

Review

Appropriate Laboratory Testing

Urine Protein and Sulfosalicylic Acid (SSA) Testing

Humboldt State University, Student Health Center

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PURPOSE: To review current practice of confirming all abnormal dipstick urine protein's with sulfosalicylic acid testing.

Protein in urine can be the result of urological and nephrological disorders. But it can also be temporarily elevated by strenuous exercise, orthostatic proteinuria, dehydration, urinary tract infections and acute illness with fever. The protein test pad on the Siemens dipstick measures albumin. The sulfosalicylic acid test detects albumin, globulins and Bence-Jones proteins at low concentrations. The sulfosalicylic acid test is the differential screening urine protein test for monoclonal light chain diseases i.e. multiple myeloma or pancreatic transplants with anastomosis.

The primary diagnostic procedure would be concomitant testing of all urine with both dipstick and sulfosalicylic acid. If albumin is not present with the dipstick, testing with sulfosalicylic acid will detect other proteins, including light chains. If albumin is present with the dipstick, testing with sulfosalicylic acid can only add additional information if the reaction is greater than the dipstick, indicating not only the presence of albumin but also globulins or Bence-Jones proteins.

Our current practice of confirming positive dipstick with sulfosalicylic acid testing is screening for monoclonal light chain diseases.

PERFORMANCE GOAL:

To provide accurate, timely results in a cost effective manner without duplicating our work effort.

DESCRIPTION OF DATA:

The Clinitek Status analyzer printouts were reviewed from the past semester for all abnormal urine proteins. Written on the instrument tapes are the SSA test results for these samples. The SSA results are reported as the urine protein result per laboratory policy.

DATA ANALYSIS & INTERPRETATION:

During the period from August, 2016 through December, 2016, there were thirty-five recorded abnormal proteins. Thirty-three (94%) correlated with the dipstick result. Two SSA test results were negative for protein compared to the dipstick result of 1+ (30 mg/dl).

Number Tested	Reported SSA	Reported Dipstick
12	1+	1+
19	2+	2+
2	3+	3+
2	Negative	1+

The package insert for the urine dipstick test states that visibly bloody urine may cause falsely elevated protein results. Both samples with conflicting results had blood (1+ and 3+).

The SSA is a protein precipitation test. Equal volumes of clear urine sample and 3% sulfosalicylic acid are mixed and read for turbidity after 5 minutes. Turbidity is graded 1+ to 4+. If the urine sample is turbid it must be spun, before testing, for 5 minutes to clear the supernatant. Depending on availability of the centrifuge throughout the day, urine dipstick results can be delayed by 5-15 minutes, waiting to perform the confirmatory test.

CLIA requires two levels of control run each day of use. The control material is tested each morning as it is assumed that confirmatory protein testing will occur at some time during the day.

Recently our clinic implemented a policy of ordering only a dipstick UA on patients presenting with uncomplicated urinary tract symptoms. The purpose was to expedite laboratory test results to improve patient flow through the clinic. Delaying UA results to confirm protein is counterproductive to our goal of expediting lab results.

The confirmatory testing was historically performed to confirm results obtained from the urine dipstick. Our data show that confirmatory test results agree with those from the automated urinalysis. Currently there is no guideline on confirmatory test needs. Clinical and Laboratory Standards Institute (CLSI), a national organization that makes recommendations for best practice laboratory standards, states that "many of the historical confirmatory urinalysis tests may not be relevant to current laboratory practice." Laboratory accrediting agencies, such as the College of American Pathologists (CAP) and COLA do not require these confirmations and suggest that users follow the manufacturer's recommendations. The manufacturer makes no recommendations to confirm protein dipstick results.

Our current practice is screening for diseases, such as multiple myeloma, which are not a frequent diagnosis in our clinic.

IMPLEMENTATION:

Based on a review of our data and the literature, I recommend we discontinue confirming positive urine dipstick protein results with the SSA test. Our data show that the confirmatory test results agree well with the automated urinalysis result. Using a qualitative methodology to confirm another qualitative method duplicates work, increases costs and delays patient results.

The urine dipstick is a screening test that can be completed in a matter of minutes at minimal expense and with appropriate patient results. The timely results and reduced duplication of technologist testing services benefit the clinic and the patient. More accurate urine testing is available if the physician wants to pursue diagnosing urological and nephrological disorders.

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REFERENCES:

Siemens Multistix 10 SG package insert. June, 2010

Clinical and Laboratory Standards Institute: Urinalysis: Approved Guideline-Third Edition. Wayne, PA, 2009. CLSI document GP16-A3

Date: _____

Date: _____

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Method Comparison Worksheet

Date: February, 2017

Analyte: Urine Protein

Primary Method: Siemens Multistick

Secondary Method: Sulfosalicylic Acid Test (SSA)

Sample #	Result Urine Dipstick	Result SSA Test	Agreement
43082	2+	2+	Yes
41173	1+	1+	Yes
41227	1+	1+	Yes
41195	2+	2+	Yes
41779	2+	2+	Yes
41276	3+	3+	Yes
41368	2+	2+	Yes
41650	3+	3+	Yes
41587	1+	1+	Yes
41579	2+	2+	Yes
41478	2+	2+	Yes
41460	1+	1+	Yes
41459	2+	2+	Yes
42158	1+	Negative	No
41138	1+	1+	Yes
41081	2+	2+	Yes
42101	2+	2+	Yes
40972	1+	1+	Yes
42032	2+	2+	Yes
40634	2+	2+	Yes
40562	2+	2+	Yes
40469	2+	2+	Yes
40439	2+	2+	Yes
40311	2+	2+	Yes
40239	1+	1+	Yes
40230	1+	1+	Yes
40201	2+	2+	Yes
40154	1+	1+	Yes
39746	1+	Negative	No
39773	2+	2+	Yes
39718	2+	2+	Yes
39675	1+	1+	Yes
39673	2+	2+	Yes
40028	1+	1+	Yes
39945	1+	1+	Yes