



Critical Appraisal of Real-World Evidence on the Clinical and Economic Outcomes Associated with Stent Use in Critical Limb Ischemia

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BACKGROUND

- Given the significant burden of critical limb ischemia (CLI), endovascular interventions with below-the-knee (BTK) stent use remain challenging owing to limited clinical (safety issues) and economic evidence (cost)¹.
- Recognizing that methodological and practical limitations exist in conventional clinical trials, real-world evidence (RWE) is increasingly used for CLI research.

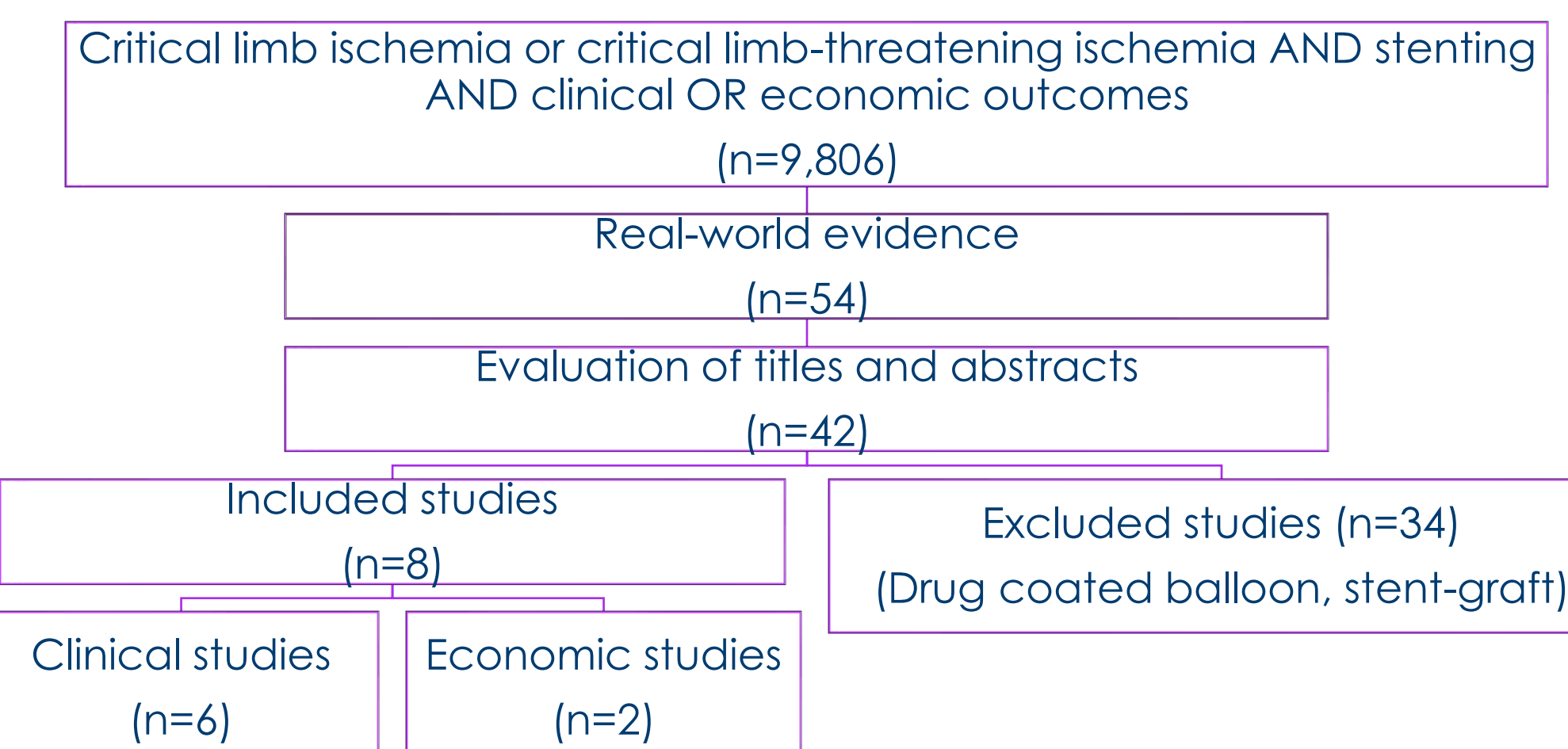
OBJECTIVE

This study assessed the quality and comprehensiveness of RWE on the clinical and economic outcomes associated with below-the-knee (BTK) drug-eluting stents (DES) and bare-metal stents (BMS) in CLI patients.

