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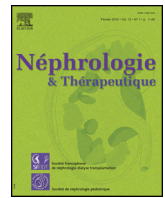


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Original article

Impact of Covid-19 on kidney transplant and waiting list patients: Lessons from the first wave of the pandemic



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ABSTRACT

Background. – The first wave of the Covid-19 pandemic resulted in a drastic reduction in kidney transplantation and a profound change in transplant care in France. It is critical for kidney transplant centers to understand the behaviors, concerns and wishes of transplant recipients and waiting list candidates.

Methods. – French kidney patients were contacted to answer an online electronic survey at the end of the lockdown.

Results. – At the end of the first wave of the pandemic in France (11 May 2020), 2112 kidney transplant recipients and 487 candidates answered the survey. More candidates than recipients left their home during the lockdown, mainly for health care (80.1% vs. 69.4%; $P < 0.001$). More candidates than recipients reported being exposed to Covid-19 patients (2.7% vs. 1.2%; $P = 0.006$). Many recipients and even more candidates felt inadequately informed by their transplant center during the pandemic (19.6% vs. 54%; $P < 0.001$). Among candidates, 71.1% preferred to undergo transplant as soon as possible, 19.5% preferred to wait until Covid-19 had left their community, and 9.4% were not sure what to do.

Conclusions. – During the Covid-19 pandemic in France, the majority of candidates wished to receive a transplant as soon as possible without waiting until Covid-19 had left their community. Communication between kidney transplant centers and patients must be improved to better understand and serve patients' needs.

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1. Introduction

In 2020, a novel coronavirus, designated SARS-CoV-2, caused an international outbreak of a viral illness predominantly affecting the respiratory system, termed Covid-19. In France, to limit the spread of the virus and control the first wave of this pandemic, a nationwide lockdown was implemented from March 17 2020 until May 11 2020. At that time, it had been reported that, amongst a total of 43327 kidney transplant recipients, and 17112 candidates for kidney transplantation, 532 (1.2%) recipients and 112 (0.7%) candidates had been diagnosed with a confirmed Covid-19 infection (11 May 2020, <https://www.agence-biomedecine.fr>).

Given the high rate of morbidity and mortality observed in transplanted patients [1–5] and to avoid saturation of intensive care units with recent transplant recipients [6], the Covid-19 pandemic has resulted in a drastic reduction in transplant activities in the United States and France [7,8]. In France, kidney transplantation was even suspended during the lockdown. In the UK, it has been estimated that during a 3-month period of Covid-19-related restrictions, up to 722 kidney transplantations were not performed [9].

Not only has access to transplantation been limited, but in order to shield patients from exposure in healthcare environments, clinics have transitioned to videoconference and telephone delivery of pre- and post-transplant care [10,11]. Further, many transplant societies (including the Francophone Society of Transplantation on the 11 March 2020) recommended not leaving home, favoring teleworking, physical distancing, and the systematic use of mask and hand sanitizers. However, despite these practice changes and published guidelines, it is unclear what was the perception of the transplant recipients or candidates regarding this information and whether or not they had the necessary tools to comply with precautions for avoiding Covid-19.

During the first wave of the pandemic, transplant centers have been tasked to make decisions on patients' behalf regarding the safety of kidney transplantation. This decision incorporates health systems considerations, including forecasts of hospital bed availability, as well as risks of Covid-19 infection and mortality in individuals on immunosuppressive therapy. Importantly, the patient's perspectives are often conspicuously absent from these decisions, including whether transplantation remains a priority for them. Despite an explosion of publications on the novel coronavirus, the patient's voice has been scarce [12,13].

In the present study we used a short survey to elicit and understand the behaviors, concerns, and priorities of kidney transplant recipients and waiting list candidates at the end of the first wave of the pandemic in France.

2. Patients and methods

2.1. Study design

The COWAIT study (Evaluating the impact of COvid-19 on WAlting list and Transplant patients), launched on the initiative of The Francophone Society of Transplantation (SFT), was approved by the French Institutional Review Board CPP 1283 HPS3 and registered on ClinicalTrials (Identifier: NCT04376775). Briefly, at the end of the lock-down, from 11 May 2020 to 23 May 2020, French kidney candidates and recipients were contacted directly by the French patient association France Rein (www.francerein.org) or by transplant centers to answer an electronic survey.

2.2. Study Population

French adult patients registered and awaiting a kidney transplant or those transplanted with a functional kidney were approached to participate in this study.

