Diseases of the Equine Urinary System

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KEYWORDS

• Equine • Glomerulonephritis • Interstitial nephritis • Renal • Tubular necrosis • Urinary

KEY POINTS

- Diseases of the equine urinary system have multiple potential etiologies, including infectious agents, toxins, developmental abnormalities, and neoplasia.
- A minimum diagnostic database is essential for diagnosis of urinary diseases and should include a complete blood count, serum biochemistry, and urinalysis, in addition to a thorough physical examination and medical history.
- Renal and urinary bladder biopsies are valuable tools in determining a definitive diagnosis in cases of equine urinary diseases.

INTRODUCTION

Urinary diseases of equines encompass many disease entities at various locations within the urinary tract and can be an indicator of systemic health. The urinary system can be divided into an upper, or renal, and a lower urinary tract, which consists of ureters, bladder, and urethra. Although perhaps not common, renal disease can be caused by a variety of infectious, immune-mediated, developmental, and toxic insults, which if not identified and addressed may result in a poor outcome for the animal. As a clinician, quickly and definitively identifying an etiology for renal disease may be impeded by vague, nonspecific clinical presentations and potentially by the lack of sensitive, accessible diagnostic parameters as an indicator of renal impairment. Because of these limitations, the clinician should be well equipped with the knowledge of equine urinary pathology and various etiologies that will produce lesions in the urinary tract, which is the focus of this review.

A minimum database that includes a thorough history, physical examination, complete blood count, serum biochemistry, and urinalysis is essential for identification of urinary disease. Glomerular disease is distinguished by the presence of persistent

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proteinuria with or without azotemia.[1,2] This can be differentiated from tubulointerstitial disease, which frequently lacks significant proteinuria, but alterations in baseline serum creatinine and urine-concentrating abilities should be evident.[1] Lower urinary tract diseases can present with variable clinical symptoms and clinicopathologic abnormalities. Urinary bladder distention, dysuria, or pollakiuria can be the result of an obstruction from urolithiasis or neoplasia. Urinary incontinence may be indicative of a developmental anomaly such as ectopic ureter.

Additional diagnostic modalities can further help localize disease, tailor treatment, and have prognostic relevance. A few of these include renal biopsy, imaging such as ultrasound, cystoscopy, and microbiologic, molecular, and serologic assays. Fig. 1 outlines the major categories of equine urinary diseases discussed here for an easy, quick reference to this review.

UPPER URINARY TRACT DISEASES

Glomerular Diseases

Glomerular injury can be mediated by immunologic and nonimmunologic processes.[3,4] Antibodies directed at glomerular antigens or soluble immune complexes that deposit within glomeruli are the 2 major routes of immunologic injury to glomeruli of domestic animals.[5] Although glomerular disease is not commonly clinically apparent, immune-complex glomerulonephritis occurs with some frequency in horses.[5–8] Equine infectious anemia and *Streptococcus equi* have been implicated in immune-complex membranous and membranoproliferative glomerulonephritis of

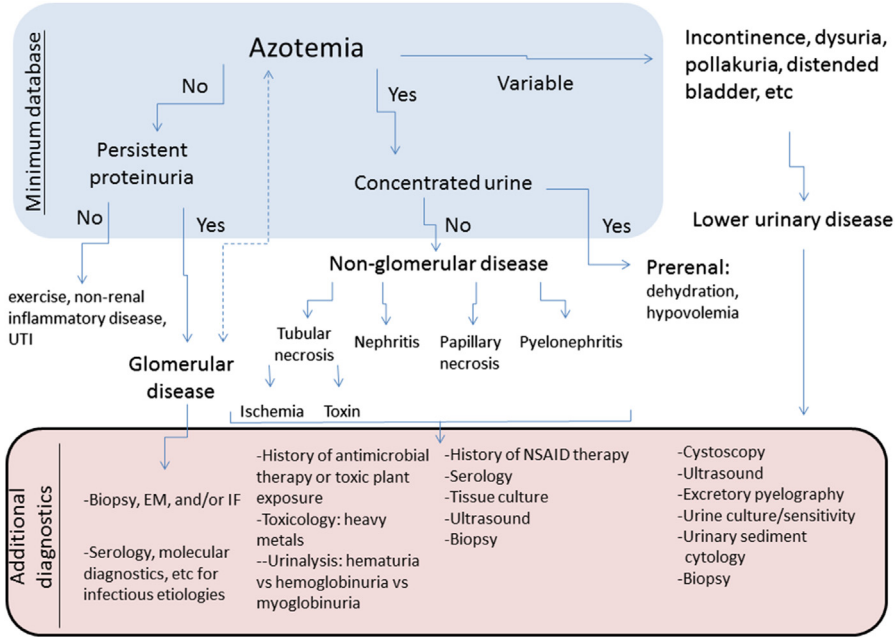

Fig. 1. Flow chart of equine urinary diseases discussed in this review. Solid lines represent clinicopathologic derangements associated with general categories of urinary diseases. Dashed line indicates that persistent proteinuria is typical of glomerular disease although concurrent azotemia may or may not be present. EM, electron microscopy; IF, immunofluorescence.