METHODS

- A systematic literature review was conducted to identify RWE studies for DES and BMS published in the United States between January 2011 and September 2021 (Table 1).
- A critical appraisal of peer-reviewed studies was performed using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist² and the Critical Appraisal Skills Programme (CASP) assessment tool for cohort studies³.

Figure 1. Flow diagram showing study selection



RESULTS

- Of the 42 RWE studies identified, 8 (6 clinical and 2 economic) were critically analyzed: 67% (4) met the STROBE criteria for addressing confounders (Table 2).
- The CASP tool identified:
 - Study design issues (selection bias, confounding)
 - Limited information on the strategies to minimize selection bias
 - Low external validity of the study findings
 - Missing information on the study limitation due to use of observational data
- The STROBE checklist identified:
 - Study design issues (statistical adjustment of confounders, selection of cohort, appropriateness of statistical analyses, representativeness of sample size)
 - Limited information on missing data and missing data not addressed
 - Limited information on minimization of bias and confounders
 - Missing flow chart of included and excluded study participants
 - Threats to external validity due to low sample size and choice of database
 - Missing information on the study limitation due to use of observational data

Table 1. Search Strategy

Keyword concept	Search terms	Filters
Stents	stent OR stents OR drug-eluting stents OR drug eluting stents OR bare-metal stent* OR bare metal stent* OR elut*	United States
CLI	critical limb ischemia OR intermittent claudication OR claudication OR limb ischemia or limb threat* OR (ischaemia AND (leg OR legs OR limb OR limbs)) OR chronic limb threatening ischemia	10 years
Cost	costs and cost analysis OR economics OR economics OR cost savings OR cost-benefit analysis OR hospital costs OR cost-effective* OR costs OR cost OR cost-consequence* OR cost-effective* OR economic* OR economic-based OR cost-saving* quality of life OR QOL	
Clinical outcomes	all-cause mortality OR death OR survival OR mortality OR amputation OR major adverse limb events OR disease-specific mortality OR wound healing OR healed ulcers OR persistent ulcers OR amputat OR limb salvage OR	Human studies
Study design	real-world evidence [Publication Type] OR observational study [Publication Type] OR observational studies as Topic [Mesh] OR retrospective studies/methods [Mesh] OR retrospective studies/standards [Mesh] OR clinical trial	

Table 2. Classification of Stenting Outcomes

Outcomes	Review [References]	N
Limb revascularization	4,5,6,7,8,9,10,11	8
Death	5,6,7,9,10,11	6
Amputation	6,10,11	3
Endovascular revascularization	4,10	2
Cost aspects	4,10	2
Procedural complication	6	1
Major adverse cardiovascular events	6	1

CONCLUSIONS

- This appraisal demonstrates eligible RWE studies are well-designed, statistically powered, and offer reliable evidence to demonstrate a statistical difference to clinicians and payers on the clinical and economic outcomes of BTK DES and BMS in CLI patients.
- However, evidence supporting the economic outcomes of BTK stents is limited.
- Since many decision-makers rely on economic studies to enhance resource decision-making, there is a need for additional healthcare economic data on the value of endovascular interventions for the treatment of CLI.

LIMITATIONS

- Issues with external validity of key findings due to small number of studies appraised.
- Existing critical appraisal tools assess the quality of observational studies and lack RWE-specific components (database quality, reporting of codes).

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DISCLOSURES

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