

# EFFECTS OF PERITONEAL DIALYSIS ON BLOOD GAS PARAMETERS IN SMALL ANIMALS: RETROSPECTIVE STUDY.

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## Introduction

- Peritoneal dialysis (PD) is frequently used in small animals.
- Correcting acid-base problems is one of its goals.
- The objective of this study was to evaluate effects of PD performed with a commercial dialysis solution on blood gas (BG) and electrolytes values in dogs and cats with Acute Kidney Injury (AKI).

## Methodology

- A retrospective study was conducted including dogs and cats diagnosed with AKI or acute on chronic kidney disease and undergoing PD with Physioneal-40 Glucose 1.36% (Baxter®) dialysate solution (Fig.1).
- All BG and electrolyte analysis were performed with a ABL90 FLEX analyzer (Radiometer®, Copenhagen) Fig.2. Lactate Ringer's was administered as maintenance fluid.
- The Shapiro–Wilk test was used to assess distribution of variables. Mean ( $\pm$ standard deviation) is used for normally- and median (minum- maximum) for non-normally distributed data.
- Paired t test and Wilcoxon signed ranks test were used to evaluate variations after treatment (parametric and nonparametric distribution respectively).  $P < 0.05$  was considered statistically significant.



Fig.1: Physioneal-40 Glucose 1.36% (Baxter®) dialysate solution.



Fig.2: ABL90 FLEX analyzer



Fig.3: Lateral survey radiograph of the abdomen showing a PICC and a 8 mm Blake drain in a cat.



Fig.4: One feline patient during a PD session

Table n°1: Blood gas (BG) and electrolytes values in first and second BG analysis (n=8).

Parameter	Sample 1	Sample 2	$\Delta$	P
pH	7.160 $\pm$ 0.17	7.318 $\pm$ 0.077	0.159 $\pm$ 0.115	0.005 *
HCO <sub>3</sub> mmol/L	14.13 $\pm$ 7.045	21.07 $\pm$ 6.505	6.943 $\pm$ 2.541	<0.0001 *
BE	-15.5 (-28.3-6.20)	-3.70 (-14.2-9.90)	9.6 (3.7-15.2)	0.007 *
pCO <sub>2</sub> mmHg	36.40 $\pm$ 9.763	41.06 $\pm$ 7.846	4.688 $\pm$ 5.714	0.053
Na <sup>+</sup> meq/L	151(134-152.8)	147(136-151)	-1.40 (-7.0-3.0)	0.328
K <sup>+</sup> meq/L	5.051 $\pm$ 1.353	4.223 $\pm$ 1.402	-0.829 $\pm$ 1.801	0.234
Cl <sup>-</sup> meq/L	115.4 $\pm$ 7.913	110 $\pm$ 5.178	-5.29 $\pm$ 6.499	0.074
Glucose mg/dL	141.9 $\pm$ 121.2	139.3 $\pm$ 56.64	-2.57 $\pm$ 145.4	0.964

\* $P < 0.05$  statistically significant.

## Results

- 8 animals were enrolled (6 dogs and 2 cats) between 2016 and 2020. Four were male and four female. Fig 3 and 4.
- Mean age was 8.50 $\pm$ 3.8 years and median weight 9.4 kg (1.9-35.4).
- The mean time gap between first and second BG analysis was 29.13 $\pm$ 9.25h.
- Significant increase was observed for  $\Delta$ pH,  $\Delta$ HCO<sub>3</sub>,  $\Delta$ BE and almost significant for  $\Delta$ pCO<sub>2</sub> (Table n°1).
- Change was not significant for  $\Delta$ Na<sup>+</sup>,  $\Delta$ K<sup>+</sup>,  $\Delta$ Cl<sup>-</sup> and  $\Delta$ Glucose.
- Mean number of exchanges performed in between the 2 BG samples was 9.13 $\pm$ 3.39.
- Fluid volume introduced was 37.21 $\pm$ 10.99 ml/kg. Median dwell time was 1.75h (1-4).

## Conclusion

- All patients with AKI undergoing PD with Physioneal-40 Glucose 1.36% as dialysate solution experienced improvement in their acid based status.
- No impact on electrolytes was observed possibly due to a type II statistical error.
- The significant changes seen might be associated to progression of disease or other therapies and not necessarily due to peritoneal dialysis.