

Cardiological teleconsultation in the coronavirus disease 2019 era: patient's and physician's perspective

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Introduction In response to the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, the Polish National Health Fund (Polish, Narodowy Fundusz Zdrowia) enabled teleconsultations to be performed on a national scale, through new legislation and reimbursement rules. Although Piotrowicz et al¹ recommended the more common use of telemedicine solutions among cardiac patients in everyday practice in 2018, its implementation remained largely unsatisfactory and limited to small subgroups in Poland. However, due to the recent SARS-CoV-2 pandemic, the Polish government needed to provide the community with continuous care, while adhering to social distancing rules. Telehealth appears to be a perfect solution for this purpose, as it allows medical practitioners to consult with patients regarding symptoms, prescribe medications, provide referrals for further examination, or issue medical certificates for sick leave, without the risk of SARS-CoV-2 transmission.

The aim of this study was to assess how teleconsultations are received by physicians and patients. In addition, we assessed whether all medical issues can be addressed during a teleconsultation, and the type of consultation patients would be willing to have in the future.

Methods From March 2020 in Poland, all consultations that did not require direct contact or specialized examination were required to be changed to teleconsultations. After obtaining consent from the patient, the physician scheduled teleconsultation time and called the patient.

The calls were performed by 5 cardiologists and 3 cardiology residents. Our study group comprised 100 consecutive patients from various units (including invasive cardiology, electrophysiology, cardiac implantable electronic device, preventive and general cardiology) at the 1st Department of Cardiology, University Hospital of the Medical University of Warsaw (Poland). Every patient provided informed consent to participate in the study. Each patient who had an outpatient visit scheduled was contacted and informed about the possibility of teleconsultation. After obtaining consent (all patients agreed), a physician made a phone call at the scheduled time and performed teleconsultation. All of the patients were known to the clinic, part of them had previously procedures and tests performed with accordance to treatment or diagnostic schemes. After the teleconsultation, both the physician and patient were interviewed by an independent consultant. Physicians were asked about their attitude to telemedicine, any technical difficulties, and the efficiency of communication with the patient. Patients were also asked about their acceptance of the teleconsultation, whether all medical issues were addressed, and the type of consultation they would prefer next time. Acceptance evaluation was assessed based on a scale from 1 to 10, where 1 point meant no acceptance and 10, full acceptance.

This was an observational, noninvasive, and nonrandomized study that, according to the bioethics committee, did not require any approval other than notification. Still, every patient

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Received: October 14, 2020.
Revision accepted:
December 20, 2020.
Published online: January 4, 2021.
Kardiologia Pol. 2021; 79 (1): 76-78
doi:10.33963/KP.15737
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TABLE 1 Factors affecting acceptance of teleconsultations

Variable		Acceptance evaluation	P value
Patient sex	Male	8 (8–10)	0.35
	Female	8 (5–10)	
Patient age, y	≥65	8 (7–10)	0.69
	<65	8 (7–10)	
Patient comorbidity ^a	Yes	9 (7–10)	0.29
	No	8 (6–9)	
All medical issues addressed: patients' perspective	Yes	9 (8–10)	<0.001
	No	7 (5–8)	
All medical issues addressed: physicians' perspective	Yes	10 (8–10)	0.91
	No	10 (8–10)	

Data are presented as the median and interquartile range.

a Comorbidity defined as one or more diagnosed cardiovascular diseases

signed an informed consent form on admission to the clinic for personal and medical data administration and analysis, and verbally agreed to participate in this project.

Statistical analysis Distributions of continuous variables were nonnormal based on the Shapiro–Wilk test. Continuous variables were presented as medians and interquartile ranges (IQR) and categorical variables as number and percentage of patients. Correlations between continuous variables were calculated with the Spearman correlation tests. Differences between groups were assessed with the Mann–Whitney U test for continuous variables. A *P* value of less than 0.05 was considered statistically significant. Statistical analysis was calculated using the SAS software, version 9.4 (SAS Institute, Cary, North Carolina, United States, Cary, North Carolina, United States).

Results and discussion Over a 2.5-month period (from March 24, 2020 to June 10, 2020), 100 teleconsultations were performed and included in the analysis. The time from visit to visit was identical with the pre-pandemic period, as teleconsultations took place instead of regular visits. The median (IQR) age of consulted patients was 68 (60–78) years, and the majority were male (70 [70%]). All participants had at least a single cardiovascular comorbidity, and 90 patients (90%) had at least 2. Chronic coronary syndrome was present in 62 (62%), heart failure in 37 (37%), hypertension in 66 (66%), and atrial fibrillation / flutter in 34 patients (34%).

