

available at www.sciencedirect.com
journal homepage: www.europeanurology.com



European Association of Urology



Brief Correspondence

Telemedicine Online Visits in Urology During the COVID-19 Pandemic—Potential, Risk Factors, and Patients' Perspective

Katharina Boehm^{*}, Stefani Ziewers, Maximilian P. Brandt, Peter Sparwasser, Maximilian Haack, Franziska Willems, Anita Thomas, Robert Dotzauer, Thomas Höfner, Igor Tsaar, Axel Haferkamp, Hendrik Borgmann

Department of Urology, University Medical Center, Johannes Gutenberg University, Mainz, Germany

Article info

Article history:

Accepted April 21, 2020

Associate Editor:

James Catto

Keywords:

Telehealth
E-health
Coronavirus
Severe acute respiratory syndrome coronavirus 2
2019 novel coronavirus
Outpatients

Abstract

The current coronavirus disease 2019 (COVID-19) pandemic has placed considerable strain on hospital resources. We explored whether telemedicine (defined as a video-conference) might help. We undertook prospective structured phone interviews of urological patients ($n=399$). We evaluated their suitability for telemedicine (judged by a panel of four physicians) and their risks from COVID-19 (10 factors for a poor outcome), and collected willingness for telemedicine and demographic data. Risk factors for an adverse outcome from COVID-19 infection were common (94.5% had one or more) and most patients (63.2%) were judged suitable for telemedicine. When asked, 84.7% of patients wished for a telemedical rather than a face-to-face consultation. Those favouring telemedicine were younger (68 [58–75] vs 76 [70–79.2] yr, $p < 0.001$). There was no difference in preference with oncological (mean 86%) or benign diagnoses (mean 85%), or with COVID-19 risks factors. In subgroup analysis, men with prostate cancer preferred telemedicine (odds ratio: 2.93 [1.07–8.03], $p = 0.037$). We concluded that many urological patients have risk factors for a poor outcome from COVID-19 and most preferred telemedicine consultations at this time. This appears to be a solution to offer contact-free continuity of care.

Patient summary: Risk factors for a severe course of coronavirus disease 2019 are common (94.5%) in urology patients. Most patients wished for a telemedical consultation (84.7%). This appears to be a solution to offer contact-free continuity of care.

© 2020 Published by Elsevier B.V. on behalf of European Association of Urology.

* Corresponding author. Tel.: +49 6131 17 2481; Fax: +49 6131 17 7081.
E-mail address: katharina.boehm@unimedizin-mainz.de (K. Boehm).

The main goals for urologists during the coronavirus disease 2019 (COVID-19) pandemic are to prevent their patients from getting COVID-19, protect themselves as health care professionals, and deliver optimal urology care [1]. While prioritisation strategies are being proposed [2,3], further measures are warranted for multifaceted action plans towards optimal perpetuation of urology care during the pandemic [4].

Urological telemedicine can lead to (1) fewer patient contacts, (2) lower infection rates among the staff, and (3)

continuation of urological care by quarantined urologists [5]. However, the proportion of patients eligible for telemedicine, their wish to use telemedicine, and their demographic risk profile for acquiring a severe pandemic infection are unknown.

In this context, we tested the potential of telemedicine in urology. We evaluated patients' eligibility for telemedicine according to the physician and examined the patients' perspective by evaluating their willingness for telemedicine.

<https://doi.org/10.1016/j.eururo.2020.04.055>

0302-2838/© 2020 Published by Elsevier B.V. on behalf of European Association of Urology.

