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Linking Antimicrobial Resistance Surveillance Data to Provincial Hospital Records: A Descriptive Study of Patient and Facility-level Characteristics

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Introduction

Antimicrobial resistance (AMR) is an emerging phenomenon where microorganisms develop resistance against treatment antimicrobials, resulting in ineffective clinical interventions. The recent development of AMR surveillance systems at global and national stages highlights the growing importance of this topic from a public health perspective.

Objectives and Approach

The objective was to link standardized population-based hospital AMR surveillance data with hospitalization records to inform patient safety practices in Alberta, Canada. Incident inpatient cases of Methicillin-Resistant Staphylococcus aureus (MRSA), identified by Alberta Health Services Provincial Infection Prevention and Control (IPC) Surveillance from five acute care facilities in the Calgary zone (April 2011 to March 2016), were deterministically linked to the Discharge Abstract Database using Provincial Healthcare Number and gender. The incident cohort was stratified into hospital-acquired (HA-MRSA) and community-acquired MRSA (CA-MRSA) cases. Descriptive statistics were used to describe the patient outcomes and facility characteristics of these two groups.

Results

A total of 2550 unique patients, representing 93.5% of the surveillance cohort, were successfully linked to hospitalization records. A total of 1259 patients belonged to HA-MRSA categories and 1291 patients belonged to CA-MRSA categories. Patients with HA-MRSA had longer hospital stays, were older, were more likely to have prior hospitalizations, had higher Charlson Comorbidity Scores, and were more likely to die in hospital when compared to patients with CA-MRSA. HA-MRSA results emphasized the important roles of in-hospital patient safety practices whereas CA-MRSA results alluded to the impact of community public health and primary care services on the risk of hospitalization, although detected CA-MRSA numbers were likely underestimated due to selection bias within our linked cohort.

Conclusion/Implications

This is first Canadian study describing HA-MRSA and CA-MRSA using linked population databases. It offers a glimpse into the intricate relationship between patient health and our healthcare system. This knowledge represents an important step forwarding building IPC strategies for managing AMR and improving outcomes in Alberta and in Canada.