2.3. Survey

The questionnaire was adapted from the original initially developed by members of the Duke University Group for Abdominal Transplant Outcomes Research (GATOR), which comprises nephrologists, transplant surgeons, hepatologists and researchers (Annexe 1). It was obtained by iterative consensus over a series of meetings. A pilot test was performed with a few patients. The 38-question survey was translated in French. Three questions were removed: two about race and origin in accordance with French law and one about primary health insurance provider since there is a single French primary health insurance. The survey was placed on a secured platform accessible via a web link, the latter of which was emailed directly to patients. This anonymous survey did not solicit any patient identifying information and answers were not linked to the patient's medical records. In light of this means of distribution, patterns of non-response were not quantifiable.

2.4. Definition of the viral risk zone in France

In France, regions which had both a high prevalence of Covid-19 (more than 10% of emergency service admission for a suspicion of Covid-19) and/or a saturation of intensive care units (more than 80% of the intensive care beds occupied by Covid-19 patients) were classified as a high viral risk zone. The others were defined as low viral risk zones.

2.5. Statistical analyses

Categorical data are presented as counts and percentages and compared with a chi-square test. The Bonferroni post-hoc correction was applied for multilevel categorical variables. Continuous variables are expressed as means and standard deviations upon verification of their normal distribution with the Shapiro–Wilk test, and compared with a *t*-test. All analyses were conducted in the R environment (R Foundation for Statistical Computing, Vienna, Austria), and two-tailed *P* values < 0.05 were considered statistically significant.

3. Results

3.1. Patients description

In France between May 11 2020 and May 23 2020, among the 43327 kidney transplant recipients and the 17112 waiting list candidates, 2112 recipients (4.9%) and 487 candidates (2.8%) answered the survey. The majority of respondents lived in a low-risk viral zone (*n* = 1589; 61.1%), however over a third of respondents were living in a high-risk viral zone (*n* = 1010; 38.9%) (Fig. 1A). The mean ages of the recipients and candidates were 55.1 and 56.5 years-old, respectively (Table 1). The majority were male and were married or living as married. Most had internet and TV at home.

3.2. Precautions for avoiding Covid-19

69.4% of recipients and 80.1% of candidates left their home during the lockdown (*P* < 0.001), and among them, 48.2% and 76.9% did so more than once a week, respectively (*P* < 0.001) (Table 2). No differences were observed between the high and low risk zones (data not shown). The main reasons for leaving the home were for health care (recipients: 59.2% vs. candidates: 76.2%; *P* < 0.001), to buy groceries (recipients: 48.5% vs. candidates: 54%; *P* = 0.03), and to exercise (recipients: 26% vs. candidates: 21.1%; *P* = 0.03). Only 11.4% of patients below 55 years-old left home for

