American Journal of Preventive Cardiology 19 (2024) 100716

Contents lists available at ScienceDirect

American Journal of Preventive Cardiology

journal homepage: www.journals.elsevier.com/american-journal-of-preventive-cardiology

Cardiology patients are unaware of the benefits of seasonal influenza immunization

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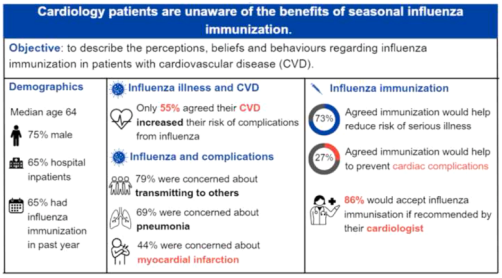
GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Influenza immunization
Cardiovascular prevention
ASCVD
Patients

ABSTRACT

Seasonal influenza immunization reduces the risk of cardiovascular events. Patients with established cardiovascular disease (CVD) derive a greater benefit than those without, yet up to 50 % do not take up the immunization. Patient perceptions and beliefs are known to inform immunization behaviors, yet the immunization related beliefs of patients with CVD have not been described.

Objective: To describe beliefs, perceptions and behaviors regarding influenza immunization in patients with CVD.

Methods: We undertook a cross-sectional, voluntary and anonymous survey of 181 cardiology inpatients and outpatients attending three large hospitals in Victoria.

Results: Median age was 64, 35.0 % were female and 24.2 % spoke a language other than English at home. Over one-third-(34.5 %) of respondents did not receive the seasonal influenza immunization in the prior year. Only half (54.2 %) of patients agreed that their heart condition placed them at higher risk of complications and serious illness if they contracted influenza. Nearly a quarter of patients (24.0 %) were concerned about side effects while 1 in 10 patients raised cost as a barrier despite being free-of-charge in Australia. If asked to receive the seasonal influenza immunization, 86 % patients would agree if their cardiologist recommended it.

Conclusion: Despite guideline recommendations, most cardiology patients are uninformed of the cardiovascular benefits of seasonal influenza immunization with many unaware they are at higher risk of influenza-related illness. The vast majority of patients would accept the immunization if recommended by their cardiologist highlighting their important role in improving uptake.

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https://doi.org/10.1016/j.ajpc.2024.100716
Received 16 April 2024; Received in revised form 12 July 2024; Accepted 8 August 2024
Available online 13 August 2024

1. Background

Influenza infection is associated with increased cardiovascular events and premature mortality, particularly among patients with established cardiovascular disease (CVD). Systematic reviews demonstrate influenza immunization reduces the risk of adverse cardiovascular events with a larger effect seen among those with acute coronary syndrome [1]. However, up to one-third-of patients with CVD do not receive influenza immunization [2]. Patient beliefs, and behaviors regarding influenza immunization are well described in the general population, with important positive predictors of uptake including perception of self as vulnerable to a harmful disease, understanding that the immunization is effective and receipt of recommendation by healthcare practitioners. Given patients with CVD have more to gain from immunization uptake but may be preoccupied with other elements of risk factor modification, the objective of this study was to describe the beliefs and perceptions regarding influenza immunization in a population specifically with CVD.

2. Methods

A cross-sectional, voluntary and anonymous survey was administered to consecutive cardiology inpatients and outpatients attending three Victorian hospitals in Australia during the influenza season, May 1st 2022 to August 31st 2022. Patients were recruited from inpatient cardiology wards, general cardiology clinic, heart failure clinic and arrhythmia clinic. Approval for this study was provided by Monash Health Human Research Ethics Committee (MonH-2022–314,026). Demographics, employment status, educational attainment and prior immunization history were collected. Questions on perceptions and beliefs around seasonal influenza immunization and influenza-related illness were presented using 5-point Likert scale. Subgroups were compared using Chi squared test.