According to physicians, in 99 consultations (99%), communication with the patient was efficient. It was deemed unsatisfactory in only in a single case due to the patient's hearing

impairment. The median (IQR) acceptance rate with the teleconsultation was 8 (7–10) among patients, and 10 (8–10) for physicians ($r = -0.03$, $P = 0.81$). Over half of the patients (47 [57%]) would prefer to have a teleconsultation rather than a traditional visit next time. The vast majority of patients (85%) stated all medical issues were addressed. Pharmacological treatment changes and treatment prolongation was advised in 25% and 71% of the studied population, respectively. All of those patients received an electronic prescription.

The determinants of patient acceptance are shown in TABLE 1. Addressing all medical issues during teleconsultation improved patient acceptance ($P < 0.001$). The correlation between patient acceptance and age was statistically insignificant. However, there was a trend towards higher acceptance with older age ($r = 0.04$, $P = 0.07$).

Only 2 patients (2%) required subsequent traditional contact with a healthcare representative. In a single case, a traditional consult was needed due to the patient's poor hearing. In the second case, the patient was suspected of having a tachycardia episode based on the reported symptoms and was referred for an urgent emergency department visit.

Due to the high contagiousness of SARS-CoV-2,² social distancing has been advised, including restricted access to face-to-face visits. Indeed, the Heart Rhythm Society has recommended more common use of telemedicine for care maintenance, considering the circumstances surrounding this pandemic.³ Based on data from national registries, Polish cardiologists have reported that teleconsultations became the standard of care in Poland during lockdown.^{4,5} However, to the best of our knowledge, this is the first study to prospectively evaluate cardiac patients' perspective on

teleconsultations during the coronavirus disease 2019 pandemic in Poland.

Despite the recent rapid improvement in telemedicine methods, its implementation into clinical practice remains challenging. Although many mobile applications for education and treatment process management support are currently available on the market, their efficacy has not yet been tested in large, prospective trials.⁶ Some large studies have provided promising results in terms of detecting atrial fibrillation with wearable devices^{7,8}; however, overall, research in this area is somewhat limited.

In the pre-pandemic period, physicians' satisfaction with teleconsultations was only moderate, as they partially regarded it as a time burden that was not reflected in their workload.⁹ Meanwhile, in the current study, acceptance of teleconsultations was not only high among physicians, but also, crucially, among patients. Moreover, most patients in this study would prefer teleconsultation over face-to-face visits in the future, which is consistent with results from other studies analyzing ambulatory patients' preference for teleconsultations.¹⁰ In another study, teleconsultations were indicated as the most convenient form of receiving rheumatology advice by 82% of respondents.¹¹

Some physicians raised questions related to limitations in terms of physical examination. This obstacle can be partially overcome with novel devices and artificial intelligence, such as mobile stethoscopes (StethoMe), mobile spirometers (AioCare), or mobile ECGs (Kardia).¹² Other limitations include technical inabilities, lack of devices for video-consultations, and deafness. Nevertheless, most patients who managed to address all medical issues during teleconsultations seem to stay in everyday practice for a longer period of time.

Despite undeniable benefits regarding limiting the spread of SARS-CoV-2 and the possibility of continuing treatment, one should be aware that long-term consequences of continuous care with teleconsultations are unknown. Future studies comparing in-clinic visits with teleconsultations would dispel the doubts regarding patient's prognosis.

In summary, the coronavirus disease 2019 pandemic can be regarded as a catalyst that facilitated the rapid adoption of telemedical solutions—a direction that was postulated for a long time before SARS-CoV-2 spread.

ARTICLE INFORMATION

ACKNOWLEDGMENTS We thank all the participants for their involvement in the study. We thank Proper Medical Writing, Warsaw, Poland, for editorial support.

CONFLICT OF INTEREST None declared.

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HOW TO CITE Kołtowski Ł, Krzowski B, Boszko M, et al. Cardiological teleconsultation in the coronavirus disease 2019 era: patient's and physician's perspective. *Kardiol Pol.* 2021; 79: 76-78. doi:10.33963/KP.15737

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