

Risk Factors for Post-Cardiac Implantable Electronic Devices

Procedure (CIED) Infections: A Systematic Review

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Reference list

Introduction

- Patients with CIED have increased in recent years; increase of 25% from 2013 - 2017 alone.^{1,2}
- Infection rate post-CIED is 1.6% - 5.8%.¹ Increase in CIED procedure means infection cases also increases.
- This study aims to review published articles and establish concrete evidence regarding CIED infection

Method

Literature search

Database:
- PubMed and OVID Medline

Terms:
- "infection" or "Systemic Infection" or "Pocket Infection"
- "Cardiac Implantable Electronic Devices"

Study Selection:

Language:
- English
Study design:
- Case control, cohort study, RCT
Year of publication:
- 2009-2020
Sample:
- CIED patients of any kind

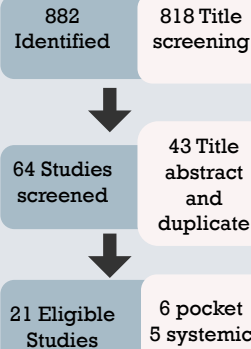


Table 1. Summary of data extraction

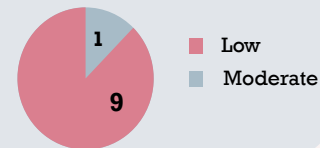
Risk Factors	Systemic infection	Pocket infection
Renal failure	7-33%* HR: 4.88*; ² [2.77-8.60] ³⁻⁷	15.3% ⁵
Heart failure	35-49%* ^{3,5-7}	-
Respiratory failure	11-25%* ^{3,5,6}	3.4%* ⁵
Diabetes	25-50%* HR: 1.73*; ² [1.22-2.45] ^{3-5,7}	28%-30.5% ^{5,8} HR: 1.28; ² [0.91-0.80] ⁷
CIED replacement	-	38%* ⁵ OR: 3.8*; ² [1.5-5.5] ⁸
CIED upgrade	-	23.7%* ⁵
Previous CIED procedure	40.3% 1.04±1.12* ^{6,7}	1.68±1.14* ⁵ HR: 1.21*; ² [1.06-1.40] ⁷
Age	64-73* 64.59 ± 14.82 ³⁻⁷	65* ⁸
Gender (Male)	60-68% HR: 1.57* [1.16-2.13] ³⁻⁷	69.2 ⁵ HR: 1.98*; ² [1.42-2.70] ⁷

*: p-value ≤ 0.05

Key Findings

- Low sample size in several studies
- Large population gap among the studies
- Different method of measurement:
effect size vs the prevalence vs mean difference
- No systemic infection studies observe CIED procedure
- Age and gender were a common denominator
- Organ failure most commonly associated with systemic infection
- Pocket infection most commonly associated with CIED procedures

Risk of bias
(ROBBINS-I):



Conclusion

Organ malfunction increases risk of systemic infection, and increased exposure of CIED pocket to the external milieu increases pocket infection risk.

Further discussion needs to be conducted.