

SHORT COMMUNICATION



The impact of the COVID-19 pandemic on rheumatic heart disease

Susy Kotit

Rheumatic Heart Disease Project Department, Aswan Heart Centre, Egypt

ABSTRACT

The COVID-19 pandemic has significantly impacted cardiovascular disease, particularly rheumatic heart disease (RHD). Importantly, RHD has been shown to be a significant risk factor for the prognosis of COVID-19, with severe valvular heart disease leading to poorer clinical outcomes of COVID-19 infection. Regardless, interest and prioritization of RHD in the world agenda remain low, even after the pandemic. Medical appointments, compliance with medical treatment, and prophylaxis should be encouraged. Prioritization of RHD research and efforts to improve diagnosis, treatment, prevention, and care are warranted.

KEYWORDS

Rheumatic heart disease;
Covid-19; Pandemic;
Cardiovascular diseases;
Healthcare

ARTICLE HISTORY

Received 9 May 2023;
Revised 31 August 2023;
Accepted 14 September
2023

Introduction

The COVID-19 pandemic has significantly impacted cardiovascular disease, particularly rheumatic heart disease (RHD) [1,2], due to the disruption in healthcare services. Importantly, RHD has been shown to be a significant risk factor for the prognosis of COVID-19 [3-8], as patients with severe valvular heart disease who contract COVID-19 have poorer clinical outcomes than age-matched patients without valve disease [9]. This is alarming as the majority of RHD patients have significant valvular heart disease and live in areas with limited healthcare resources. Regardless, interest and prioritization of RHD in the world agenda remain low, even after the pandemic.

In 2016, RHD accounted for over 33.4 million cases and 319,400 deaths [10], with 10.5 million disability-adjusted life-years [10,11]. The incidence of RHD was reported the highest in Oceania, central sub-Saharan Africa, and South Asia, with around 444 cases per 100,000 in endemic countries [10]. However, estimates are that the RHD burden could be as much as double that reported, reaching up to 50 to 80 million persons currently affected with RHD worldwide with an increasing prevalence in low, low- middle, and middle socio-demographic index areas and significant divergence in the burden of RHD among countries based on SDI levels [10,12,13]. Regardless, related research represents only 0.1% of all global health funding [11].

The pandemic has led to the disruption of hospital systems, which has had the biggest impact on populations living with chronic heart disease in low- and middle-income countries. Outpatient clinic visits have been hindered by COVID restrictions and the decrease of the RHD task force and medical services due to the diversion of priorities and resources. Virtual consultation, telehealth, and video counseling have become a trend in many parts of the world, but due to the lack of resources and patient factors, these are not feasible in the areas most affected by RHD. Therefore, medical appointments and follow-up for RHD have remained low, even with the gradual return of services.

Continuation of prescribed medication and proper medical treatment should be encouraged at all times. Discontinuation of antihypertensive pharmacotherapy due to the fear of angiotensin-converting enzyme inhibitors (ACEI) favoring virus infection (Figures 1 and 2) [14-18] is not recommended as the risk-benefit ratio associated with the use of ACEIs and angiotensin II receptor blockers (ARBs) suggests benefits in their maintenance [19,20].

Drug shortages are becoming an increasingly common problem in healthcare, even prior to COVID-19, especially for medication used in the management of cardiovascular disease. With the further disruption of the global supply chains due to the pandemic and the current economic upheaval, this shortage has been expected to be even more evident, causing therapeutic turbulence and the need to switch among drugs within the same class, which has had a negative impact on patient adherence and outcomes [21].

Many RHD patients having atrial fibrillation or a history of heart valve replacement are on anticoagulants like warfarin and require frequent international normalized ratio (INR) tests to remain within therapeutic range and prevent risks of bleeding, thrombosis of the mechanical valve, and adverse cerebrovascular events [22]. However, patients might have limited access to the services, and the test may be unavailable due to the decreased capacity of the health services, which could lead to devastating consequences. Home testing of INR to avoid hospital visits is generally unavailable in low- and middle-income countries or is too expensive for most patients.

Secondary prophylaxis to prevent recurrent attacks of RF and progression of RHD, which is the cornerstone of guideline-based management and standard care of the disease, requires an intra-muscular injection of benzathine penicillin G (BPG) every 2 or 3 weeks [23-27]. Due to limited stock and curtailed hospital services during the pandemic, patients might have faced difficulties in taking this injection.