3. Results

A total of 181 surveys were completed; median age was 64 (<65 years = 50.5 %), 35.4 % were female (64/181) and 65 % of the population were inpatients (115/177). One-quarter spoke a language other than English at home (43/178, 24.2 %) and half listed high school as their highest level of educational attainment (90/178, 51.7 %). Over one-third-of respondents did not receive the immunization in the prior year (63/181, 34.5 %) and one in five hadn't received it in the past 5 years (19.6 %, 35/179). Immunization in the prior year was lower among individuals <65 years vs. ≥65 years of age (55.1 % vs 78.1 %, $p < 0.001$) and high-school vs. university education attainment (55.6 vs. 75.5 %, $p < 0.001$) with a trend towards lower rates among those who spoke a language other than English at home (vs. English at home) (55.8 vs. 68.2 %, $p = 0.139$). Males and females were similarly immunized (67.5 % vs. 61.9 %, $p = 0.458$) as were those reporting employment vs. unemployment (56.8 vs. 57.4 %, $p = 0.873$). Only half (97/179, 54.2 %) of patients agreed that their heart condition placed them at higher risk of complications or serious illness if they contracted influenza (Fig. 1). While the majority (132/180, 73.3 %) agreed that influenza immunization would decrease the risk of serious illness, only one-quarter 26.8 % (48/179) agreed that it would help to prevent cardiac complications. Three-quarters (78.6 %, 139/179) of patients were worried about passing influenza on to family and friends. Two-thirds of patients were concerned about pneumonia requiring hospitalization (69.4 %, 125/180). However, less than half (43.8 %, 79/180) were concerned about having a myocardial infarction ("heart attack"). Nearly a quarter of patients (24.0 %) were concerned about side effects while 1 in 10 patients raised cost as a barrier despite being free-of-charge in Australia. If asked to receive influenza immunization, 86 % (154/179) patients would agree if their cardiologist recommended it.

4. Discussion

To our knowledge, this is the first study describing the perceptions of cardiovascular patients to influenza illness, immunization and cardiovascular complications and has several key findings: cardiovascular patients underappreciate their heightened risk for influenza complications, are largely unaware of the incremental benefits afforded by influenza immunization and would be willing to receive the immunization if recommended by their cardiologist.

Low perceived risk of infection and low apparent benefit of immunization are recognized to undermine uptake of immunization among high-risk patient cohorts. In a contemporary survey of 408 Canadian patients aged 18–65 with chronic medical conditions, low perceived risk of influenza (reported by 35.8 %) and low perceived benefit of immunization (reported by 27.4 %) were the most cited reasons for non-immunization [3]. Our data suggests the same is true for patients with CVD in that less than half were concerned about cardiovascular complications of influenza, and only one-quarter believed that influenza immunization would reduce that risk. Programs designed to increase influenza uptake among cardiovascular patients may be more effective if focused on the cardiac-specific impact of the infection and the immunization. One example is the NUDGE-FLU implementation trial, whereby electronic letters informed by nine different behavioral science principles were delivered to Danish citizens nationwide. Immunization rates were highest among those who received a letter emphasizing the cardiovascular benefits and was magnified in respondents who had not been immunized the previous season [4]. Moreover, education programs need to consider vulnerable groups in whom lower rates of immunization were recorded in our survey such as those from culturally and linguistically diverse backgrounds, younger patients and those with lower educational attainment.

Despite most patients underestimating the cardiovascular complications of influenza, almost 90 % of patients would get immunized if their cardiologist recommended it. This is in keeping with previous data

