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Establishing a Pilot Surveillance System for Venous Thromboembolism

Aaron M. Wendelboe*[1], Janis Campbell[1], Dale Bratzler[1], Michele Beckman[2], Nimia Reyes[2] and Gary Raskob[1]

[1]Biostatistics and Epidemiology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA; [2]Centers for Disease Control and Prevention, Atlanta, GA, USA

Objective

The University of Oklahoma Health Sciences Center (OUHSC) is collaborating with the Centers for Disease Control and Prevention (CDC) to establish a pilot system to inform future scaled-up national surveillance for Venous Thromboembolism (VTE).

Introduction

The U.S. Surgeon General's 2008 Call to Action to Prevent Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE) raised the importance of conducting surveillance for VTE. VTE comprises PE and DVT and collectively is responsible for estimated 350,000–900,000 events and 100,000–300,000 deaths annually in the U.S. However, these estimates are uncertain because no current surveillance is conducted for VTE and thus are derived from cohort studies in selected counties (which often lack racial diversity typical of the U.S.) and then generalized to the U.S population. These estimates are also limited by an inability to differentiate between incident and recurrent events and provoked and non-provoked events. In addition, non-hospitalized patients have not been included in some of these estimates. With the availability of non-invasive and highly sensitive and specific diagnostic procedures of computed tomography (CT) for PE and compression ultrasound (CUS) for DVT, and the implementation of electronic health records, the time is right to establish a surveillance system for VTE events.

Methods

Our pilot is conducting both active and passive surveillance in Oklahoma County, OK beginning April 1, 2012 and incorporates multiple features to improve the quality of the VTE estimates currently available. First, the Oklahoma Commissioner of Health made VTE diagnoses reportable conditions during the surveillance period and delegated to OUHSC the authority to conduct the surveillance. Second, Oklahoma County is representative of the U.S. population by race, and our active surveillance is being conducted in both inpatient and outpatient facilities which had state-registered CT and CUS equipment in the county. Third, we are identifying VTE cases by searching administrative and clinical records for both imaging and ICD-9 codes. Fourth, we are using a tiered case definition based on the amount and quality of the diagnostic data. Specifically, a definite case is positive by imaging [CUS, CT, contrast venography, V/Q scan, or magnetic resonance imaging (MRI)], autopsy, venous thrombectomy, or pulmonary embolectomy. A probable case has indeterminate imaging or imaging was either not available or not done, but the medical record indicates suspicion of VTE and the condition was treated by either anticoagulant therapy or a related procedure, or was listed on the death certificate. A possible case required at least two of the following: ICD-9 code, VTE-related CPT code, ICD-10 code, or Present on Admission code. Finally, we are comparing the data obtained from the review of imaging and ICD-9 coding to compare the number of patients identified by each method. We are employing a number of quality control activities including measuring the inter-rater reliability of reading the imaging reports, randomly sampling both case and non-case patients' records screened by the surveillance officers for reliability of data abstraction, and measuring the contribution of each ICD-9 code in identifying patients with VTE events.

Results

We have conducted surveillance in 11 inpatient facilities and one outpatient facility and have screened 20,988 clinical records to date; 67% by imaging report and 23% by ICD-9 code. Imaging reports take approximately one minute to screen in contrast to 10 minutes for a record flagged by an ICD-9 code.

Conclusions

The most important factor in conducting our surveillance was the collaboration with CDC and the Oklahoma Commissioner of Health. This allowed us to work with all facilities in the county and collect the required information. We have been able to better understand the quality of individual ICD-9 codes in identifying true cases and have found it more efficient for surveillance officers to screen patient imaging records to determine case status than by ICD-9 code. We will also be able to compare the contributions of active and passive surveillance systems in real time as we move forward. As we scale-up this system in the future, we need to better understand how to incentivize hospitals to comply with VTE surveillance activities as quickly as they do with other acute events such as infectious diseases.

Keywords

venous thromboembolism; pulmonary embolism; deep vein thrombosis; incidence; recurrence

*Aaron M. Wendelboe
E-mail: aaron-wendelboe@ouhsc.edu