



Patient Perceptions of Cardiac Electrophysiology Procedural Postponement at an Urban Center During the SARS-CoV-2 Pandemic

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Abstract

To curb transmission of SARS-CoV-2 and preserve hospital resources, elective procedures were postponed in the United States, affecting patients previously scheduled for electrophysiology (EP) procedures. We aimed to understand patients' perceptions related to procedural postponements during the first wave of the SARS-CoV-2 pandemic. We performed a telephone survey between May 1-15 2020, of consecutive patients who experienced procedural postponement from March-April. Of 112 patients, 20% may have been lost to follow up and 12% lost interest in having their procedures done. The level of anxiety related to postponement was moderate to high in more than two thirds of patients.

Keywords

cardiovascular Disease, COVID-19, communication, patient education, patient expectations

Introduction

The SARS-CoV-2 pandemic has created unprecedented challenges across medicine, especially in procedural subspecialties such as electrophysiology. As a result of “shelter in place” orders issued during the course of spring 2020,¹ elective procedures in hospitals across much of the United States were postponed. To help electrophysiologists triage pending procedures for postponement, the Heart Rhythm Society (HRS) released guidelines outlining the level of urgency of cardiac electrophysiology (EP) procedures.² As procedural wait times may affect patient satisfaction and retention, delays have also created challenges for health care providers, hospitals, and health systems. Given the unequal distribution of vaccines, mutations of the virus, and possible further pandemic waves, we aimed to understand patients' perceptions and anxiety level related to procedural and admission

postponements at an urban center in a city deeply affected by the SARS-CoV-2 pandemic.³ We hoped to gain insight

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Table 1. Baseline Patient Characteristics.

Patient Characteristics	Patients Participating in Survey, n=77 Value (%)	Patients Unable to be Reached by Phone, n=22 ^a Value (%)	p-value –
Age, mean ± SD	64.7±15.5	57.4±14.4	–
Race			
White	24 (32)	11 (50)	0.11
Non-white	52 (68)	11 (50)	
Religion		–	–
Not religious	10 (13)		
Baptist	20 (26)		
Catholic	26 (33)		
Jewish	2 (3)		
Jehovah's Witness	4 (5)		
Muslim	2 (3)		
Other	13 (17)		
Education		–	–
≤ High school	55 (71)		
> High school	22 (29)		
Income of Zip Code of Residence			0.49
Above poverty line	57 (71)	14 (64)	
Below poverty line	23 (29)	8 (36)	
Employment prior to SARS-CoV-2 pandemic		–	–
Employed	16 (21)		
Not employed	61 (79)		
Cardiac comorbidities			
Diabetes	35 (43)	7 (32)	0.25
Hyperlipidemia	52 (65)	8 (36)	0.008
Hypertension	67 (84)	20 (91)	0.62
Obesity	47 (59)	6 (27)	0.005
Cardiomyopathy	41 (51)	7 (32)	0.02
Coronary artery disease	28 (35)	4 (18)	0.11
Cerebrovascular Accident	12 (15)	4 (18)	0.77
Procedures Postponed			
Atrial fibrillation related			
Atrial fibrillation or atypical atrial flutter ablation	19 (25)	1 (5)	0.04
Cardioversion	7 (9)	2 (9)	0.22
Admission for dofetilide initiation	1 (1)	0 (0)	–
Heart failure related			
Primary prevention implantable cardioverter defibrillator ^b	12 (16)	4 (18)	0.77
Cardiac resynchronization therapy-defibrillator	8 (10)	0 (0)	–
Other ablations ^c	8 (10)	4 (18)	0.38
Other devices ^d	22 (29)	11 (50)	0.06

SD, standard deviation

^aSelf-reported patient characteristics were unable to be obtained for those patients not able to be reached by phone.

^bSubcutaneous and transvenous defibrillators.

^cSupraventricular tachycardia ablation, typical atrial flutter ablation, ventricular tachycardia ablation, premature ventricular complexes ablation.

^dCardiac implantable electronic device extraction (lead fracture), loop recorder implant and removal, left atrial appendage closure device implant, pacemaker generator change, implantable cardioverter defibrillation generator change, implantable cardioverter defibrillator lead revision.

in understanding our patients' experience in the event of another unforeseen health catastrophe.