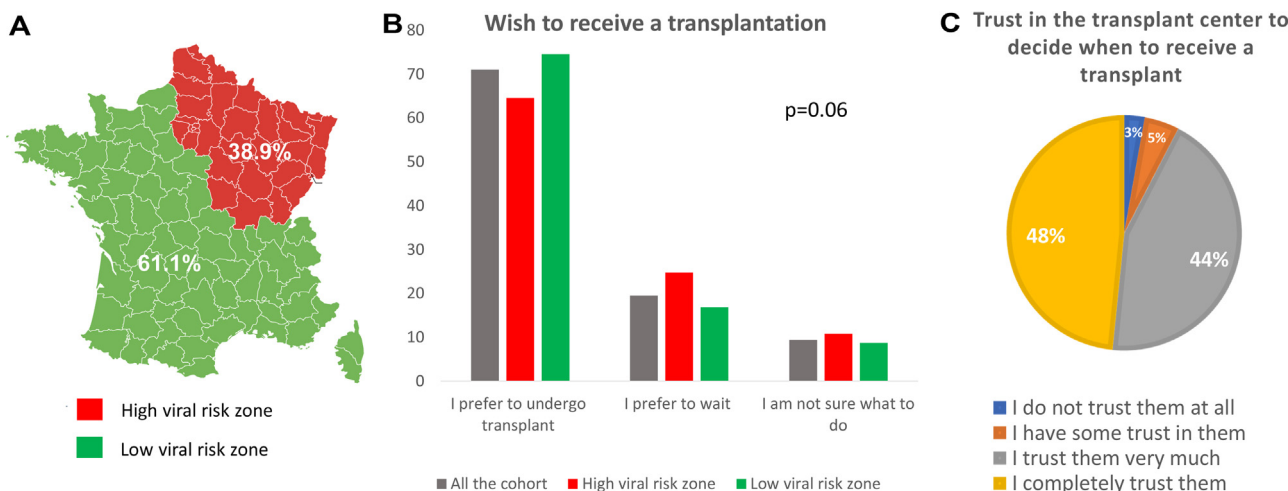


Fig. 1. SARS-CoV2 circulating zones and distribution of patients who answered the survey. In France, regions which had both a high prevalence of Covid-19 and/or a saturation of intensive care units were classified as a high viral risk zone (Red). The others were defined as low viral risk zones (Green) (A). Among patients on the waiting list, the wish to receive a transplant is reported in all the cohort and according to the viral risk zone (B), as well as their trust in their transplant center to decide when to receive a transplant (C).

work. Finally, around 90% of patients had access to hand sanitizer and masks.

3.3. Symptoms and diagnosis of Covid-19

The distribution of recipients and candidates was similar in the low and the high-risk zone (data not shown). Patients residing in low risk zones were less likely to having been exposed to someone with Covid-19 than those residing in high-risk zones (0.6% vs. 2.9%; *P* < 0.001). Reporting of Covid-19 related symptoms was similar between the low and high-risk zones (9% and 11.4%; *P* = 0.06). However, patients in the low-risk zones were less frequently tested

for Covid-19 than those in the high-risk zones (6.1% vs. 11.7%, respectively; *P* < 0.001). Finally, among those who were tested, 11.3% of patients in the low-risk zones and 16.9% of patients in the high-risk patients were positive for Covid-19 (*P* = 0.3).

Recipients were less frequently exposed to someone with Covid-19 than candidates (1.2% vs. 2.7%; *P* = 0.006) (Table 3). Around 10% of recipients and candidates experienced symptoms compatible with Covid-19 (*P* = 0.1). However, recipients were less frequently tested for Covid-19 than candidates (7.2% vs. 12.9%, respectively; *P* < 0.001). Finally, among those who were tested, 15.1% of recipients and 12.7% of candidates were positive for Covid-19 (*P* = 0.8).

Table 1
Patients characteristics..

	Kidney transplant recipients <i>n</i> = 2112	Waiting list candidates <i>n</i> = 487	<i>p</i>	<i>n</i>
Age (years), mean	55.1 ± 13.2	56.5 ± 13.0	0.032	2594
Male, <i>n</i> (%)	1322 (62.6%)	292 (60.0%)	0.303	2599
Familial situation, <i>n</i> (%)			0.391	1155
Single	248 (26.7%)	50 (22.1%)		
Living as a couple	470 (50.6%)	126 (55.8%)		
Divorced	149 (16.0%)	38 (16.8%)		
Widowed	62 (6.7%)	12 (5.3%)		
Education level, <i>n</i> (%)			0.287	2599
No diploma	287 (13.6%)	83 (17.0%)		
Middle school diploma	479 (22.7%)	115 (23.6%)		
High school graduate	366 (17.3%)	83 (17.0%)		
College graduate (2 years)	361 (17.1%)	74 (15.2%)		
College graduate (> 2 years)	619 (29.3%)	132 (27.1%)		
No. people at home, mean	2.3 ± 1.2	2.2 ± 1.2	0.439	2595
Internet at home, <i>n</i> (%)	2029 (96.1%)	461 (94.7%)	0.203	2599
TV at home, <i>n</i> (%)	1969 (93.2%)	446 (91.6%)	0.238	2599
Smartphone, <i>n</i> (%)	1795 (85.0%)	403 (82.8%)	0.245	2599
Tablet, <i>n</i> (%)	1145 (54.2%)	257 (52.8%)	0.600	2599
Computer, <i>n</i> (%)	1826 (86.5%)	396 (81.3%)	0.005	2599
Time on the waiting list, <i>n</i> (%)				487
Less than 1 year		158 (32.4%)		
Between 1 and 2 years		133 (27.3%)		
Between 2 and 3 years		79 (16.2%)		
Between 3 and 4 years		49 (10.1%)		
Between 4 and 5 years		25 (5.1%)		
More than 5 years		43 (8.8%)		

Table 2
Precautions to prevent COVID-19.

