Comparison between Sediment Analysis and a Simple Stick Test for Pyuria

Accuracy and Technologist Bias

A.A.	Amin A.	Nanji
W.	Wendy	Adam
D.J.	Donald J.	Campbell

Division of Clinical Chemistry, Vancouver General Hospital, and Department of Pathology, University of British Columbia, Vancouver, B.C., Canada

Amin A. Nanji, MD, FRCP (C), Division of Clinical Chemistry, Vancouver General Hospital, Vancouver, BC V5Z 1M9 (Canada)

Dear Sir,

Examination of urine for the presence of leukocytes is important in evaluation of urinary tract infections. Most laboratories rely on microscopic examination of the urine sediment. Recent studies have shown that a chemical dipstick test is accurate for detecting significant numbers of white cells in urine [1–3]. The purpose of the present study was to evaluate the degree of accuracy with which the stick test predicted the leukocyte concentration in urine as assessed by microscopic analysis of urine sediment. Also, because the performance of urinalysis is usually relegated to ‘the lowest man on the totem pole’, i.e., the junior technologist, we evaluated the role of technologist bias in interpretation of both chemical and sediment analysis for white cells. Clean voided urine specimens were obtained from 200 patients (91 males, 109 females) at the Vancouver General Hospital. All specimens were divided into three aliquots and processed within 1 h of examination. Each aliquot was tested independently of others to decrease observer bias. The first aliquot was tested by the dipstick for leukocytes (Chemstrip, Boehringer, Mannheim, FRG). The specimen was tested separately by both a junior technologist (less than 2 months training in urinalysis) and a senior technologist (in charge of urinalysis for over 2 years). The strip was inspected after 15 min, and the white cell count in urine was defined as falling into 1 of 3 categories depending on the color change: negative or less than 10 cells/ μ l, 10–25 cells/ μ l, and > 25 cells/ μ l. The 2nd and 3rd aliquots were used for examination of the urine sediment after centrifuging the urine at 2,000 rpm for 5 min. Ten consecutive high-power fields ($\times 400$) were observed and the results reported as < 5 , 5–10, and > 10 WBCs/HPF.

The comparison of results between the dipstick and sediment analysis of WBCs done by the senior technolo-

Table I. Comparison of results obtained by dipstick and sediment analysis for WBCs in urine (number of patients in parentheses)

gist is shown in table I. Of the 200 dipstick analyses, agreement between the two technologists occurred in 196 cases (98%). Of the 200 sediment analyses, there was agreement in 162 cases (81%). Of the 38 times they differed, major discrepancies occurred nine times where the junior

technologist reported < 5 WBCs/HPF, whereas the senior technologist reported > 10 WBCs/HPF.

The results of the above study confirm the previously reported findings of the acceptable accuracy of the stick test in the detection of urinary leukocytes [1–3]. In addition, we also found that technologist bias is lesser when presence of WBCs is evaluated by the dipstick method as compared to sediment analysis. Because of the simplicity of analysis and the apparent lack of significant technologist bias in evaluating the result, we feel that the dipstick test for leukocytes in urine is an acceptable and less expensive alternative to sediment analysis. Since almost 50–60% of urine sediment analysis requests yield the presence of WBCs only [4], use of the dipstick should reduce the demands on laboratory services.

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