Implementation and Evaluation of the Prevalence of Low-Value Care Procedures Using the OHDSI Network: A Case Study of Early Peripheral Vascular Interventions for Claudication

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Background

Differences in healthcare systems, reimbursement structures, and healthcare policies across countries may lead to various practice patterns and outcomes, thus necessitating an exploration beyond the confines of a single nation. The OHDSI (Observational Health Data Sciences and Informatics) network offers a unique opportunity to collaborate with institutions and countries globally, enabling comprehensive data integration and analysis.[1] While data from the U.S. has recently raised concerns about the overuse and potential harm associated with early peripheral vascular interventions (PVI) within 6 months of an initial diagnosis of claudication, it remains unclear whether similar patterns are prevalent in other countries.[2,3] To address this critical knowledge gap and to contribute to the growing body of research on low-value care in vascular surgery, we to conduct a global network study within OHDSI to assess and evaluate the prevalence of early PVI for claudication. In this abstract, we report on the evaluation based on a single institution's data of the study protocol.

Methods

We used electronic health record (EHR) data from Johns Hopkins Medicine that was converted to the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM) (version 5.4), to identify patients $\geqslant$18 years of age who were seen by a medical provider with a new diagnosis of claudication between January 2018 to December 2022. We excluded patients with a diagnosis of acute limb ischemia or chronic limb-threatening ischemia before or within 6 months of the initial claudication diagnosis date. We developed two phenotype cohorts in our ATLAS instance: patients who underwent early PVI ($\leqslant$6 months) and those who did not undergo early PVI after their initial diagnosis of claudication. Using previously published studies,[2,3] we mapped ICD-10-CM codes and CPT codes to SNOMED CT standard terminologies as concept sets. For exclusion criteria and comorbidities, concept sets were created for claudication, chronic limb-threatening ischemia (CLTI), smoking, end-stage kidney disease, diabetes, and hypertension. The phenotype cohorts were created and tested using the Johns Hopkins OMOP database and evaluated by vascular clinicians for accuracy. A new feature analyze was created to identify patients who convert to from claudication (mild disease) to CLTI (severe disease) 6 months after the first claudication diagnosis.

Results

5,486 patients (median age 73, IQR 64-84) who had a new diagnosis of claudication were included, of whom 16 (0.3%) underwent early PVI. (**Table 1**) Patients who did not undergo early PVI were more frequently male (52% vs 44%), of black race (24% vs. 19%), and had a higher prevalence of comorbidities including end stage kidney disease (75% vs. 6%), but lower prevalence of diabetes (24% vs. 31%) and hypertension (16% vs. 88%). Patients underwent an early PVI had a higher frequency of conversion to CLTI then these who did not receive an early PVI (44% vs. 24%).

Conclusion

With "low value" defined as early PVI, we successfully demonstrated out ability to leverage the OHDSI framework to evaluate low-value care procedures in vascular surgery within a standardized dataset derived from a single hospital system. Moving forward, JSON codes will be exported and shared with external partners overseas to replicate the cohorts in their databases to allow for comparative analysis across different institutions and countries. The OHDSI framework will enable us to develop of evidence-based strategies designed to enhance the quality and efficiency of vascular surgical care both within the United States and on an international scale.

Table I. Characteristics of patients (N=5486) who underwent peripheral vascular interventions (PVI) for intermittent claudication, stratified by receipt of early vs. non-early PVI.

Patient Characteristics	Patients without an early PVI (N=5470)	Patients with an early PVI (N=16)
Age (years)		
Median (IQR)	73 (64, 84)	74 (60, 80)
≤64	1426 (26.07)	5 (31.25)
65-74	1633 (29.85)	4 (25.00)
75-84	1594 (29.14)	4 (25.00)
≥85	817 (14.94)	3 (18.75)
Male Sex	4153 (51.94)	7 (43.75)
Race		
White	3743 (68.43)	11 (68.75)
Black	1327 (24.26)	3 (18.75)
Other/unknown	400 (7.31)	2 (13.50)
Comorbidities		
ESKD	4148 (75.83)	1 (6.25)
Diabetes	1313 (24.00)	5 (31.25)
Hypertension	864 (15.80)	14 (87.50)
Smoking	27 (0.49)	0
Conversion to CLTI (N, %)	1336 (24.42)	7 (43.75)

Data are presented as number (%), unless otherwise specified. ESKD: End-stage kidney disease, CLTI: Chronic limb-threatening ischemia

Reference

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