	Kidney transplant recipients <i>n</i> = 2112	Waiting list candidates <i>n</i> = 487	<i>p</i>	<i>n</i>
Leaving home during the epidemic				
Did you need to get out (yes)? <i>n</i> (%)	1465 (69.4%)	390 (80.1%)	< 0.001	2599
Leaving frequency, <i>n</i> (%)			< 0.001	1855
1–2 times per day	389 (26.6%)	108 (27.7%)		
2–3 times per week	317 (21.6%)	192 (49.2%)	< 0.001	
Once a week	402 (27.4%)	55 (14.1%)	< 0.001	
Twice a month	205 (14.0%)	21 (5.4%)	< 0.001	
Once a month	152 (10.4%)	14 (3.6%)	< 0.001	
To buy groceries, <i>n</i> (%)	1025 (48.5%)	263 (54.0%)	0.033	2599
To work, <i>n</i> (%)	165 (7.8%)	43 (8.8%)	0.514	2599
To practice sport, <i>n</i> (%)	550 (26.0%)	103 (21.1%)	0.029	2599
For religious services, <i>n</i> (%)	21 (1.0%)	3 (0.6%)	0.601	2599
For health care, <i>n</i> (%)	1251 (59.2%)	371 (76.2%)	< 0.001	2599
Did people living with need to get out (yes)? <i>n</i> (%)	943 (44.6%)	152 (31.2%)	< 0.001	2599
Home assistance and protective items				
Do you receive home assistance (yes)? <i>n</i> (%)	137 (6.5%)	43 (8.8%)	0.082	2599
Hand sanitizer, <i>n</i> (%)	1880 (89.0%)	448 (92.0%)	0.064	2599
Gloves, <i>n</i> (%)	1305 (61.8%)	334 (68.6%)	0.006	2599
Masks, <i>n</i> (%)	1880 (89.0%)	447 (91.8%)	0.086	2599

Table 3
COVID-19 symptoms and diagnosis.

	Kidney transplant recipients <i>n</i> = 2112	Waiting list candidates <i>n</i> = 487	<i>p</i>	<i>n</i>
No symptom, <i>n</i> (%)	1893 (89.6%)	448 (92.0%)	0.137	2599
Fever, <i>n</i> (%)	49 (2.3%)	11 (2.3%)	1.000	2599
Cough, <i>n</i> (%)	50 (2.4%)	8 (1.6%)	0.420	2599
Dyspnea, <i>n</i> (%)	72 (3.4%)	12 (2.5%)	0.357	2599
Fatigue, <i>n</i> (%)	120 (5.7%)	28 (5.7%)	1.000	2599
Anosmia, <i>n</i> (%)	16 (0.8%)	5 (1.0%)	0.573	2599
Have you been in contact with a COVID+ patient? <i>n</i> (%)			< 0.001	2599
I don't know	692 (32.8%)	122 (25.1%)	0.006	
No	1395 (66.1%)	352 (72.3%)		
Yes	25 (1.2%)	13 (2.7%)		
Have you been tested for COVID? <i>n</i> (%)	152 (7.2%)	63 (12.9%)	< 0.001	2599
Was the test positive? <i>n</i> (%)	23 (15.1%)	8 (12.7%)	0.803	215

3.4. Information and communication with transplant center about Covid-19

A significant number of patients did not receive any information regarding Covid-19 from their transplant center (recipients: 19.6% vs. candidates: 54.0%; $P < 0.001$) (Table 4). The main sources of information for recipients and candidates were television (81.1% and 82.3%; $P = 0.6$), the internet (66.9% and 61%; $P = 0.01$), transplant centers (41.9% and 12.1%; $P < 0.001$), and their primary care doctor (32.6% vs. 56.1%; $P < 0.001$). Recipients were more likely to be informed by the transplant center whereas candidates were more often informed by their primary care doctor.

More recipients were able to communicate with their transplant center than candidates (60.9% vs. 25.9%; $P < 0.001$). Phone and email were the two most commonly used tools by recipients and candidates, though they were more often used by recipients (41.0% vs. 15.2%, $P < 0.001$, and 35% vs. 9.7%, $P < 0.001$, respectively). Few recipients and candidates reported communication with their transplant center through videoconference (14.7% and 3.7%, respectively), or outpatient visits (9.7% vs. 6%; $P = 0.01$). Most of the patients were comfortable expressing their concerns regarding Covid-19 to their transplant center (Table 4).

