Proteinuria in Dogs

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In the Literature

Meindl AG, Lourenço BN, Coleman AE, Creevy KE. Relationships among urinary protein-to-creatinine ratio, urine specific gravity, and bacteriuria in canine urine samples. *J Vet Intern Med*. 2019;33(1):193-199.

FROM THE PAGE ...

Persistent proteinuria is a marker of chronic kidney disease and associated with increased risk for disease progression. Clinical relevance of proteinuria has been linked to its magnitude; in dogs with a urine protein:creatinine (UP:C) ratio persistently >0.5, further diagnostic investigation and treatment are recommended by the International Renal Interest Society.[1] The urine dipstick test is a readily available diagnostic tool, but it is not considered reliable for quantitative estimation of proteinuria and results may be influenced by urine specific gravity (USG). UP:C is considered to be the most reliable method for urine protein quantification but may be elevated by presence of bacteria and inflammatory cells in the urine.

This study addressed whether combining patient USG and dipstick protein results (ie, negative, trace, +1, +2, +3, +4) provides a reliable estimate of urine protein quantity, as combining these results may help clinicians determine when submission of UP:C is indicated. The study also sought to evaluate whether UP:C is affected by bacteriuria and whether elevation of UP:C correlates to bacterial load (colony forming units [CFU]/mL).

By examining medical records of 394 dogs (482 visits) with performed urinalyses, urine cultures, and UP:C, the researchers found only a weak correlation between UP:C and USG in each positive dipstick category; this demonstrates that the urine dipstick test is not a reliable tool for protein quantification, even when USG is considered. Dogs with a negative protein dipstick result were unlikely to have abnormal UP:C (>0.5) independent of USG. UP:C was negative (ie, ≤0.5) in 19 of 46 cases with positive urine cultures characterized by heavy growth (≥100,000 CFU/mL); there was only weak correlation between bacterial load and increased UP:C. The proportion of cases with active sediment was similar between proteinuric and nonproteinuric cases. These data indicate poor alignment between UP:C and positive urine culture results, thus challenging the perception that UP:C is automatically elevated in dogs with UTIs or subclinical bacteriuria.

... TO YOUR PATIENTS

Key pearls to put into practice:

1. The likelihood of abnormal UP:C (>0.5) is low in dogs with a negative protein urine dipstick result, regardless of USG.
2. Combining USG and positive dipstick protein category (trace, +1, +2, +3, +4) results does not provide a reliable estimate of protein quantity. Therefore, UP:C should be evaluated to assess the magnitude and relevance of proteinuria in dogs with a positive protein urine dipstick result.
3. UP:C can be normal in dogs with UTIs or subclinical bacteriuria; therefore, the presence of these conditions cannot explain abnormal UP:C. UP:C should be evaluated again after resolution of bacteriuria to assess whether further investigation is indicated.

Reference

1. Grauer GF. Proteinuria: measurement and interpretation of proteinuria and albuminuria. International Renal Interest Society website. http://www.iris-kidney.com/education/proteinuria.html. Updated 2016. Accessed August 26, 2019.