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Making the Cut: Perspectives on the Surgical Management of Infective Endocarditis Among People Who Use Intravenous Drugs

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ABSTRACT

In this article we review the perspectives in the literature around surgical treatment for infective endocarditis (IE) in people who use intravenous drugs (PUID). PUID are at increased risk for IE; however, controversy exists regarding how to best manage these patients. We explore the outcomes for surgical treatment in PUID with IE, contrasting these with patients with IE who do not use drugs. We describe some of the perspectives in the literature around second valve replacement for PUID with IE, arguing that moralistic arguments are not on the basis of evidence and perpetuate the stigma experienced by PUID who seek treatment for IE. Finally, we explore the role of substance use interventions in the treatment of PUID with IE, and

RÉSUMÉ

Dans cet article, nous passons en revue les différents points de vue présentés dans la littérature sur le traitement chirurgical de l'endocardite infectieuse (EI) chez les consommateurs de drogues intraveineuses (CDI). Ces personnes sont associées à un risque accru d'EI; il existe cependant une controverse quant à leur prise en charge optimale. Nous examinons les résultats obtenus dans la prise en charge chirurgicale des CDI qui présentent une EI, par comparaison avec des patients présentant une EI qui ne font pas usage de drogues. Nous exposons quelques points de vue recueillis dans la littérature concernant le recours à une deuxième chirurgie de remplacement valvulaire chez les CDI qui présentent une EI, faisant valoir que les

A 32-year-old woman is admitted with sepsis, and is diagnosed with mitral valve endocarditis. Investigations reveal methicillin-resistant *Staphylococcus aureus* bacteremia (3/3 blood cultures) and a 12-mm vegetation on the anterior mitral valve on echocardiogram. She reports a history of opioid use with current use of street fentanyl daily via injection. The cardiovascular surgery service is consulted for an opinion regarding surgical management. The consulting surgeon agrees that surgery might be required but is concerned about the potential for reinfection because of the patient's history of injecting drugs.

Background: Infective Endocarditis and People Who Use Intravenous Drugs

Infective endocarditis (IE) is a bacterial or fungal infection of the heart valves or mural endocardium. The estimated annual incidence of IE in the general population is 1.7-6.2 cases per 100,000 patients.[1] People who use intravenous drugs (PUID) are at increased risk for IE and IE is estimated to be responsible for 5%-10% of deaths among PUID.[1]

Uncertainty in the Data: Outcomes for Surgical Treatment of IE in PUID

Most patients with IE are treated conservatively with antibiotics, however, some will require valve repair or replacement surgery for effective treatment. Data regarding

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advocate for further evidence. PUID with IE are a highly stigmatized patient subgroup for whom best practice management strategies are not always implemented, emphasizing the need for further research and advocacy.

arguments moralistes ne reposent pas sur des données probantes et qu'ils perpétuent la stigmatisation dont font l'objet les CDI qui présentent une EI et souhaitent se faire traiter. Enfin, nous examinons le rôle des interventions relatives à la consommation de substances dans la prise en charge des CDI présentant une EI, et recommandons davantage de données probantes. Les CDI présentant une EI forment un sous-groupe de patients fortement stigmatisés pour qui les stratégies de gestion des meilleures pratiques ne sont pas toujours mises en œuvre, ce qui souligne la nécessité de poursuivre les recherches et de mettre en place des mécanismes de défense des intérêts.

long-term outcomes for IE in PUID who undergo surgical treatment are scarce[2] and often conflicting[3] (Table 1). Some studies report similar short- and long-term outcomes for PUID and other patients treated for IE. In a retrospective cohort of PUID with IE who underwent surgery (n = 80), survival at discharge, 3 years and 5 years post surgery was 92.5%, 74%, and 70%, respectively.[4] These survival rates are comparable with those in a retrospective cohort study of patients with IE who did not use intravenous drugs (n = 133), with survival at 1, 2, and 4 years postsurgery of 83%, 78.1%, and 72%, respectively.[2] The average age in the PUID cohort was 37.5 years, and 48.4 years in the non-PUID cohort.[2,4]

Other studies have shown worse long-term outcomes for PUID, including higher rates of reinfection or reoperation. A 2015 study of 536 patients with IE who underwent surgical intervention showed that the cohort of 41 PUID initially did well after surgery, however had a high risk period for death or relapse between 3 and 6 months after surgery.[3] Patients who survived this period subsequently had a risk of death or relapse comparable with patients with IE who did not use intravenous drugs.[3] Patients who did not use intravenous drugs had a similar cumulative incidence of death as PUID but a significantly lower cumulative incidence of reoperation for IE.[3]

Despite the Evidence, PUID Are Treated Differently

No high-quality evidence exists to inform decision-making; the available research in this area is largely uncontrolled and retrospective. The literature reflects discrepancies in approaches regarding the management of IE in PUID, particularly when surgical management is indicated. A number of articles have explored the ethical dimensions of providing repeat surgery for PUID with repeat IE, and suggest a range of approaches to treating these patients. Despite this and the lack of compelling evidence that PUID should be approached differently, the role of surgical management in these patients appears to vary according to provider preference and institutional policy.