*Correspondence: Dr. Susy Kotit, Chief, Rheumatic Heart Disease Project Department, Aswan Heart Centre, Egypt; e-mail: susykotit@hotmail.com

Prioritizing the provision of RHD secondary prophylaxis as essential care should be encouraged, and all efforts should be made to promote continuation and prevent interruption of prophylaxis delivery. Oral penicillin, although unequivocally inferior, may be used as an alternative in secondary prophylaxis if penicillin injection is not available, but this is not common knowledge to patients.

The significance of delay in surgical and catheter-based interventions in patients with RHD during the pandemic

should not be disregarded and is a result of the disruption in 'elective' procedures and the visits by teams from abroad on which many low- and middle-income countries rely. Unemployment, reduced income, and the unprecedented economic impact of the pandemic and the current global financial crisis might have consequences on the use of prescription medication, penicillin prophylaxis, as well as medical seeking behavior, leading to an increase in overall risk.

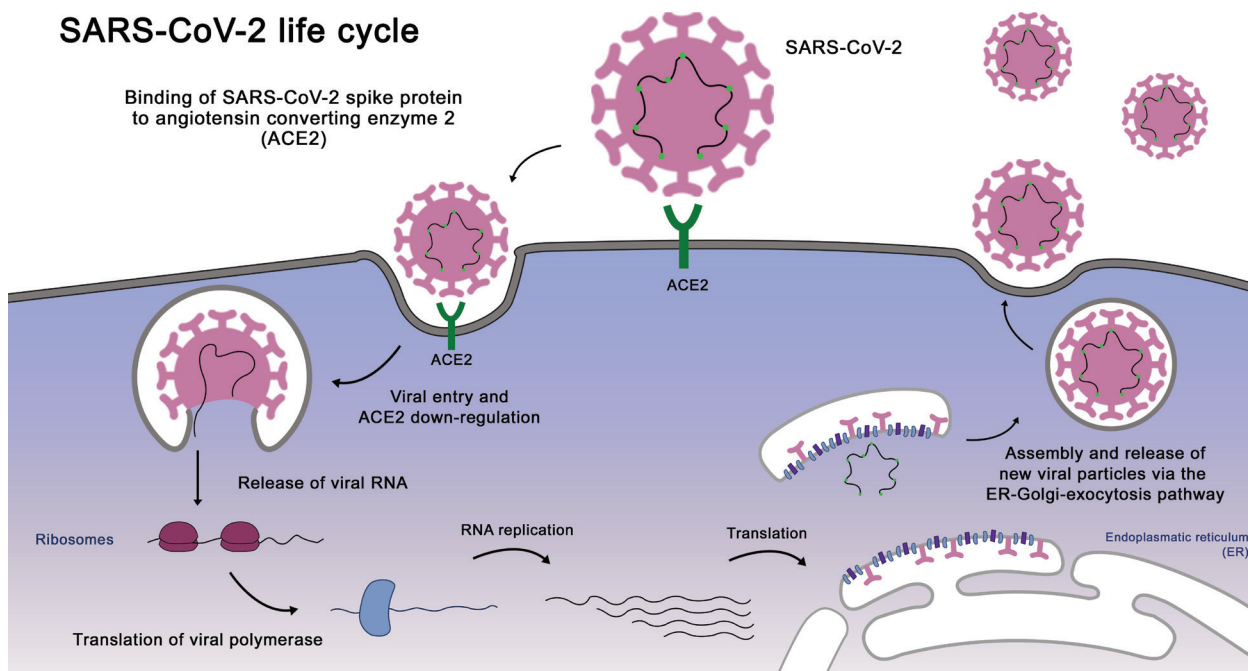


Figure 1. Depiction of the SARS-CoV-2 life cycle showing facilitation of the entrance of SARS-CoV-2 into cells through ACEII receptors.

