7-1-2022

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Recommended Citation

Segovia M, Fernandez MF, Rumbo C, Zanfi C, Herlenius G, Testro A, Sharkey L, Braun F, Jafri SM, Vilca Melendez H, Sanchez Claria R, Ceulemans LJ, Hibi T, Solar H, Ramisch D, Noel G, Yap J, Dijkstra G, Schiano T, Friend P, Lacaille F, Sudan D, Mazariegos G, Horslen S, and Gondolesi GE. The Effect of the COVID-19 Pandemic in Intestinal Rehabilitation and Transplant Patients: Initial Results of the Intestinal Rehabilitation and Transplant Association's International Survey. Transplantation 2022; 106(7):1289-1292.

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The Effect of the COVID-19 Pandemic in Intestinal Rehabilitation and Transplant Patients: Initial Results of the Intestinal Rehabilitation and Transplant Association's International Survey

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INTRODUCTION

The World Health Organization declared the coronavirus disease 2019 (COVID-19) outbreak as a global public health emergency on January 30, 2020, and as a pandemic on March 11th of the same year.

Worldwide, health systems had to rapidly adapt and change their practices to prioritize the care provided, favoring COVID-19–infected patients and emergent cases, including transplants.[1-9]

Patients with intestinal failure (IF) have unique pathophysiology and require care with frequent home visits from their parenteral nutrition (PN) teams, whereas intestine transplant (IT) patients are highly immunosuppressed. Therefore, both groups are considered highly susceptible to COVID-19.[10-12]

During the pandemic, multidisciplinary IF teams had to adapt their clinical approaches to protect this vulnerable group of patients by reducing the number of visits, implementing

Received 20 August 2021. Revision received 24 December 2021.

Accepted 26 January 2022.

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M.S., M.F.F., and G.E.G. participated in research design, acquisition of data, data analysis, writing of the article, and critical review. C.R., C.Z., G.H., A.T., L.S.L., F.B., H.V.M., R.S.C., L.J.C., T.H., H.S., D.R., G.N., J.Y., G.D., T.S., P.F., F.L., and D.S. participated in acquisition of data. S.M.J. participated in research design, acquisition of data, and data analysis. G.M. participated in acquisition of data and critical review. S.H. participated in research design, acquisition of data, and critical review.

The authors declare no funding or conflicts of interest.

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ISSN: 0041-1337/20/1067-1287

DOI: 10.1097/TP.0000000000004112

<zdoi;10.1097/TP.0000000000004112>

telemedicine, and carefully evaluating the impact of increasing home self-care, reducing the number of visits of nurses or PN suppliers, and by modifying the posttransplant follow-up protocols, including surveillance biopsies.[10,11]

Among all the published articles and specifically when looking into surveys that pertain to the transplant community, no specific data are available to understand the impact of the disease on the IT population.

Therefore, we developed a step-up survey approach aiming to describe the impact of the COVID-19 disease on patients treated by IF and IT units worldwide.

MATERIALS AND METHODS

This is a retrospective, multicenter study with 3 surveys, developed using Google forms: the first one (practices) aimed to determine if a given center had experience with COVID-19–positive IF or IT patients, the impact of the disease on the center activity, and general measures followed. Surveys 2 and 3 (outcomes) aimed to obtain information about the clinical presentation, treatment, and outcomes of IF and IT patients who acquired COVID-19 infection, respectively.

Surveys were sent via email to 32 centers around the world. These were identified using the registry of the Intestinal Rehabilitation and Transplant Association. Answers received between January and July 2021 were analyzed. Statistical analyses were performed using Statistical Package for Social Sciences (SPSS) version 20.0.

RESULTS

Survey 1—Practices

Seventeen centers (53%), located in 11 countries (Belgium, the Netherlands, France, Italy, Germany, Japan, United Kingdom, Sweden, Australia, United States, and Argentina), completed the survey. Eleven of the 17 centers (65%) did not have a moratorium on performing rehabilitation surgery or IT procedures. Six centers did have a 3 (±4) mo moratorium, limiting access to IT for those patients listed for isolated intestine and those requiring combined liver-intestine or multivisceral transplant (MVT) with low pediatric end stage liver disease or model of end stage liver disease-Na scores (<20).

