Rising Injection-Related Infections amid Declining Overdose Deaths in the Southeast

Authors and Affiliation

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Background

Although opioid overdose deaths have recently stabilized or declined in parts of the southeastern United States, injection-related infections (IRIs) continue to rise. This evolving syndemic of substance use disorder (SUD) and infectious complications is often under-identified due to limitations in ICD-10 coding, provider documentation variability, and underreporting of injection drug use. Consequently, health systems lack reliable tools to quantify IRI burden and evaluate trends.

Objectives

To develop and validate an ICD-10–based algorithm to accurately identify four IRI phenotypes (endocarditis, vertebral osteomyelitis/epidural abscess, bacteremia & deep infections, and skin & soft tissue infections (SSTI)) and to quantify its diagnostic performance against gold-standard manual chart review.

Methods

We conducted a retrospective analysis of a multi-hospital electronic medical record dataset within a single health system from January 1, 2023 to January 1, 2025. Phenotype-specific ICD-10 codes for IRI diagnoses were combined with SUD-related ICD-10 codes and temporally linked evidence of SUD using an iterative modeling approach. Validation was performed through blinded manual chart review by two independent reviewers using predefined adjudication criteria. Inter-rater reliability was assessed using Cohen's kappa. Algorithm performance was summarized using positive predictive value (PPV).

Results

The algorithm identified 710 true positive, 158 suspected positive, and 175 false positive encounters. Strict PPV was 68%, and inclusive PPV was 83%. Inter-rater reliability was strong ($\kappa = 0.86$). Over the study period, IRI encounters increased, while opioid overdose admissions remained stable.

Conclusions

Injection-related infections are rising despite stabilization of overdose admissions in this southeastern health system. A validated ICD-10 algorithm enables scalable identification of IRIs without reliance on structured data fields or natural language processing.

Recommendations

This validated algorithm may strengthen public health surveillance, inform resource allocation, support addiction medicine integration and infectious disease service planning, and enable health system–level monitoring of injection-related infection trends as the opioid crisis evolves beyond overdose mortality alone.

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#7851