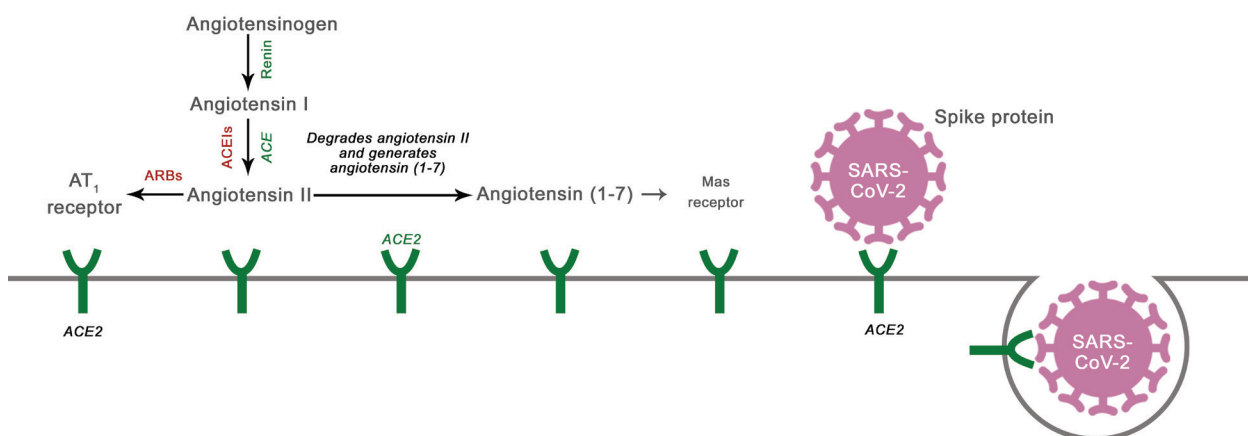


Figure 2. The role of ACEII in SARS-CoV-2 infection.

ACE II (green) regulates the levels of angiotensin II and is the functional receptor for SARS-CoV-2, facilitating viral entry into cells. Theoretically, pharmacologic RAS blockade with ACEIs or ARBs (red) could lead to an increase in ACEII available for viral binding. ACE2= angiotensin-converting enzyme 2; ACEI= angiotensin-converting enzyme inhibitor; ARB= angiotensin-receptor blocker; AT1= type 1 angiotensin receptor; RAS= renin-angiotensin system; SARS-CoV-2= severe acute respiratory syndrome coronavirus-2.

COVID-19 vaccine trials have included patients with heart disease and did not divulge any serious adverse effects from vaccination in this patient population [28,29]. Patients with chronic cardiovascular disease, including RHD, are at an increased risk of morbidity and mortality due to COVID-19 infection, and should still be encouraged to take available vaccines. It is important to notice that there is a significant number of people living with subclinical and undiagnosed RHD, who are unknowingly at a higher risk of a worse prognosis of COVID-19 infection. Furthermore, people experiencing new disease symptoms were less likely to seek medical care due to concerns regarding travel and attending clinics at hospitals or healthcare facilities in the fear of contracting COVID-19.

Cardiac assessment and outpatient clinic visits should be made easily available to enhance RHD diagnosis and the start of proper medical treatment to improve disease prognosis. Timely diagnosis of RHD is essential as secondary prevention, and the start of penicillin prophylaxis might prevent the progression and worsening of valve disease. Follow-up visits should be encouraged, and programs should be developed to keep track of patients, enhance patient awareness, compliance with medical treatment and secondary prophylaxis, prevent adverse events and the progression of disease [30,31].

Continuation and progress in RHD research [30-39], advocacy, and dedicated programs should regain their intensity and remain a focus of care. Awareness and interest in RHD should not decrease, and optimal care should be provided, with

improved institutional protocols to provide continuous follow-up and care of RHD patients, who are at higher risk of morbidity and mortality due to interruptions during the COVID-19 pandemic, as well as the concomitant increased risk caused by the viral infection and in whom the concomitant need for additional care in the form of anticoagulation, penicillin prophylaxis, and frequent clinic visits might prevent disastrous consequences.

Regaining control over medical appointments, compliance with medical treatment and prophylaxis, as well as the availability of prophylaxis and interventions is therefore essential. However, this might be a long-term struggle as inpatient and outpatient visit rates do not recover to pre-epidemic levels until after many years, and fear of contracting the infection by visiting healthcare facilities might not be a brief phenomenon [40]. Furthermore, the decreased interest and focus of patients caused by the disruptions and difficulties faced might have long-term consequences on patient behavior.

As pandemics can unfold quickly, it is necessary to have a 'playbook' for a swift response to any future interruptions in normal healthcare practices (Figure 3). With the current decrease in preventive measures for COVID-19 and the push to return to 'normal' life, renewed prioritization of RHD on the global agenda should be regained, and efforts to improve diagnosis, treatment, prevention, and care should be encouraged.

