



Original article

Diagnostic evaluation of patients presenting with hematuria: An electronic health record-based study

Kyle A. Richards, M.D.^{a,b,*}, Vania Lopez Ruiz, B.S.^b, Daniel R. Murphy, M.D., M.B.A.^{c,d},
Tracy M. Downs, M.D.^b, E. Jason Abel, M.D.^b, David F. Jarrard, M.D.^b,
Hardeep Singh, M.D., M.P.H.^{c,d}

^a Department of Surgery, William S. Middleton Memorial Veterans Hospital, Section of Urology, Madison, WI

^b Department of Urology, The University of Wisconsin-Madison, Madison, WI

^c Houston VA Center for Innovations in Quality, Effectiveness and Safety, Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX

^d Department of Medicine, Baylor College of Medicine, Houston, TX

Received 30 May 2017; received in revised form 4 October 2017; accepted 6 November 2017

Abstract

Background: To gain new insights into the origin and prevention of diagnostic delays in the evaluation of hematuria in an electronic health record (EHR)-based integrated care setting.

Methods: We performed a retrospective review of 298 consecutive patients with new-onset hematuria at a Veterans Affairs facility from January 1, 2011 to December 31, 2013 excluding those where diagnostic evaluation was unnecessary (i.e., cystoscopy within 3 years prior). We collected data on presentation, such as red flags of painless gross hematuria (PGH) or asymptomatic microhematuria (AMH) and subsequent evaluation (imaging, urologic referral, and cystoscopy). Delay was defined when evaluation was not completed within 60 days. Logistic regression was performed to identify predictors of delay.

Results: Of 201 patients, 149 had delays. PGH was present in 99 patients. These patients had a higher rate of urology referral within 1 year than patients with AMH (86.7% vs. 64.7%; $P < 0.01$) and were more likely to undergo cystoscopy (75.8% vs. 52%; $P < 0.01$). Delays occurred in 67% of PGH patients vs. 81% of AMH patients (OR 0.46; $P = 0.02$), and roughly a third were related to scheduling/coordination, patient-related issues, or delay in primary care referral. Bladder neoplasms were detected in 18% of patients with PGH and 2% of those with AMH.

Conclusion: Delays in evaluation for hematuria occur commonly, regardless of strength of the red-flag. Many delays were preventable and could be targeted with interventions including EHR-based tracking systems or reformed scheduling practices. Published by Elsevier Inc.

Keywords: Hematuria; Diagnosis; Urinary bladder neoplasms; Electronic health records; Safety

1. Introduction

Hematuria is a frequently encountered finding in adult ambulatory care and may be a sign or symptom of urologic cancer [1]. It may range from an incidental asymptomatic microscopic hematuria (AMH) lab finding to a more dramatic painless gross hematuria (PGH) presentation. The prevalence of AMH is variable but estimated at 0.9% to 18% in the adult population [1]. Up to 20% of certain

high-risk groups with AMH will be diagnosed with urologic cancer, including those with increasing levels of microscopic hematuria, increasing age, or smoking history [2–10]. In the absence of an obvious benign cause, AMH guidelines stress the importance of systematic and structured evaluation of all patients with cystoscopy and abdominal imaging. However, the perceived low risk of cancer, questionable cost-effectiveness, and low quality of evidence supporting these guidelines create uncertainty among primary care providers (PCP) [11,12]. In fact, Bateau and colleagues [13] performed an observational study in their health system using an electronic health

* Corresponding author. Tel: +1 608 262 0759; fax: +1 608 262 6453.
E-mail address: richardsk@urology.wisc.edu (K.A. Richards).

record (EHR) review in a population of primarily women (82%) with AMH (85%) and noted that urology referrals were placed in only 8% of women and 36% of men with AMH. It is unclear if these observations are equivalent for populations of men or those presenting with PGH, where the “red flag” to initiate a work-up is stronger.

