

Post-cardiac surgery outcomes following COVID-19 infection in unvaccinated patients

Cheong Ping Pau, MRCS, Nur Aziah Ismail, MRCS, Aimie Razali, MBBS, Abdul Rais Sanusi, FRCS, Mohd Azhari Yakub, FRCS, Mohamed Ezani Md Taib, FRCS, Alwi Mohamed Yunus, FRCS

Institut Jantung Negara

SUMMARY

The provision of cardiac surgery services nationwide has been affected by the COVID-19 pandemic. We noticed a high COVID-19 mortality rate in unvaccinated patients who were diagnosed with COVID-19 after recent cardiac surgery. All the patients were tested negative for COVID-19 before surgery. We conducted a review of our hospital data and reported our findings. We identified 15 patients and reported 7 deaths (46.7%). All the patients died from COVID-19 or its complications. We recommend that cardiac centres actively promote vaccination before cardiac surgery and also enhance infection control measures to prevent nosocomial infections.

INTRODUCTION

Cardiac surgery is a resource intensive service due to the high utilisation of ICU (intensive care unit) beds. COVID-19 infection post-cardiac surgery appears to have an increased mortality, up to 43% in small case series in other countries.¹⁻³ This article aims to describe the clinical outcomes of patients

who were infected with COVID-19 after cardiac surgery in Malaysia.

METHODS

This was a cross-sectional study conducted at Institut Jantung Negara (National Heart Institute) from October 2020 till July 2021. We included all adults who were diagnosed with COVID-19 after surgery. Our cohort of patients were mostly unvaccinated as the national vaccination rate in July 2021 was 8%.⁴

This cohort included patients having a positive test during the after surgery within the same admission, or patients testing positive for COVID-19 following discharge within six weeks after surgery. Patients in the latter group were admitted to another hospital for COVID-19 treatment. Records were collected by reviewing medical records and phone calls

The methodology is described in Figure 1.

Table I: Demographics of patients with Covid-19 post-cardiac surgery

Variables, n=15		n (%)
Age	<50	1 (6.67)
	51-59	4 (26.7)
	60-69	6 (40)
	≥70	4 (26.7)
Gender, male		11 (73.4)
Chronic renal disease		11 (73.4)
Previous renal transplant		1 (6.67)
Obesity (BMI > 25)		4 (26.7)
Euroscore II	<2	5 (33.3)
	2-4	8 (53.3)
	≥4	2 (13.3)
Ejection fraction	≤50	9 (60)
	>50	6 (40)
Type of operation	CABG only	9 (60)
	Valve only	2 (13.3)
	Surgery on aorta	2 (13.3)
	CABG + valve	1 (6.65)
	CABG + septal myomectomy	1 (6.65)
Urgent operation		3 (20)
Days between surgery and Covid-19 diagnosis	<5	2 (13.3)
	5-10	5 (33.3)
	11-20	6 (40)
	>20	2 (13.3)
Source of infection	Another patient	5 (33.3)
	Family member	2 (13.3)
	Community	4 (26.6)
	Unsure	4 (26.6)

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Corresponding Author: Cheong Ping Pau

Email: cheongping_pau@hotmail.com

Table II: In-hospital events of patients with Covid-19 post-cardiac surgery

In-hospital events (n=12)		n (%)
ICU admission		7 (58.3)
Intubation		2 (16.6)
Non-invasive ventilation		4 (33.3)
Deaths		7 (46.7)
Mode of death	ARDS	2 (16.6)
	Pulmonary embolism	1 (8.3)
	Septic shock	1 (8.3)
	Unclassified	3 (20)

ARDS: Acute respiratory distress syndrome. Mode of death was unclassified for three patients who died in rural hospitals.