COVID-19 risk factors and diagnosis

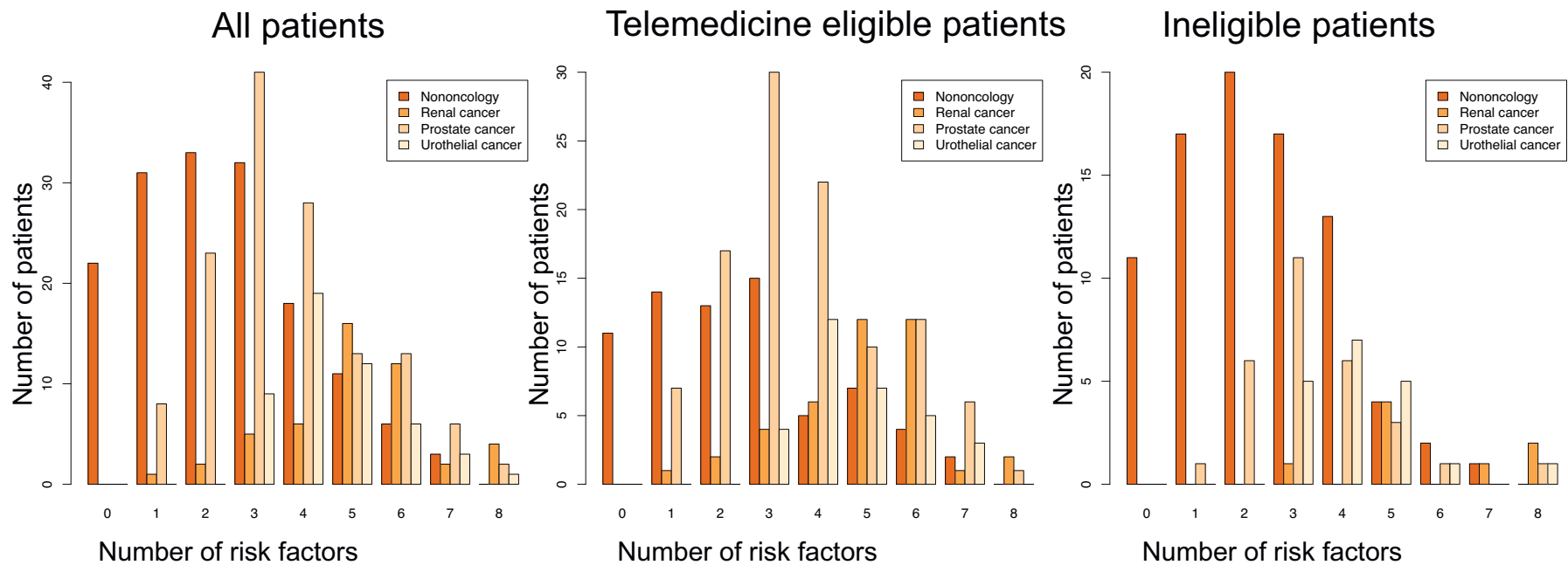


Fig. 1 – Patients numbers stratified according to diagnosis, number of risk factors, and eligibility for telemedicine. The number of risk factors was calculated as a sum of age ≥ 50 yr, circulatory disease, diabetes, respiratory disease, liver disease, renal disease, history of oncological disease, immunosuppression at the time of the interview, nicotine abuse (actual abuse), and hypertension. Patients were classified as telemedicine eligible if the primary reason for their consultation can be solved completely by telemedicine. By contrast, if in-person/on-site services such as physical examination, current laboratory values, ultrasound, or other procedures were needed, patients were classified as telemedicine ineligible. COVID-19=coronavirus disease 2019.

Furthermore, we assessed the risk profile of urological patients for a poor outcome of COVID-19.

We analysed 399 consecutive outpatients with scheduled appointments at our tertiary centre between October 2019 and February 2020. The institutional review board approved the study. All participants gave oral informed consent.

Prospective structured phone interviews were conducted between 18 and 24 March 2020. Information about age, reason for consultation, and medical history were collected. Information about 10 risk factors for a poor outcome of COVID-19 according to the Robert-Koch Institute (RKI) for disease surveillance and prevention was gathered. The patients' perspective was evaluated by asking the following question: "If your appointment was tomorrow during COVID-19 pandemic, would you prefer in-house appointments or telemedicine contact?"

Telemedicine was defined as videoconference. Eligibility for telemedicine was evaluated by four experienced physicians according to the patients' files at the time of consultation. Patients were classified as telemedicine eligible if their primary reason for consultation could be solved completely by telemedicine. On the contrary, if physical examination, current laboratory values, ultrasound, or other procedures were needed, patients were considered telemedicine ineligible. Statistics were per-

formed using RStudio v0.98.953 (R Project for Statistical Computing, www.R-project.org).

The CONSORT diagram depicts the study design (Supplementary Fig. S1). The reason for consultation was mostly an oncological disease (243/399 patients, 60.9%). Most patients were older than 50 yr (346, 86.7%). Self-reported comorbidities consisted of cardiovascular disease (42.4%), diabetes (13.8%), pulmonary disease (16%), liver dysfunction (12%), renal dysfunction (34.1%), oncological disease (60.9%), and hypertension (56.1%). Immunosuppression was reported by 7.5% and a positive current smoking status in 11.6% (Supplementary Table S1).

A total of 338 patients (84.7%) wished for a telemedical consultation in case of pandemic. The reason for refusal of telemedical contact was mostly technical limitations (17.3%); 2.5% prefer personal contact with their physician.