Methods

We identified consecutive patients scheduled for various EP procedures and admissions from March 23rd - April 22nd 2020 who experienced procedural postponement immediately following our regional "shelter in place order" during the first wave of the SARS-CoV-2 pandemic.¹ The elective procedures

postponed during that time period followed the HRS prioritization guidelines to minimize peri-procedural SARS-CoV-2 exposure for both patients and providers.² Telephone interviews were performed by medical trainees between May 1st and May 15th 2020. Consent was obtained at the beginning of the telephone interview and mailed to participants for their review and signature. Patients were not incentivized to participate in the phone survey. The survey was an original instrument generated by co-authors (ASLR, BK, EC, AB, AV, MBB, JC, IRW). Socio-demographics and SARS-

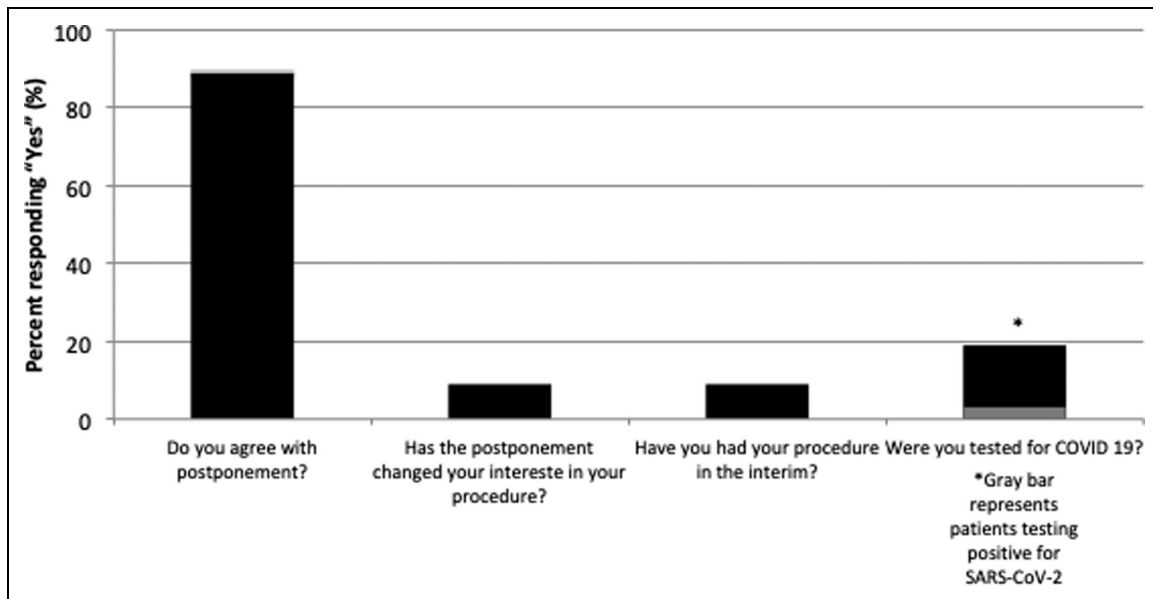


Figure 1. Patient Perceptions of Electrophysiology Procedural Postponement during the SARS-CoV-2 Pandemic.

CoV-2 testing history were obtained from patients during the telephone survey. Anxiety was measured by asking patient about their self-perceived level of anxiety on a point-based scale. Exact questions asked as part of the survey are included in the (Supplemental Appendix). Medical history and comorbidities were obtained from the electronic medical record. Patient income was estimated based on zip code from state records.⁴ This study was approved by our institutional review board.

Normally distributed continuous variables were compared using the Student's *t*-test. Unadjusted analyses of dichotomous variables were performed using Pearson's χ^2 test. Potential associations were determined a priori, namely patient sociodemographic variables and testing history versus response questions regarding perceptions of procedural postponement. *P*-values < 0.05 were considered significant. Analyses were performed using STATA 15.1 Statistical Software (StataCorp, College Station, Texas).

Results

Of the 112 patients postponed, 77 patients (68%) consented to the study. The remaining 35 patients could not be reached by phone despite ≥ 3 attempts ($n = 22$, 20%) or did not consent to the study ($n = 13$, 12%). Baseline characteristics of patients with procedural postponements can be found in Table 1. Atrial fibrillation (AF) was the most common indication for a procedure among those surveyed, followed by heart failure, which was related to 26% of postponed procedures.

Among those surveyed, almost half of patients (48%) blamed their procedural postponement on the "lack of safety in the hospital." The majority of patients self-reported moderate (32%) or high (38%) anxiety related to their procedural

postponement. There was no relationship between procedure type (ablation vs. device vs. other) and level of anxiety ($p = 0.16$). In response to when patients thought their procedure would occur, 35% believed it would occur within 12 weeks of the survey, 17% believed it would occur in more than 12 weeks, and 45% were unsure, while 3% stated their procedure would likely never occur.

Few patients (11%) disagreed with the postponement (Figure 1), and there was no relationship between disagreement with postponement and race ($p = 0.77$), living in poverty ($p = 0.31$), level of education ($p = 0.28$), employment status ($p = 0.54$), EP diagnosis ($p = 0.63$), or type of procedure ($p = 0.3$). A similar proportion of patients (12%, $n = 9$) reported a change in interest in having their procedure done. However, all the patients who had a change in interest in moving forward with their procedure nonetheless agreed with the postponement. Of patients reconsidering their procedure during the course of the postponement, 22% had AF, all awaiting AF ablation, and 44% had heart failure, all awaiting primary prevention implantable cardioverter-defibrillator (ICD) or cardiac resynchronization therapy defibrillator (CRT-D) implant. The remaining 3 patients reconsidering their procedures were scheduled for loop recorder implant ($n = 1$) and typical atrial flutter ablation ($n = 2$). There was no relationship between reconsidering a procedure and race ($p = 0.92$), level of education ($p = 0.28$), EP diagnosis ($p = 0.55$), or type of procedure ($p = 0.8$). However, all patients with a change in interest in having their procedures done lived in an area with median income above the poverty line ($p = 0.04$).