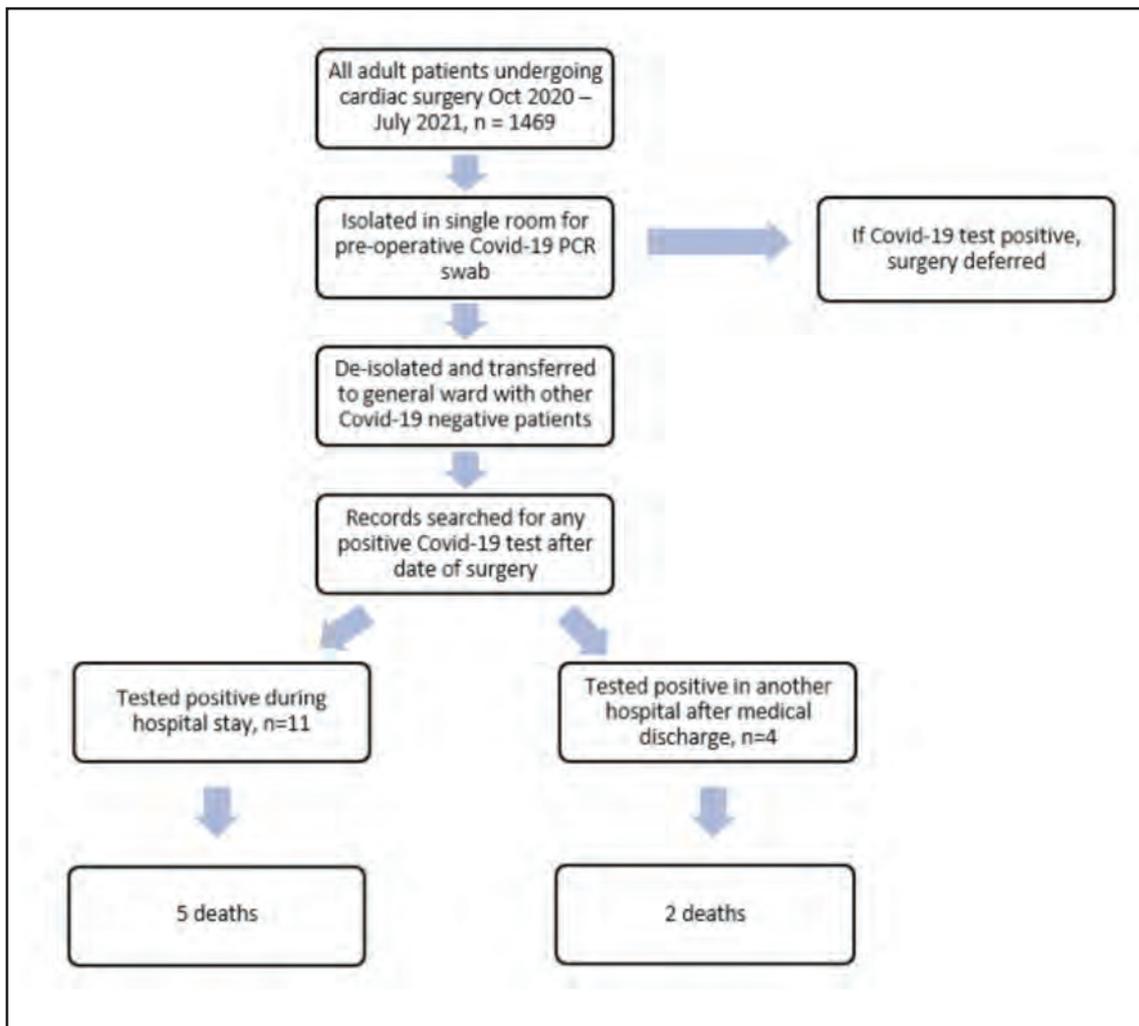


Fig. 1: Methodology.

RESULTS

We identified 15 patients who fulfilled our inclusion criteria. The demographic details are described in Table I.

The patient outcomes are described in Table II. We identified 10 cases of nosocomial infection in our group, out of the 1469 patients who underwent surgery. The total nosocomial infection rate was 0.61%.

We found two early infections that occurred within the first 2 days after heart surgery. Both patients were clinically

asymptomatic but the repeat COVID-19 swab was taken due to contact tracing. This may have been due to a false negative pre-operative COVID-19 swab during the window period.

DISCUSSION

Despite the COVID-19 pandemic, cardiac surgery services need to be continued. Cardiac surgery is life saving, and patients can have good long-term outcomes with successful surgery.

In our group of patients, the overall mortality rate was very high, i.e., at 46.7%, compared to the national 7-day average mortality of $\leq 2.1\%$ during the same time period.⁵ These mortality figures are comparable to a similar-sized cohort in the UK, which had a mortality rate of 37.1%.² In each of the cases within our cohort, the comorbidities of patients who died and survived were similar.

The risk of nosocomial infection appears to be low⁶ in our hospital, allowing the majority of patients to receive adequate and timely treatment for their heart disease. However, each case of nosocomial infection substantially increases the cost of healthcare. Within our hospital, there have been multiple anecdotal cases of patients who have died from heart disease as a result of postponing cardiac surgery due to COVID-19 quarantine.

Some of the limitations of this study are the potential for recall bias from patients who died in rural hospitals. Genetic testing for variants of COVID-19 was not done due to resource constraints. The antiviral and immunomodulatory treatments were also not standardised.

On top of the COVID-19 PCR testing before surgery, our hospital has started rapid antigen testing on the night before surgery to reduce the false negative rate.

CONCLUSION

Due to the high mortality risk of COVID-19 after cardiac surgery in unvaccinated adults, we recommend that patients are vaccinated before surgery.^{7,8} Additional resource allocation for infection control should also be considered for cardiac centres to manage this high-risk group. We also recommend regular auditing and review of hospital and national infection control policies. A good balance needs to be made as an overzealous infection control policy can harm patients by delaying treatment for heart disease. Further studies need to be done to compare the protective effects of vaccination on this cohort of patients.

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