A total of 252 patients (63.2%) were eligible for telemedicine according to the physician. Patients eligible for telemedicine were younger (69 vs 73 yr; $p = 0.02$) but had a higher number of risk factors for a severe course of COVID-19 (4 vs 3 [interquartile range 2–4 vs 2–5]; $p \leq 0.001$). Eligibility for telemedicine was more prevalent in oncological patients than in nononcological patients (181 [74.4%] vs 71 [45.5%]; $p < 0.001$; Supplementary Fig. S1).

Patients with renal cancer had the highest number of risk factors (median 5 [4–6], followed by patients with

Table 1 – Characteristics of patients eligible for telemedicine ($n = 252$) stratified according to their wish for telemedical consultation (positive vs negative).

Patient perspective for telemedical consultation	Overall	Positive	Negative	<i>p</i> Value
<i>n</i> (%)	252 (100)	216 (85.7)	36 (14.3)	
Age (yr), median (IQR)	69 (60–76)	68 (58–75)	76 (70–79.2)	<0.001
Patients' reason for denial of telemedicine, <i>n</i> (%)				<0.001
NA	201 (100)	199 (99)	2 (1)	
Other	3 (100)	1 (33.3)	2 (66.7)	
Personal contact	6 (100)	0 (0)	6 (100)	
Technical limitation	42 (100)	16 (38.1)	26 (61.9)	
Reason for consultation, <i>n</i> (%)				0.9
Oncological	181 (100)	156 (86.2)	25 (13.8)	
Nononcological	71 (100)	60 (84.5)	11 (15.5)	0.04
Andrology	14 (100)	12 (85.7)	2 (14.3)	
BPS	10 (100)	8 (80)	2 (20)	
Testicular cancer	2 (100)	1 (50)	1 (50)	
Incontinence/bladder dysfunction	13 (100)	8 (61.5)	5 (38.5)	
Renal cancer	40 (100)	37 (92.5)	3 (7.5)	
Other	14 (100)	13 (92.9)	1 (7.1)	
Reconstructive urology	8 (100)	7 (87.5)	1 (12.5)	
Penile cancer	3 (100)	2 (66.7)	1 (33.3)	
Prostate cancer	105 (100)	94 (89.5)	11 (10.5)	
Urothelial cancer	31 (100)	22 (71)	9 (29)	
Urolithiasis	5 (100)	5 (100)	0 (0)	
Urinary tract infection	7 (100)	7 (100)	0 (0)	
No. of risk factors for severe COVID-19 infection, median (IQR)	4 (2–5)	4 (2–5)	3.5 (3–5)	0.9
No. of risk factors for patients, <i>n</i> (%)				0.9
≤ 3	120 (100)	102 (85)	18 (15)	
> 3	132 (100)	114 (86.4)	18 (13.6)	

BPS = bladder pain syndrome; COVID-19 = coronavirus disease 2019; IQR = interquartile range; NA = not available.

Patients were classified as telemedicine eligible if their primary reason for consultation could be solved completely by telemedicine. By contrast, if in-person/on-site services such as physical examination, current laboratory values, ultrasound, or others were needed, patients were classified as telemedicine ineligible.

urothelial cancer (4 [4,3–5]), prostate cancer (3 [3–4.8]) and nononcological disease (2 [2,3–5]; Fig. 1).

In total, 216 (54.1%) patients were eligible for telemedicine and wished for a telemedical consultation. Characteristics of patients eligible for telemedicine and with a wish for a telemedical consultation versus those who do not wish for a telemedical consultation were comparable, except that the latter were significantly older (76 vs 68 yr, $p < 0.001$; Table 1).

The RKI recently stated the risk factors for a severe outcome of COVID-19 [6]. These high-risk patients should protect themselves by avoiding social contact, particularly high-risk environments such as medical institutions. On the contrary, perpetuation of conditions requiring urgent treatment, such as cancer, is of utmost importance. Telemedical consultation could help solve the discrepancy between staying at home and getting professional medical advice.

Our findings show that a large proportion (54.1%) of our patients are eligible and willing to keep a telemedical appointment if they were scheduled during the COVID-19 pandemic. In addition, we found a positive association between a higher risk profile (odds ratio 1.71) and eligibility for telemedicine. On the contrary, no association was found between the number of risk factors and patients' wish for a telemedical consultation ($p = 0.1$). It might be possible that these patients do not reflect their own risk status or these older patients are not able to provide the technical requirements.

To the best of our knowledge, no data about COVID-19 risk factor distribution and urological diagnoses exist. Our findings show that patients with urological malignancies have a higher number of risk factors for a severe COVID-19 course than patients with nononcological disease (2 vs 4, $p < 0.001$; data not shown). Oncological patients are older than nononcological patients (71 vs 65 yr, $p < 0.001$; data not shown), and immunosuppression is more commonly used in cancer patients (3.2% vs 10.3%, $p = 0.02$; data not shown). Larson et al [7] showed that telemedical intervention in cancer patients is comparable with face-to-face interaction regarding quality of life. No data exist about oncological outcome in patients who received telemedical advice.

