Pregeneral anaesthetic blood screening of dogs and cats attending a UK practice

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PREGENERAL anaesthetic (pre-GA) blood tests are often recommended for high risk or elderly pets. Screening can sometimes alter the American Society of Anaesthesiology (ASA) classification for a patient and subsequently clinical decisions relating to anaesthesia protocol (Joubert 2007); however, routine blood screening is not recommended by most authors (Silverstein and Boland 1994, Alef and others 2008, Apfelbaum and others 2012).

This study was conducted to determine the value of pre-GA blood tests for companion animals attending a veterinary group practice in the UK. The hypothesis was that pre-GA blood screening results would show abnormalities that would help identify anaesthetic risks for patients.

A retrospective review was conducted of all canine and feline pre-GA blood profile test results generated by the Scarsdale Veterinary Group Laboratory in Derby between October 2010 and September 2012. The Group uses a computerised practice management system which stores coding specifically for a ‘Lab Pre-GA profile’ and these entries were extracted by interrogating the linked laboratory database. The pre-GA profile is a redacted version of a full profile, and consists of 15 tests (see Table 1). Associated case clinical records were also accessed on the practice computer management system.

A total of 7039 test results from 474 dogs (mean age 9.64 years) were recorded and 5730 (81.4 per cent) were within the reference range. Twenty-five (5.27 per cent) of dogs had a panel of results all within their reference ranges. In all, 102 dogs (21.51 per cent) did not proceed to general anaesthesia for a variety of reasons and in 39 (8.23 per cent) the clinician recorded concern about the blood test results. The general anaesthetic protocol was documented to have been changed due to abnormal blood tests for 19 (4 per cent) of dogs. The results for individual tests are shown in Figs 1–3.

Throughout the period of this retrospective study, clinicians were not routinely recording ASA statuses or how much the ASA status changed based on the laboratory findings. In the canine study reported by Joubert (2007), a total of 30 new diagnoses were made in 101 elderly dogs (29.7 per cent) and of these 13 (12.87 per cent) did not undergo anaesthesia as result of the new diagnosis. This is a much higher proportion of cases than reported in this study; however, in Joubert’s study, screening involved a full history, physical examination and urinalysis in addition to blood tests and the mean age of dogs was greater (10.99 years).

While pre-GA blood screening was of no clinical value for the majority of patients included in this study, abnormal blood results were documented as a matter of concern for clinicians in 8.25 per cent and 15.77 per cent of dogs and cats respectively and in almost 1 per cent it identified problems not recognised from the history or physical examination. As a result, there was modification of anaesthetic protocol in 4 per cent dogs and 9 per cent cats and postponement of surgery in some cases. Preanaesthetic blood screening is therefore a valuable aid in the management of animals undergoing general anaesthesia.

It would be advantageous if clinicians could routinely record ASA grades for patients undergoing general anaesthesia.

In seven of the 772 cases (0.9 per cent) blood results indicated an unsuspected problem: four had elevated alkaline phosphatase subsequently shown in three to be associated with hepatic disease, and two high urea, one due to chronic kidney disease, the other of unknown cause.

This study used data relating to blood tests specified as being a pre-GA profile in the practice management database. Animals that had a full blood profile or selected blood tests done as part of the diagnostic workup were excluded, so this study does not represent the total number of blood tests done prior to anaesthesia. In addition, the decision to have a pre-GA blood screen is optional for pet owners and many do not agree to have it done, so this study does not include all anaesthetised cases.

The mean ages of cats and dogs in this study suggests that pre-GA screening is more likely to be taken up by the owners of elderly animals as the surgical workload includes a large number of young animals presented for routine neutering. This may represent stronger recommendation for screening by the veterinarians associated with elderly cases.

Most cats (97 per cent) and dogs (95 per cent) had at least one blood test result outside the declared reference range, though these were not necessarily considered clinically significant.

The results of this study differ from the canine study reported by Alef and others (2008) in which the authors would have reclassified 104/1298 dogs (5 per cent) at a higher ASA status category based on blood screening results, surgery would have been postponed in 10 dogs (0.8 per cent), additional preanaesthetic therapy would have been provided in 19 (1.5 per cent) and the anaesthetic protocol altered in two dogs (0.2 per cent).

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*TABLE 1: Tests included in the practice pre-GA blood screen*

| Haematology | Serum chemistry |
|-------------|-----------------|
| Red blood cell count | Alkaline phosphatase |
| Haemoglobin | Alanine aminotransferase |
| Packed cell volume | Creatine |
| Mean corpuscular volume | Glucose |
| Mean cell haemoglobin concentration | Total protein |
| White blood cell count | Urea |
| Platelet count | Sodium |
| Potassium |

Pre-GA, pregeneral anaesthetic

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FIG 1: Haematological deviations from reference range in 471 dogs. The numbers of dogs with values below, within or above the reference ranges are indicated. Three out of 474 dogs did not have haematological tests done.

FIG 2: Biochemical deviations from reference range in 471 dogs. Three out of 474 dogs did not have the biochemical tests done.

FIG 3: Electrolyte deviations from reference ranges in 458 dogs. Sixteen out of 474 dogs did not have electrolytes run.
FIG 4: Haematological deviations from reference range in 294 cats. The numbers of cats with values below, within or above the reference ranges are indicated. Four out of 298 cats did not have haematological tests done.

FIG 5: Biochemical deviations from reference range in 297 cats. One out of 298 cats did not have the biochemical tests done.

FIG 6: Electrolyte deviations from reference ranges in 291 cats. Seven out of 298 cats did not have electrolytes run.
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