patients with co-existing or complicated disease processes.

The purpose of this study was to evaluate the interobserver variability in ASA-PSC assignments in compromised small animal patients within a group of veterinary anaesthetists with varying experience and qualifications.

Materials and methods

The study was approved by the local ethics and welfare committee as part of a larger study proposal (QVS/CR41).

Sixteen hypothetical small animal surgical cases were compiled, heavily based upon real cases presented to the authors' institution. Small alterations and omissions were generally made from the real life scenario in order to simplify and shorten each case summary. Each case had a degree of physiological or pathophysiological compromise or a complicating factor that the authors felt could influence risk or outcome. These included upper airway disease, trauma, extremes of age, obesity, stabilised emergency cases and chronic controlled medical conditions such as diabetes mellitus and congestive heart failure.

Each case summary was composed of three parts; firstly the animal's signalment and the proposed procedure, secondly a brief clinical history, and finally a pre-anaesthetic assessment which included physical examination findings. Results of relevant diagnostic tests were reported on a case by case basis in the pre-anaesthetic assessment section. The case summaries are reported in Appendix S1 (Supporting Information).

All questions had to be answered with a single ASA-PSC score. An additional free text box was supplied in order to assign the emergency 'E' classification where necessary. All responses were anonymous but a number of demographic questions were posed. These included the respondent's age, gender, current professional status and the sector in which they worked.

The survey was hosted via an online survey builder (http://www.kwiksurveys.com/). Links to the survey were posted on the American College of Veterinary Anesthesiologists electronic mailing list (ACVA-L), the Association of Veterinary Anaesthetists (AVA) website (http://www.ava.eu.com/) and emailed to AVA members.

Prior to the online launch of the survey, each case summary was trialed on a group of six independent assessors to ensure that each presentation remained realistic, that there was no ambiguity or error, that the data were presented in a clear and concise manner and that sufficient information was provided in order to make an informed assessment. The

Table 1 The current ASA Physical Status Classification system as published in the ASA relative value guide, 2010

ASA Physical Status I – A normal healthy patient
ASA Physical Status II – A patient with mild systemic disease
ASA Physical Status III – A patient with severe systemic disease
ASA Physical Status IV – A patient with severe systemic disease that is a constant threat to life
ASA Physical Status V – A moribund patient who is not expected to survive without the operation
ASA Physical Status VI – A declared brain-dead patient whose organs are being removed for donor purposes *(this category can be considered redundant for the purposes of veterinary anaesthesia)*