The Use of Monoclonal Antibodies in Microscopic Urinalysis in Analgesic Nephropathy, Polycystic Kidney Disease and Medullary Sponge Kidney Disease

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Dear Sir,

Pyuria is a common feature of analgesic nephropathy (AN) and polycystic kidney disease (PCKD). The detected cells have conventionally been assumed to be 'pus cells' or granulocytes. In order to identify these cells, we examined the urine of patients with AN, PCKD and medullary sponge kidney disease (MSKD) with so-called 'sterile pyuria' with a panel of commercially available monoclonal antibodies and an immunoperoxidase technique [1, 2]. Patients with culture-proven infection were excluded from the study.

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Urine specimens (midstream or suprapubic bladder aspiration) from 20 patients with AN, 21 patients with PCKD and 4 patients with MSKD were studied. Cells from washed deposits were transferred to gelatinized slides in a cytocentrifuge, air dried, acetone fixed and then subjected to microwave irradiation as described previously [1, 2]. Slide preparations were then treated with monoclonal antibodies (FMC 10, FMC 32, AMD T4, HuLy-m8, URO 1, 3, 5, 8 and 9) using a four-layer peroxidase-antiperoxidase technique that had been optimized for urine sediments [1, 2]. Control preparations with mouse monoclonal antibody of unknown specificity were set up with each test. Eosinophils were assayed with one slide that had been stained with Leishman's stain. Cell viability was determined by trypan blue exclusion. Urine specimens were also cultured for aerobic, anaerobic and fastidious organisms.

Percentages of each cell type were determined by counting up to 400 free cells for each slide.

The results were then converted into

Table 1. Profile of nucleated nonsquamous cells in urine in AN, PCKD and MSKD

All values are given as means $\pm$ SEM. The number of patients per group is given in parentheses.

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absolute numbers of cells per milliliter of urine based on the total nonsquamous nucleated cell count at the initial microscopic examination.

Mann-Whitney rank sum tests were performed to determine significant differences in the total cell count, numbers of the different cell types and cell viability between the three conditions. The relationship between the number of nucleated nonsquamous cells in urine and serum creatinine and creatinine clearance was assessed by analysis of variance.

Only culture-negative (< 50 CFU/ml of aerobic, anaerobic or fastidious organisms) urine specimens with cell counts of 5,000/ml and above were subjected to immunoperoxidase staining and assessment of cell viability. These included 9 out of 18 patients with AN, 13 out of 21 patients with PCKD and 3 out of 4 patients with MSKD. The profiles of cells in the urine of these patients are presented in table 1. T4 and T8 lymphocytes, glomerular epithelial and loop of Henle cells were absent in the urine in all three conditions. There were no significant differences in any of these parameters assessed between the three conditions.

There was no correlation between the total number of nucleated nonsquamous cells in the urine with serum creatinine or creatinine clearance in all three conditions. For this correlation, all patients whose urine cultures were negative were included (AN, 18; PCKD, 21; MSKD, 4). ml) was recorded in the urine specimens that were subjected to immunoperoxidase staining, thus making it unlikely that urinary tract infection was a cause of pyuria in these patients.

There was no correlation between the total number of nucleated nonsquamous cells in the urine with serum creatinine or creatinine clearance in all three conditions, suggesting that this parameter is not useful as a marker for determining progression towards renal failure.

References

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The profiles of cells in AN, PCKD and MSKD were similar. Granulocytes were the predominant cells in each patient category (84–86%) followed by tubular cells (8–12%). Monocytes (1–3%) and eosinophils (2–3%) were present in very low numbers, whilst lymphocytes were virtually absent in all three conditions. No growth of aerobic, anaerobic or fastidious organisms (< 50 CFU/