

## Correlation of Urinary Waxy Casts with Renal Pathology

**Authors :** Muner M. B. Mohamed, Vipin Varghese, Dustin Chalmers, Khalid M. G. Mohammed, Juan Carlos Q. Velez

**Abstract :** Background: Urinary waxy casts (uWxC) are traditionally described in textbooks as indicative of chronic renal parenchymal disease. However, data supporting this contention is lacking. uWxC can be seen in the context of various renal syndromes, including acute kidney injury, chronic kidney disease, rapidly progressive glomerulonephritis (GN), and nephrotic syndrome. Thus, we investigated the correlation between the identification of uWxC and renal pathological findings. Methods: We prospectively collected data of patients seen in nephrology consultation with a urine specimen subjected to the microscopic examination of the urinary sediment (MicrExUrSed) over a 3-year period. Within this cohort, we identified cases in which a kidney biopsy was concomitantly performed. We assessed the association of uWxC with glomerular or tubular pathology and with chronicity [interstitial fibrosis and tubular atrophy (IFTA) and glomerular obsolescence (GO)]. Results: Among 683 patients with MicrExUrSed, 103 (15%) underwent kidney biopsy and were included. The mean age was 55 years, 51% women, 50% white, and 38% self-identified black. Median serum creatinine was 3.2 (0-7-15.6) mg/dL and not significantly different between those with and without uWxC (4.7 vs 3.8 mg/dL,  $p=0.13$ ). uWxC was identified in 35 (34%) cases. A glomerulopathy was diagnosed in 79 (77%). Among those with uWxC ( $n=35$ ), a glomerulopathy was more likely to be found with concomitant acute tubular injury (ATI) than without ATI (57% vs. 23%,  $p=0.0006$ ), whereas among those without uWxC, glomerulopathies were found with or without concomitant ATI with similar frequency (41% vs. 34%,  $p=0.48$ ). Overall ( $n=103$ ), more patients with uWxC had  $\geq 20\%$  IFTA compared to those without uWxC (74% vs 51%,  $p=0.03$ ). Among those with glomerulopathy ( $n=79$ ), more patients with uWxC had  $\geq 20\%$  IFTA compared to those without uWxC (89% vs. 56%,  $p=0.004$ ). uWxC did not correlate with GO. Conclusion: Identification of uWxC denotes a greater likelihood of finding evidence of ATI superimposed with a glomerulopathy rather than finding an isolated glomerular lesion. uWxC is associated with a greater probability of finding  $\geq 20\%$  IFTA in a kidney biopsy specimen, particularly in those with a glomerular pathology. This observation may help clinicians weigh on the suitability of a kidney biopsy when chronicity or coexistence of ATI is in question.

**Keywords :** waxy cast, kidney biopsy, acute tubular injury, glomerulopathy

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