

BLADDER CANCER HEMATURIA AND POINT-OF-CARE TESTS

Researchers at Eberhard Karls University in Tuebingen, Germany have conducted the first study comparing the impact of hematuria on four commonly used point-of-care tests (POCTs) for diagnosing bladder cancer.

There are many available POCTs—for example, NMP22-BladderCheck® (Matritech, Freiburg, Germany), BCM® (Ulti med GmbH, Ahrensburg, Germany), BioNexia-BTA® (BioNexia, Gothenburg, Germany) and BTAstat® (Polymedco, New York, USA)—for timely, cost-effective diagnosis of bladder cancer. However, hematuria is a common presenting symptom in a high proportion of suspected bladder cancer patients. Thus, the influence of blood on the performance of these tests is an important variable to consider when assessing their general effectiveness.

The researchers first constructed a model to determine the influence of the urinary blood burden (red blood cell count) on the different POCTs. Using urine samples from healthy patients without bladder cancer doped with whole blood at differing concentrations, they generated samples containing red blood cells in proportions ranging from 0.000625% to 0.5%. Of the four POCTs, NMP22-BladderCheck® was the most resistant to blood, tolerating a red blood cell concentration of up to 0.25% (10.730 cells/ μ l). The worst performing test in this experimental series, BTAstat®, was affected at <0.00625% (168 cells/ μ l).

Next, urine samples from 54 patients, with either suspected or confirmed bladder cancer were tested. Once again, the NMP22-BladderCheck® POCT performed best, with fewer false-positive results for the 17 patients without bladder cancer. For example, three patients in this group presented with severe microscopic or gross hematuria and received false-positive results from all POCTs except NMP22-BladderCheck®.

The differences in the performance of the tests might be attributable to what they detect. It is possible that NMP22-BladderCheck® is more robust than the other tests, which all detect human complement factor H and related protein (the bladder tumor-associated antigen), because NMP22 cannot be directly increased by anucleate red blood cells.

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