3.5. Patients concerns

Recipients more frequently thought that the Covid-19 pandemic could affect their ability to work (33% vs. 22.8%; $P < 0.001$),

their ability to get medications (26.6% vs. 17.5%; $P = 0.002$), and their transportation to the hospital (24.4% vs. 17.7%; $P = 0.002$) than candidates (Table 5). Concern about the ability to work was highest among patients younger than 55 years (51.3% vs. 12.9%; $P < 0.001$). Those in high-risk vs. low-risk regions reported more concerns regarding the ability to buy food/necessities (19.7% vs. 15.9%; $P = 0.01$), obtain transportation to the hospital (28.6% vs. 19.6%; $P < 0.001$), and ability to work (34.3% vs. 29%; $P = 0.006$).

The majority of transplant recipients and a large number of candidates reported being concerned or very concerned about being infected by Covid-19 in the hospital (54% vs. 38%; $P < 0.001$) (Table 4). Similarly, many recipients and candidates reported being concerned or very concerned about becoming infected in the community (45.9% vs. 35.4%; $P < 0.001$). By comparison, only 13.1% of recipients and 10.3% of candidates reported concerns with infection in their homes. Patients in the high-risk zone more often reported being concerned or very concerned about becoming infected than those of the low-risk zone (data not shown).

3.6. Waiting list candidates and wish to be transplanted

Among candidates, 71% preferred to undergo transplant as soon as possible, 19.5% preferred to wait until Covid-19 had left their community, and 9.4% were not sure what to do. The percentage of patients preferring to undergo transplant was higher in the low-risk zone vs. the high-risk zone, though this did not reach statistical significance (low: 74.5% vs. high: 64.5%; $P = 0.06$) (Fig. 1B).

Table 4
Patients information and communication with the transplant center about COVID-19.

	Kidney transplant recipients <i>n</i> = 2112	Waiting list candidates <i>n</i> = 487	<i>p</i>	<i>n</i>
Did you receive information from your transplant center about specific COVID-19 risks?				
I received, <i>n</i> (%)			< 0.001	2599
No information	415 (19.6%)	263 (54.0%)	< 0.001	
Few information	552 (26.1%)	120 (24.6%)		
A lot of information	308 (14.6%)	35 (7.2%)	< 0.001	
A complete information	837 (39.6%)	69 (14.2%)	< 0.001	
What are your sources of information about COVID-19?				
Friends/Family, <i>n</i> (%)	587 (27.8%)	139 (28.5%)	0.783	2599
Pharmacist, <i>n</i> (%)	342 (16.2%)	89 (18.3%)	0.296	2599
Primary care doctor, <i>n</i> (%)	689 (32.6%)	273 (56.1%)	< 0.001	2599
Transplant center, <i>n</i> (%)	885 (41.9%)	59 (12.1%)	< 0.001	2599
Newspapers, <i>n</i> (%)	462 (21.9%)	131 (26.9%)	0.020	2599
TV, <i>n</i> (%)	1712 (81.1%)	401 (82.3%)	0.556	2599
Social networks, <i>n</i> (%)	693 (32.8%)	167 (34.3%)	0.567	2599
Internet, <i>n</i> (%)	1413 (66.9%)	297 (61.0%)	0.015	2599
Patients associations, <i>n</i> (%)	285 (13.5%)	44 (9.0%)	0.010	2599
Communication with the transplant center				
Do you communicate with your transplant center? (Yes, %)	1288 (60.9%)	126 (25.9%)	< 0.001	2599
How do you communicate with your transplant center?				
Videoconference, <i>n</i> (%)	310 (14.7%)	18 (3.7%)	< 0.001	2599
Phone, <i>n</i> (%)	865 (41.0%)	74 (15.2%)	< 0.001	2599
Emails, <i>n</i> (%)	740 (35.0%)	47 (9.7%)	< 0.001	2599
Outpatient visits, <i>n</i> (%)	205 (9.7%)	29 (6.0%)	0.012	2599
Mail, <i>n</i> (%)	71 (3.4%)	8 (1.6%)	0.065	2599
Feelings about expressing concerns about COVID-19 and transplantation				
To express my concerns I feel, <i>n</i> (%)			0.003	2599
Not at all comfortable	205 (9.7%)	60 (12.3%)		
Somewhat comfortable	130 (6.2%)	38 (7.8%)		
Comfortable	911 (43.1%)	232 (47.6%)		
Very comfortable	866 (41.0%)	157 (32.2%)	0.003	

Similarly, there was no reported difference in those interested in proceeding with transplant by time on the waiting list (< 2 years: 68% vs. > 2 years: 75.5%; $P=0.06$). Finally, 48% and 44% of candidates trusted their transplant center completely or very much for deciding when to receive a transplant, respectively (Fig. 1C).