PGH is the classic presenting symptom of bladder cancer and should prompt more urgent urologic evaluation. The risk of occult urologic cancer in patients with PGH is consistently >10% and >25% in some referral studies [2–5]. Despite the risk of urologic cancer in patients with hematuria, prior studies have demonstrated substantial variation in practice and referral patterns and have largely relied on interview data, reviews of paper-based medical records, or administrative data sets. This is highlighted in a study that used administrative data noting that cystoscopy was planned after only 34.7% of an estimated 10.8 million hematuria visits to urologists (excluding visits associated with benign diagnoses), leading to an estimated 20,000 missed cancer cases annually among moderate- to high-risk hematuria patients [14]. Administrative data sets are limited as they are unable to provide information in regards to breakdowns in communication and care coordination.

Although there are large variations in urologic referral and work-up of patients presenting with hematuria, the types of process breakdowns remain largely unknown. Integrated EHRs provide easy to access progress notes, test results, referrals, and documentation of communication between PCP and consultants [15]. It is also largely unknown if there is a substantial difference in the evaluation of patients with AMH or PGH each with different “signal strength” as a red flag. A better understanding of the diagnostic evaluation of patients presenting to PCPs with hematuria is essential to help inform additional interventions aimed at improving the quality of care for these patients. We sought to gain new insights into the origin and prevention of diagnostic delays in the evaluation of hematuria in an EHR-based integrated care setting and identify process breakdowns that may contribute to lack of timely diagnosis.

2. Materials and methods

The study was approved by local Institutional Review Boards. We performed a retrospective record review cohort study at a tertiary care Veterans Affairs (VA) facility, which included a multispecialty outpatient clinic, several satellite community based outpatient centers, and primary care clinics. The VA is an integrated health system, and its EHR offers a comprehensive longitudinal picture of the patient’s diagnostic journey. All urology referrals are made to a single urology clinic located at the main campus with an average of 90% of new referrals having access to a new patient clinic visit within 30 days during the study period. To identify the cohort, we performed an EHR query for

hematuria ICD-9 codes for patients presenting to PCPs between 10/1/2011 and 12/31/2013. In doing so, we identified 298 consecutive patients presenting with new-onset hematuria.

2.1. Record review

We stratified patients by the type of hematuria (AMH vs. PGH, as noted at the initial clinic visit), and our primary outcome was receipt of appropriate diagnostic evaluation, which we defined as a urology referral, abdominal imaging, and cystoscopy. One trained physician rater independently reviewed each case using a standardized data collection instrument. We reviewed each patient’s chart for 12 months after their initial primary care clinic visit to assess the diagnostic evaluation as well as the cause of the hematuria including any details documented by providers within the clinic notes. We excluded patients who died within 60 days following diagnosis ($n = 2$), had a known diagnosis of bladder cancer ($n = 0$), had undergone a prior cystectomy ($n = 2$), had active renal stones or UTIs attributed as the cause of their hematuria ($n = 15$), possessed a history of AMH and had undergone cystoscopy within 3 years prior to diagnosis ($n = 21$), were diagnosed with a terminal illness ($n = 8$) within a year prior to hematuria diagnosis or 60 days following hematuria diagnosis, or had pursued care outside the VA within 60 days after diagnosis ($n = 49$).

In addition to our primary outcome, we collected data on demographic information, medical history, and time to diagnostic evaluation. We defined lack of timely diagnostic evaluation as the absence of an appropriate diagnostic evaluation within 60 days from date of presentation with new-onset hematuria at the primary care visit. We also did a separate analysis to assess lack of timely diagnostic evaluation within 90 days of new-onset hematuria. Although these timepoints are arbitrary, we based this definition a priori based on prior literature noting an average time from hematuria claim to bladder cancer diagnosis of 74 days in men [16]. Finally, we documented the reason for lack of timely diagnostic evaluation that could be ascertained from the chart review.

2.2. Analysis

Statistical analysis was performed using Stata 14 (College Station, TX). Comparison of medians was performed using the Mann-Whitney U test. Fisher’s exact and chi-squared tests were used for comparison of categorical variables. We assessed the association of baseline characteristics, diagnostic evaluation of hematuria, and time to diagnostic evaluation stratified by type of hematuria. We performed multivariable logistic and linear regression to assess for independent predictors of no action taken within 60 days and time to diagnostic evaluation respectively. We performed multivariable logistic regression to assess for

Download English Version:

<https://daneshyari.com/en/article/8790111>

Download Persian Version:

<https://daneshyari.com/article/8790111>

[Daneshyari.com](https://daneshyari.com)