Urinary Elastase: The Contribution of the Lower Urinary Tract

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Dear Sir,

Neutrophil elastase is released from polymorphonuclear leucocytes during phagocytosis, or when the cells are activated by other stimuli such as immune complexes and endotoxin [1]. Measurement of the released enzyme is thus a sensitive measure of neutrophil activity. In plasma, elastase forms an inhibited complex with α_1 -anti-trypsin of molecular weight 111,000, and significant glomerular filtration of elastase into urine would not normally occur. Measurement of elastase in urine could therefore be a sensitive marker of renal inflammation in conditions such as glomerulonephritis or pyelonephritis; alternatively, urinary elastase may originate from the lower urinary tract. We investigated these alternatives by measurement of elastase in both voided and bladder urine (table 1).

Eleven patients, 8 male and 3 female, who were to undergo cysto-urethroscopy, were asked to produce a voided urine and subsequently had urine sampled from the bladder at cystoscopy. The specimens were taken into sterile containers and stored at -20°C until assayed for neutrophil elastase, using an in house radio-immunoassay similar to that of Plow [2], which was specific for human neutrophil elastase and sensitive to 0.4 ng/ml.

The elastase concentration in voided urine was very significantly higher than that in bladder urine ($p < 0.001$); indeed a higher concentration was found in voided urine from every patient tested and in 8/11 the increase was greater than 3-fold. There was no difference between the sexes in this respect. In both sexes therefore, the lower urinary tract makes a significant contribution to overall urinary elastase and this enzyme cannot be considered a marker for renal inflammation. However there was a wide range of elastase levels in the voided urines of these patients, and urinary elastase measurement may prove to be valuable in the assessment of occult lower urinary tract inflammation e.g. prostatitis or urethritis.

Table 1. Comparison of elastase levels (ng/ml) in voided and bladder urine in 11 patients

References

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