4. Discussion

Kidney transplantation improves patient quality of life and survival by getting patients off dialysis [14,15], but it could lead to increase the risk and susceptibility to Covid-19 [5]. While the second wave of the pandemic arrives in France and around the world, transplant physicians ignore what is the most appropriate replacement therapy for patients with end-stage renal disease. Therefore, a dialogue about risk-benefit, which respects the patient's perspective, and the concept of share decision-making, are of paramount importance.

In this study conducted in France, it was striking that a majority of surveyed patients wished to be transplanted despite the pandemic. This was true in both high-risk and low-risk areas, in those having been on the waiting list for more or less than 2 years, and despite more than 50% of patients reporting to be concerned or very concerned about Covid-19 transmission in the hospital. The high level of trust reported by patients towards their transplant center may help explain this finding. Importantly, the 30% of patients who preferred to defer transplantation may require a more intensive communication.

Of note, kidney transplant patients appeared to have better home confinement and less contact with Covid-19 patients. Further, many more candidates reported leaving their home for health care. This may be due to patients coming off dialysis following kidney transplantation, an important consideration given the risks of Covid-19 transmission in the in-center dialysis

setting [16]. Although dialysis centers were reorganized to provide safe isolation areas for patients awaiting viral test results [17], up to 20% of dialysis patients developed Covid-19 in high prevalence areas with clustering in specific units [16].

Regarding communication between transplant centers and patients, it is notable that 27.4% of all patients and 54.4% of candidates reported having received no information about Covid-19 risks from their transplant center. This proportion may be in fact greater, as we were only able to reach those patients who had internet access. This highlights challenges to direct patient communication for transplant centers, as well as an urgent need to work with national organ procurement agencies to create national mailing lists and to collaborate with the transplant societies to disseminate patient recommendations quickly.

For wait-listed patients, the healthcare professional having provided the most information was their primary care doctor, and also likely their nephrologist. While transplant centers in France may be in regular and close communication with referring nephrologists in dialysis centers, the patients may not experience this communication directly. Given that transplant centers rely on being able to communicate with patients to inform them of an organ offer, more robust communication tools are important. In the UK, the Transplant Alert App has been developed to notify and communicate with patients regarding time sensitive organ offers, and it may be that such tools could be repurposed to facilitate improved real time communications with patients (<https://www.mftapps.co.uk/support-TAA>).

Examining care delivery during the lockdown, only 10% of kidney transplant recipients reported attending outpatient visits. This is consistent with the recommendations of transplant societies [11]. Surprisingly, in this population of internet connected patients, videoconference was used infrequently. Telephone was most often used for communicating with the transplant center. This is despite the fact that most transplant

Table 5
Concerns about COVID-19.

	Kidney transplant recipients n = 2112	Waiting list candidates n = 487	p	n
COVID-19 will negatively affect				
Afford my medications, n (%)	69 (3.3%)	18 (3.7%)	0.738	2599
Obtain my medications, n (%)	562 (26.6%)	85 (17.5%)	< 0.001	2599
Transportation to hospital, n (%)	515 (24.4%)	86 (17.7%)	0.002	2599
Buy food/necessities, n (%)	376 (17.8%)	76 (15.6%)	0.277	2599
Pay bills, n (%)	254 (12.0%)	55 (11.3%)	0.709	2599
Health insurance, n (%)	122 (5.8%)	20 (4.1%)	0.177	2599
Ability to work, n (%)	696 (33.0%)	111 (22.8%)	< 0.001	2599
No concern, n (%)	743 (35.2%)	254 (52.2%)	< 0.001	2599
Concerns about being infected by COVID-19				
At home, n (%)			0.009	2599
Very concerned	75 (3.6%)	11 (2.3%)		
Concerned	201 (9.5%)	39 (8.0%)		
Little concerned	714 (33.8%)	138 (28.3%)		
Not concerned	1122 (53.1%)	299 (61.4%)	0.008	
In the community, n (%)			< 0.001	2599
Very concerned	279 (13.2%)	47 (9.7%)		
Concerned	690 (32.7%)	125 (25.7%)	0.021	
Little concerned	927 (43.9%)	239 (49.1%)		
Not concerned	216 (10.2%)	76 (15.6%)	0.006	
At the hospital, n (%)			< 0.001	2599
Very concerned	457 (21.6%)	63 (12.9%)	< 0.001	
Concerned	685 (32.4%)	122 (25.1%)	0.012	
Little concerned	718 (34.0%)	189 (38.8%)		
Not concerned	252 (11.9%)	113 (23.2%)	< 0.001	

