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The Diagnosis-Wide Landscape of
Hospital-Acquired AKIAnne-Sophie Jannot^{*,†,‡,§}, Anita Burgun^{*,†,‡,§}, Eric Thervet^{†,‡,||},Nicolas Pallet^{†,‡,||,¶}

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Abstract

Background and objectives The exploration of electronic hospital records offers a unique opportunity to describe in-depth the prevalence of conditions associated with diagnoses at an unprecedented level of comprehensiveness. We used a diagnosis-wide approach, adapted from phenome-wide association studies (PheWAS), to perform an exhaustive analysis of all diagnoses associated with hospital-acquired AKI (HA-AKI) in a French urban tertiary academic hospital over a period of 10 years.

Design, setting, participants, & measurements We retrospectively extracted all diagnoses from an i2b2 (Informatics for Integrating Biology and the Bedside) clinical data warehouse for patients who stayed in this hospital between 2006 and 2015 and had at least two plasma creatinine measurements performed during the first week of their stay. We then analyzed the association between HA-AKI and each International Classification of Diseases (ICD)-10 diagnostic category to draw a comprehensive picture of diagnoses associated with AKI. Hospital stays for 126,736 unique individuals were extracted.

Results Hemodynamic impairment and surgical procedures are the main factors associated with HA-AKI and five clusters of diagnoses were identified: sepsis, heart diseases, polytrauma, liver disease, and cardiovascular surgery. The ICD-10 code corresponding to AKI (N17) was recorded in 30% of the cases with HA-AKI identified, and in this situation, 20% of the diagnoses associated with HA-AKI corresponded to kidney diseases such as tubulointerstitial nephritis, necrotizing vasculitis, or myeloma cast nephropathy. Codes associated with HA-AKI that demonstrated the greatest increase in prevalence with time were related to influenza, polytrauma, and surgery of neoplasms of the genitourinary system.

Conclusions Our approach, derived from PheWAS, is a valuable way to comprehensively identify and classify all of the diagnoses and clusters of diagnoses associated with HA-AKI. Our analysis delivers insights into how diagnoses associated with HA-AKI evolved over time. On the basis of ICD-10 codes, HA-AKI appears largely underestimated in this academic hospital.

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