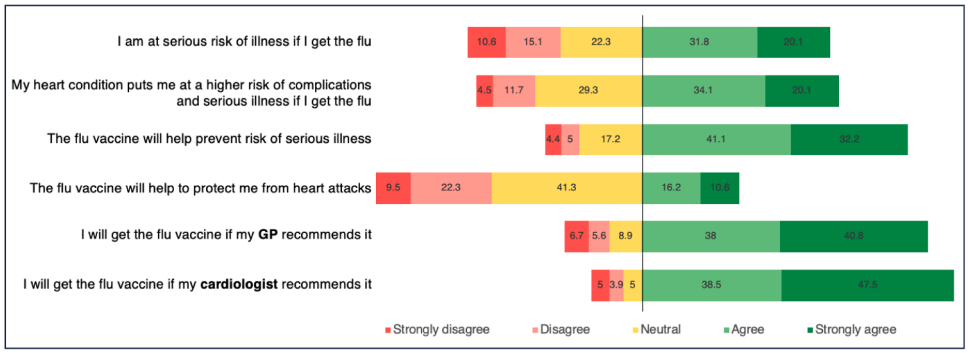

Fig. 1. Distribution of responses (strongly agree to strongly disagree) regarding influenza ilness and immunisation.

suggesting practitioner recommendation is a strong predictor of receipt of immunization, especially in high-risk groups with a disease specific indication [5]. Integrating immunization counselling into routine cardiovascular care may be an important mechanism to increase uptake among cardiovascular patients however this will require a concerted effort given our prior work suggests cardiologists' frequently overlook influenza immunization and defer ownership to primary-care practitioners [6].

There are limitations to our study. Firstly, the small sample size may limit generalizability and external validity of our findings. Second, this study was administered in a healthcare setting, thus may be susceptible to selection and response bias. However, an important strength of this study is that it was performed in a healthcare system in which influenza immunization is free for patients with CVD. While cost may represent an important barrier to immunization in some healthcare settings, our results are more likely to reflect direct patient perceptions with this barrier removed, rather than the indirect impact of patient perception and access.

5. Conclusion

In summary, multiple gaps exist in cardiovascular patients' understanding of the threat posed by influenza infection and the benefits of immunization. Directed education efforts are required at both patients as well as their cardiologists' whose recommendation is likely to be persuasive among these high-risk patients.

Disclosures

S.J.N. has received research support from AstraZeneca, Amgen, Anthera, CSL Behring, Cerenis, Eli Lilly, Esperion, Resverlogix, New Amsterdam Pharma, Novartis, InfraReDx and Sanofi-Regeneron. S.J.N. is also a consultant for Amgen, Akcea, AstraZeneca, Boehringer Ingelheim, CSL Behring, Eli Lilly, Esperion, Kowa, Merck, Takeda, Pfizer, Sanofi- Regeneron, Vaxxinity, CSL Sequiris, and Novo Nordisk. A.J.N. has received research support and consulting fees from Amgen and Novartis. All other authors have no relationships to disclose.

CRediT authorship contribution statement

Sarah R. Monagle: Writing – original draft, Formal analysis. **Ella Spear:** Writing – review & editing, Data curation. **Timothy Abrahams:** Writing – review & editing, Data curation. **Udit Thakur:** Writing – review & editing, Formal analysis, Data curation. **Derk Pol:** Writing – review & editing, Data curation. **Karen Bellamy:** Writing – review & editing. **Joanne Hickman:** Writing – review & editing. **Stephen J. Nicholls:** Writing – review & editing, Supervision. **Adam J. Nelson:** Writing – review & editing, Supervision, Project administration, Investigation, Data curation, Conceptualization.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

ADAM NELSON reports a relationship with Sanofi Pasteur Inc that includes: consulting or advisory. S.J.N. has received research support from AstraZeneca, Amgen, Anthera, CSL Behring, Cerenis, Eli Lilly, Esperion, Resverlogix, New Amsterdam Pharma, Novartis, InfraReDx and Sanofi-Regeneron. S.J.N. is also a consultant for Amgen, Akcea, AstraZeneca, Boehringer Ingelheim, CSL Behring, Eli Lilly, Esperion, Kowa, Merck, Takeda, Pfizer, Sanofi- Regeneron, Vaxxinity, CSL Sequiris, and Novo Nordisk. A.J.N. has received research support and consulting fees from Amgen, Sanofi and Novartis. All other authors have no relationships to disclose. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ajpc.2024.100716.

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