Our study is not without limitations. First, risk factors for a severe outcome of COVID-19 are not validated. Most risk factor analyses for an unfavourable outcome of COVID-19 are conducted in in-patient populations [8,9]. A large Chinese study found in 1590 nationwide hospitalised cases that patients with diabetes, chronic obstructive pulmonary disease, hypertension, or malignancy are at higher risk for death, intensive care unit treatment, or receiving invasive ventilation [10]. Our risk factors are in line with these results.

Taken together, our study adds some important information about patients' perspective on telemedical consultation during COVID-19 pandemic. We found that overall 54.1% of our patients were both eligible and willing to be scheduled for telemedical appointments. In addition, we evaluated the number of risk factors for an unfavourable outcome of COVID-19 and urological condition, and found

that patients with more risk factors and urological malignancies are significantly more often eligible for telemedicine.

Author contributions: Katharina Boehm had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study concept and design: Boehm, Borgmann, Haferkamp.

Acquisition of data: Ziewers, Brandt, Sparwasser, Haack, Willems, Thomas, Dotzauer, Höfner, Tsaur.

Analysis and interpretation of data: Boehm, Borgmann.

Drafting of the manuscript: Boehm, Borgmann, Brandt.

Critical revision of the manuscript for important intellectual content: Ziewers, Brandt, Sparwasser, Haack, Willems, Thomas, Dotzauer, Höfner, Tsaur, Haferkamp.

Statistical analysis: Boehm.

Obtaining funding: None.

Administrative, technical, or material support: None.

Supervision: Boehm, Borgmann, Haferkamp.

Other: Telephone interviews were conducted by Willems.

Financial disclosures: Katharina Boehm certifies that all conflicts of interest, including specific financial interests and relationships and affiliations relevant to the subject matter or materials discussed in the manuscript (eg, employment/affiliation, grants or funding, consultancies, honoraria, stock ownership or options, expert testimony, royalties, or patents filed, received, or pending), are the following: None.

Funding/Support and role of the sponsor: None.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.eururo.2020.04.055>.

References

- [1] Chan MC, Yeo SEK, Chong YL, Lee YM. Stepping forward: urologists' efforts during the COVID-19 outbreak in Singapore. *Eur Urol* 2020. <https://doi.org/10.1016/j.eururo.2020.03.004>
- [2] Stensland KD, Morgan TM, Moinzadeh A, et al. Considerations in the triage of urologic surgeries during the COVID-19 pandemic. *Eur Urol* 2020. <https://doi.org/10.1016/j.eururo.2020.03.027>
- [3] Gillessen SP, Powles T. Advice for Medical Oncology care of Urological cancer patients during the COVID-19 pandemic. *Eur Urol* 2020. <http://dx.doi.org/10.1016/j.eururo.2020.03.026>, April 17th.
- [4] Ficarra V, Novara G, Abrate A, et al. Urology practice during COVID-19 pandemic. *Minerva Urol Nefrol* 2020. <https://doi.org/10.23736/S0393-2249.20.03846-1>
- [5] Miller A, Rhee E, Gettman M, Spitz A. The current state of telemedicine in urology. *Med Clin North Am* 2018;102:387–98.
- [6] Robert Koch Institute SARS-CoV-2 Steckbrief zur Coronavirus-Krankheit-2019 (COVID-19). RKI; 2020. https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Steckbrief.html
- [7] Larson JL, Rosen AB, Wilson FA. The effect of telehealth interventions on quality of life of cancer patients: a systematic review and meta-analysis. *Telemed J E Health* 2018;24:397–405.
- [8] Lai CC, Liu YH, Wang CY, et al. Asymptomatic carrier state, acute respiratory disease, and pneumonia due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): facts and myths. *J Microbiol Immunol Infect* 2020. <https://doi.org/10.1016/j.jmii.2020.02.012>

- [9] Rodriguez-Morales AJ, Cardona-Ospina JA, Gutierrez-Ocampo E, et al. Clinical, laboratory and imaging features of COVID-19: a systematic review and meta-analysis. *Travel Med Infect Dis* 2020. <https://doi.org/10.1016/j.tmaid.2020.101623>
- [10] Guan WJ, Liang WH, Zhao Y, et al. Comorbidity and its impact on 1590 patients with Covid-19 in China: a nationwide analysis. *Eur Respir J* 2020. <https://doi.org/10.1183/13993003.00547-2020>