centers were equipped for this at the onset of the pandemic. It is unclear if this is due to patient or transplant center preference but is worth exploring to ascertain whether technology is matched appropriately with specific populations to maximize access to quality care.

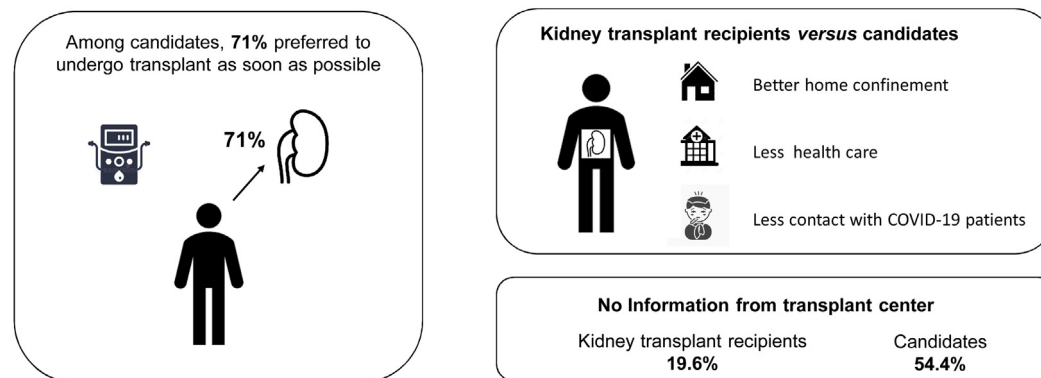
Finally, the incidence of symptoms compatible with Covid-19 was 10% in both groups. However, recipients were less likely to be tested for Covid-19. A shortage of SARS Cov2 RT-PCR in France possibly explains why all symptomatic recipients were not tested. By comparison, in order to avoid the dissemination of Covid-19 in dialysis units, a systematic screening strategy was recommended in all dialysis patients suspected of Covid-19 [18]. This observation could lead to an underestimated incidence of Covid-19 in the

transplant population in France, and serological studies could help to reappraise the epidemiology of this infection.

The main limitations of this study are the low response rate and use of a convenience sample of patients with internet access. These raise the potential for sampling bias potentially limiting external generalizability to those without internet access and with lower health literacy. Moreover, we did not ask whether transplant candidates were on dialysis or not. Finally, this survey was administered at the end of the lockdown period, when the pandemic severity was decreasing, which could have affected patient attitudes towards transplant. Nonetheless, our findings represent the views of over 2600 patients and could help to improve patients' care during the second wave of the pandemic.



The **Cowait study** used a short survey to understand the behaviors, concerns, and priorities of **2112** kidney transplant recipients and **487** waiting list candidates at the end of the first wave of the pandemic in France: from 11 May 2020 to 23 May 2020 (ClinicalTrials, Identifier: NCT04376775).



Conclusion: This study highlights the importance of transplant centers engaging patients in decision making and planning during the pandemic

Fig. 2. Impact of Covid-19 on kidney transplant and waiting list patients: Lessons from the first wave of the pandemic.

This survey is currently used in the ICOT study (Impact of Covid On Transplant Candidates and Recipients) at the Duke University and it will be interesting to compare our findings.

5. Conclusion

These data represent a large survey of transplant patients at the end of the first wave of the Covid-19 pandemic, providing actionable insights into the patient experience to inform care. The majority of patients prioritized kidney transplant during the pandemic, despite reporting limited communication from their transplant center and significant concern for Covid-19 transmission in the hospital and community. Further, it highlights the need for reliable and accessible communication strategies between transplant centers and patients (Fig. 2). Given the ongoing challenges represented by Covid-19, these data underscore the importance of transplant centers engaging patients in decision making and planning during the pandemic.

Disclosure of interest

The authors declare that they have no competing interest.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <https://doi.org/10.1016/j.nephro.2020.12.004>.

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