Nine centers (53%) delayed their routine follow-up and "protocol" biopsies in the post-IT or MVT patients because of the hospital restrictions to nonurgent medical procedures. Up to the time of completion of this study, no higher rate of rejection or infectious complications was observed in any of the centers. These also reported that new referrals were affected: 3 of the 9 had a decrease of approximately 10% compared with 2019; 4 were closer to 20%; 1 had a decrease of 50%; and the last one exceeded 50%. Furthermore, in-person consults were replaced by "virtual encounters"; 16 centers (94%) incorporated "telemedicine" as part of their daily practice. Only 2 reported that the pandemic affected rehabilitation services such as home nursing care and interruption of PN deliveries.

In the first survey, 10 of the 17 centers (59%) reported having COVID-19 cases; therefore, the second and third surveys were sent only to those centers.

Survey 2—Outcomes: IF Population

In the IF group, centers reported managing a total of 1270 patients under their program. Of these patients, 11 (0.9%) were found to be positive for COVID-19, with all of them diagnosed by polymerase chain reaction testing: 8 were male, 7 adults (mean age 60 ± 8 y), and 4 children (mean age 8 ± 4 y).

Nine of them were symptomatic; prevalent symptoms are reported in Figure 1; 1 had HIV and 1 had chronic

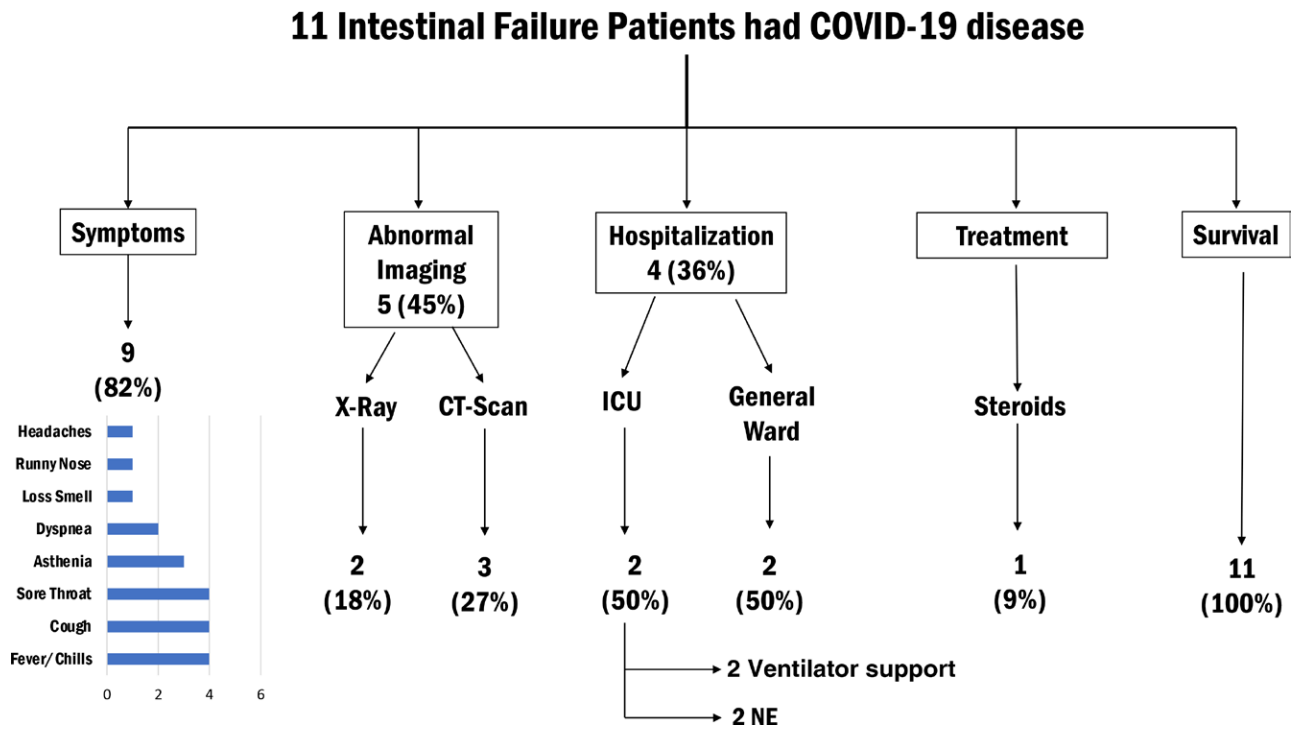

FIGURE 1. Presentation, course, and outcomes of reported IF patients with COVID-19. COVID-19, coronavirus disease 2019; CT, computed tomography; ICU, intensive care unit; IF, intestinal failure; NE, norepinephrine.

obstructive pulmonary disease; 54.5% had been on PN for >30 mo. Hospitalization was necessary in 4 of the 11 (36%) patients, with 2 requiring admission to the intensive care unit because of disease progression. Both patients needed mechanical ventilation and vasopressors support (norepinephrine). Steroids were used as therapy in only 1 case. All patients survived (Figure 1).

Survey 3—Outcomes: IT Population

In the IT group, centers reported managing a total of 308 posttransplant patients. Of these patients, a total of 14 (4.5%) were found to be positive for COVID-19: 13 of them were diagnosed by polymerase chain reaction testing and 1 with antibody testing. Eight were female, with all of them being adults (mean age 47±16 y). Nine received isolated IT, 2 had MVT, 2 had modified MVT, and 1 had a combined liver-intestine.

