

THE EFFECT OF HYDROCORTISONE ON URINARY PROTEIN EXCRETION IN DOGS
Schellenberg S¹, Gentilini F², Glaus TM¹, Reusch CE¹. ¹Clinic for Small Animal Internal Medicine, University of Zurich, Switzerland. ²Departement of Veterinary Clinical Sciences, University of Bologna, Italy.

Proteinuria is commonly encountered in dogs with exogenous or endogenous glucocorticoid excess. Recognized mechanisms of proteinuria include altered glomerular capillary permeability, increased tubular protein excretion, decreased tubular resorption and excess protein filtration that overwhelm tubular reabsorption. However, to the authors knowledge, it has not been determined whether the effects of hydrocortisone are transient or permanent. The purpose of this study was to evaluate urinary protein excretion in dogs during and after long-term hydrocortisone administration.

Eleven adult Beagle dogs (6m, 5f, 3.5 years) were studied before, during and after administration of hydrocortisone (n=5; I-HAC) (8mg/kg PO bid for 90 days) or placebo (n=6). Urine protein:creatinine ratio (UP/C), urine albumine:creatinine ratio (UA/C), microalbuminuria (MALB) and sodium dodecyl sulphate-agarose gel electrophoresis (SDS-AGE) were evaluated before (t0), on day 1 (t1), 5 (t2), 28 (t3), 56 (t4), 84 (t5) of treatment and 1 (t6), 5 (t7), 28 (t8), 56 (t9) and 84 (t10) days after withdrawal of hydrocortisone and placebo, respectively.

Before treatment, median UP/C were 0.18 (0.17 – 0.25) and 0.22 (0.12 – 0.29) for hydrocortisone and placebo treated dogs, respectively. UP/C increased only in the I-HAC group (p<0.005) to a maximum of 0.45 (0.18 – 1.77) at t3. UA/C were 0.015 (0.009-0.019) and 0.016 (0.005-0.081) for I-HAC and placebo group, respectively. UA/C also increased progressively in the I-HAC group to a maximum of 0.134 (0.033 – 1.240) on t5 (p<0.005). MALB was already present before treatment in some dogs of the placebo group but not in the I-HAC group. Four dogs of the I-HAC group developed MALB during treatment. After discontinuation of hydrocortisone, both UP/C and UA/C progressively decreased to 0.17 (0.12 – 0.31) and 0.010 (0.005 – 0.032), respectively at t8, and were not different from values at t0. An effect of gender on urinary protein but not albumin excretion was found; UP/C was significantly higher in male dogs before and on each occasion after stopping hydrocortisone administration. SDS-AGE revealed primarily albuminuria in all dogs at different times, with a pronounced increase in the I-HAC group during treatment. Already one month after discontinuation of hydrocortisone SDS-AGE showed no or only weak bands for albumin as at t0. Furthermore, a protein of 25-30 kD was found in urine samples of all male dogs but never of female dogs.

In conclusion, our study shows that long-term glucocorticoid treatment results in a significant but only transient proteinuria that already resolves within one month of discontinuation of hydrocortisone. Higher UP/C but not UA/C in male dogs is probably due to the 25-30 kD protein found only in male dogs, thought to be the canine prostate specific esterase.