Patients who had undergone SARS-CoV-2 testing (19%, $n = 15$) were more likely to disagree with postponement than those who had not undergone testing (81%, $n = 62$)

(30% of those tested disagreed vs. 2% of those not tested, $p < 0.001$). Notably, only 2 patients tested positive for SARS-CoV-2 (Figure 1) and both patients wanted to move forward with having their procedures done.

Discussion

The postponement of elective procedures due to SARS-CoV-2 poses multifaceted challenges for patients, hospitals, and health systems. Given the unequal distribution of vaccines and the mutation of the virus, there remains a potential future need to postpone EP procedures. Therefore, we aimed to understand how EP patients receiving care at an urban center markedly affected by the first wave of the SARS-CoV-2 pandemic perceived these delays and how it may affect patient retention. Nearly half of patients identified the perceived risk of exposure to SARS-CoV-2 in the hospital as the reason for procedural postponement. Although retention was high at our own institution, 12% of patients surveyed still lost interest in rescheduling their procedures after the pandemic, and 20% were not easily reachable and may have been lost to follow-up. This was independent of socio-demographic characteristics such as ethnicity, income or education level, as well as the specific procedure planned. As nearly half of patients were uncertain as to when their procedure would occur and most reported anxiety regarding procedural postponement, these may be important areas of focus regarding patient expectations, education, and communication during such a prolonged delay or potential future postponements.

Our specific study population is representative of many urban communities, with a high proportion of racial and ethnic minorities, prevalent poverty, and a broad range of levels of education.⁵ Urban centers and minorities have been disproportionately affected by SARS-CoV-2,⁶⁻⁸ and similarly, historically are disproportionately affected by cardiovascular risk factors and disease.^{9,10} In Pennsylvania, Philadelphia County had the highest number of SARS-CoV-2 cases per 100,000 during the first pandemic wave and within the county, there was wide hospital and health system variation in regards to number of cases.³ The perceptions of urban patients and the perceived impact of delays in their healthcare as a result of SARS-CoV-2 is particularly relevant, as they are the patients most likely to be affected by SARS-CoV-2 infection and have a severe course if infected.^{11,12}

The level of anxiety related to postponement was moderate to high in more than two thirds of patients, and while one third of patients surveyed were confident their procedure would occur within 12 weeks of the survey, nearly half were uncertain as to when their procedures would occur. This is important as proceduralists should anticipate and gauge patients' expectations with regards to rescheduling procedures delayed for several weeks.

A potential hurdle in rescheduling postponed patients or even patients now scheduled during the ongoing pandemic

may be the perception that exposure to SARS-CoV-2 in the hospital may occur. In fact, nearly half of our patients cited this as the reason for their procedural postponement, and nearly all patients agreed with postponement. Nonetheless, 12% of patients lost their interest in having their procedure done, perhaps now questioning the necessity of the procedure given that it could be postponed, or questioning the safety of the hospital. In scheduling patients for procedures during the pandemic, having safety measures in place, and communicating these measures to patients may be an important assurance.

Although we serve a diverse and at-risk population, socio-demographic characteristics within our population had no association with reconsidering their procedures, nor did the type of procedure postponed. The SARS-CoV-2 pandemic has hit large cities and minorities hardest, where social determinants of health often shape outcomes, interactions between clinicians and minority patients have been reported to be of lower quality, and interruptions in health care have been perceived to be related to racial bias, resulting in lack of trust in the health care system.^{13,14} While no association was found with measured patient characteristics and skepticism regarding rescheduling of their elective procedures, possible unmeasured health literacy factors or patient characteristics may play an important role.

Finally, few of our patients were tested for SARS-CoV-2 and only 2 patients tested positive, but testing overall was associated with disagreement with postponement. As a majority of patients tested negative in our study population, they may have felt more at ease going through with their procedures having had the reassurance of a negative test for SARS-CoV-2, and thus may have felt impatient with postponement.

Limitations

The study's cross-sectional design allowed for only measures of prevalence and association, and not causation. The socio-demographic diversity of the study population may limit generalizability to more homogenous communities. Income level of each patient was based on publicly reported medians by zip code, and was not self-reported. Anxiety was self-reported and there was no validated instrument used to measure anxiety. Therefore, our findings cannot be interpreted as a diagnostic assessment of anxiety. Finally, any potential detriment to patient's health related to procedural postponement was beyond the scope of the study.

Declaration of Conflicting Interests

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Supplemental Material

Supplemental material for this article is available online

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