# Study finds routine tests done on patients with microscopic blood in urine can be avoided

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The presence of microscopic hematuria – blood found in urine that can't be seen by the naked eye – does not necessarily indicate the presence of cancer, according to a Kaiser Permanente Southern California study published in the journal *Mayo Clinic Proceedings*. The study suggests that tests routinely done on patients with this condition could be avoided and has led to the creation of a screening tool to better diagnose certain types of cancers.

The observational study examined the electronic health records of more than 4,000 patients with microscopic hematuria who were members of Kaiser Permanente health plans in Southern California, Northern California, and the Pacific Northwest between January 2009 and August 2011. The study found that an extremely small proportion of patients with microscopic hematuria were subsequently discovered to have cancer: Among the 4,414 patients that were evaluated for the condition, only 2.3 percent were diagnosed with bladder cancer and only 0.2 percent had a pathologically confirmed diagnosis of renal cancer.

The researchers conclude that patients with microscopic hematuria, especially those under 50 years of age and with no history of gross hematuria (visible blood in the urine), may not benefit from further evaluation and therefore could avoid routine tests that contain unnecessary risks such as radiation exposure from CT scans and invasive endoscopy.

"This study provides scientific data that confirms what others have suspected – that microscopic hematuria is an unreliable indicator of renal or bladder cancer," said study lead author Ronald K. Loo, MD, and regional chief of urology for the Southern California Permanente Medical Group. "This suggests that a large number of follow-up examinations of patients with asymptomatic microscopic hematuria, which often includes radiologic and invasive procedures, could be safely avoided."

According to the American Urological Association, blood in the urine is often not a sign of significant disease. Studies show that between 9 to 18 percent of healthy individuals report at least some degree of hematuria. However, current AUA recommendations state that even low degrees of microscopic hematuria could be considered a risk factor for cancer. Patients with this condition often receive recommendations for follow-up evaluations that can include urine testing, CT scans, renal ultrasounds, and cystoscopy, in which a physician uses a scope to examine the lining of the bladder and urethra. The risks associated with these procedures include radiation exposure, urinary tract infections, and sepsis.

"Primary care physicians should be aware that performing follow-up examinations on patients with asymptomatic microscopic hematuria contains an element of unnecessary risk. By far, a much more reliable indicator of the presence of urinary cancer is whether or not a patient has gross hematuria," said Loo. "It is our hope that the findings of this study may be used to simplify referral guidelines for evaluation of these patients and will thus reduce the number of unnecessary work-ups that could involve health risks such as radiation exposure from CT scans."

The researchers also used the data compiled from the study to create a model to predict renal and bladder cancer risk. Called the Hematuria Risk Index, the model assigns points for specific cancer risk factors. Higher risk factors, such as a history of gross hematuria and patient age

of 50 years or over, are assigned four points while lower risk factors, such as a history of smoking, and patients who are male, are given one point. Researchers were then able to group patients into low, moderate, and high risk of renal or bladder cancer. Researchers found that of the 32 percent of patients who were identified as having a low risk of cancer, only 0.2 percent had a cancer detected. And of the 14 percent of the patients who were identified as high risk, 11.1 percent had a cancer detected.

This study is part of Kaiser Permanente's ongoing efforts to better understand urinary malignancy and identify related treatments. In 2007, a national group of Kaiser Permanente urology chiefs agreed that national practice recommendations were needed to address existing variations in the management and evaluation of hematuria. Using a Kaiser Permanente guideline methodology, the group reached a consensus agreement on recommendations, including referral to urology when a person of any age is found to have gross hematuria or high-grade hematuria on a single test. And last year, a Kaiser Permanente Southern California study published in the Journal of Urology found that hematuria may trigger a battery of tests for urinary tract cancer that are invasive and can unnecessarily expose patients to radiation.

Kaiser Permanente can conduct transformational health research such as this study in part because it has the largest private electronic health system in the world. The organization's integrated model and electronic health record system, Kaiser Permanente HealthConnect®, securely connects 9 million people, 611 medical offices, and 37 hospitals, linking patients with their health care teams, their personal health information, and the latest medical knowledge. It also connects Kaiser Permanente's research scientists, clinicians, and operational leadersto one of the most extensive collections of longitudinal and medical data available, facilitating studies and important medical discoveries that shape the future of health and care delivery for patients and the medical

community.

**More information:** "Stratifying Risk of Urinary Tract Malignant Tumors in Patients with Asymptomatic Microscopic Hematuria," by Ronald K. Loo, MD; Stephen F. Lieberman, MD; Jeff M. Slezak, MS; Howard M. Landa, MD; Albert J. Mariani, MD; Gary Nicolaisen, MD; Ann M. Aspera, MD; and Steven J. Jacobsen, MD, PhD Mayo Clinic Proceedings, Volume 88, Issue 2 (February 2013), DOI: dx.doi.org/10.1016/j.mayocp.2012.10.004

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