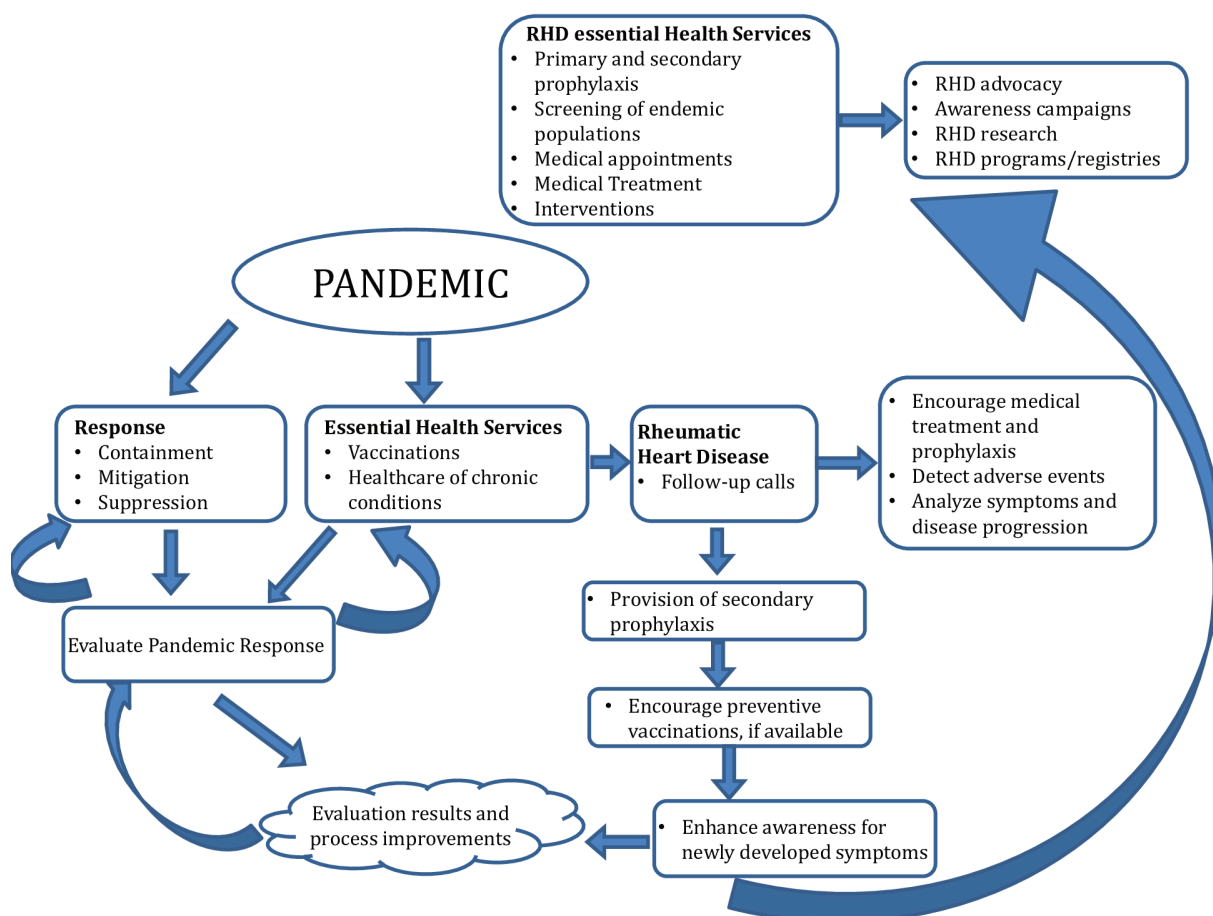


Figure 3. 'Playbook' for Rheumatic Heart Disease essential health care services during a pandemic.

Conclusions

The COVID-19 pandemic has had a significant impact on cardiovascular disease, particularly RHD, leading to poorer outcomes for those with severe heart valve disease. Timely diagnosis of RHD, secondary prevention, medical and surgical care is essential. Renewed prioritization of RHD on the global agenda, with dedicated programs, should be encouraged, and efforts to improve diagnosis, treatment, prevention, and care are warranted.

Disclosure statement

No potential conflict of interest was reported by the author.

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