It is essential to acknowledge the stigma faced by PUID in health care settings, and how this might influence the treatment they receive. Some of the challenges that PUID might face when seeking health care include use of pejorative language by health care providers, the perception of personal responsibility for substance use disorders, inadequate access to harm reduction supplies (including sterile needles), and inadequate management of withdrawal. The attribution of personal responsibility for substance use that is often placed on PUID has contributed to some authors justifying a weaker claim to the utilization of health care resources in this group. Such perspectives risk overemphasizing the role of individual choice, without acknowledgement of multitude of social and systemic factors shown to influence and constrain individual choices, and ultimately health outcomes.

A Poorly Managed Comorbidity: Inadequate Substance Use Care for PUID With IE

Few articles make mention of the role of substance use interventions in the management of PUID with IE. In a retrospective cohort of 102 PUID with IE, only 23.7% had an

Table 1. Summary of the outcomes for surgical treatment of IE in PUID

Reference	Study design	Sample size	Number of PUID	Outcomes for PUID vs control (if available)
Mathew et al.[4]	Retrospective cohort	80	80	Survival rates are for discharge from hospital (92.5%), 3 years (74%) and 5 years post surgery (70%)
Rabkin et al.[2]	Retrospective cohort	197	64	Survival for PUID at 30 days, 1, 5, and 10 years post surgery was 91.2%, 77.5%, 46.7%, and 41.1%, respectively. Survival for patients who did not use intravenous drugs at 30 days, 1, 5, and 10 years post surgery of 93.6%, 83%, 71.7%, and 52%, respectively
Shrestha et al.[3]	Retrospective cohort	536	41	PUID who underwent surgery for IE initially did well after surgery, however, they had a very high risk period for death or relapse between 3 and 6 months after surgery. Patients who survived this period had a risk of death or relapse comparable with the non-PUID group. Patients who did not inject drugs had a similar cumulative incidence of death as PUID but a significantly lower cumulative incidence of reoperation for IE

IE, infective endocarditis; PUID, people who use intravenous drugs.

addiction consult on admission, and only 55.9% of discharge summaries mentioned addiction.[5] Harm reduction approaches, which aim to reduce the adverse consequences of substance use, are also absent from much of the literature, but are an important considerations in reducing some of the risk of reinfection in patients who continue to use substances after an episode of IE. Such approaches include opioid substitution therapy, providing access to sterile injection equipment (in-hospital and in the community), and destigmatizing interventions that provide education to health care teams around reducing barriers and stigma for patients who use drugs, informed by perspectives from patients with lived experience.

Future Directions

The surgical management of IE in PUID is a challenging issue for which best practices are not well established or uniformly implemented. There is a lack of high-quality evidence showing that PUID should be treated any differently than those who do not use intravenous drugs with the same disease. Areas for further study include best practices for substance use interventions in PUID with IE, such as harm reduction interventions and the use of multidisciplinary teams to support these patients during and after hospitalization. As well, it is a priority to describe the outcomes of PUID for whom surgery is indicated but who refuse or are refused surgical intervention. The prognosis of this subgroup of patients is currently understudied, but could help to inform ongoing discussions about the implications of surgical management decisions in this patient population. Finally, further exploration of the perspectives of front-line providers would assist in understanding the barriers to high-quality treatment in this patient population.

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References

1. Weymann A, Borst T, Popov A-F, et al. Surgical treatment of infective endocarditis in active intravenous drug users: a justified procedure? J Cardiothorac Surg 2014;9:58.
2. Rabkin DG, Mokadam NA, Miller DW, et al. Long-term outcome for the surgical treatment of infective endocarditis with a focus on intravenous drug users. Ann Thorac Surg 2012;93:51-7.
3. Shrestha NK, Jue J, Hussain ST, et al. Injection drug use and outcomes after surgical intervention for infective endocarditis. Ann Thorac Surg 2015;100:875-82.
4. Mathew J, Abreo G, Namburi K, Narra L, Franklin C. Results of surgical treatment for infective endocarditis in intravenous drug users. Chest 1995;108:73-7.
5. Rosenthal ES, Karchmer AW, Theisen-Toupal J, Castillo RA, Rowley CF. Suboptimal addiction interventions for patients hospitalized with injection drug use-associated infective endocarditis. Am J Med 2016;129:481-5.