Maintenance immunosuppression consisted of tacrolimus (10 patients), corticosteroids (7), azathioprine (5), mammalian target of rapamycin inhibitors (4), cyclosporine (2), and mycophenolate (2).

Thirteen patients were symptomatic at presentation; prevalent symptoms are reported in Figure 2. Seven had abnormal chest x-rays, whereas in 3 cases, severe bilateral pneumonia was seen in follow-up computed tomography scans, determining the need for admission.

Immunosuppression management was discontinued in 1 patient, decreased in 5 (all on tacrolimus), and left unchanged in 8 cases. Morbidity, treatment needed, and survival are reported in Figure 2, and mortality was reported in 3 cases (Figure 2).

DISCUSSION

Since the original description of the COVID-19 disease, the virus has rapidly spread and mutated worldwide, becoming a progressive and unsolved pandemic. Its impact on the transplantation field was initially documented in the Italian transplant community, where the mortality rate reached 31%, with a higher index in the heart transplant recipients and in those aged >67 y but without including IT recipients.[1-5] Similar information was presented reporting higher mortality in transplant candidates.[6,7]

Loupy et al, in France and United States,[8] and the web based international COVID-19 registry developed by the Donation and Transplant Institute Foundation, described a higher mortality rate in solid organ transplant recipients than the general population; however, IT recipients were not reported in their database.[9]

A MeSH search in PubMed using the terms "intestinal failure" and "COVID-19" retrieved a total of 48 articles. The first report from Allan et al describes 45 adult and 1 pediatric patient with IF diagnosed with COVID-19. The vast majority of the cases was thought to be a result of the close contact with their home nursing care team. Three patients, all adults, died as a consequence of the disease.[10] By conducting an international survey, the same author was able to obtain information from 78 of the 122 (57%) home PN centers, reporting 37 positive patients and 2 deaths from 18 centers.[11] Our survey contributes by providing an incidence report for IF patients, which is lower than cirrhotic, dialysis, and IT patients.[6,7]

The PubMed search using the keyword "Intestinal Transplant and COVID-19 cases" reported only 1 IT case (from Hospital La Paz in Spain).[12] Our survey has collected a larger series of IT recipients having COVID-19 and highlights that, despite being the solid organ transplant performed with the lowest frequency worldwide, recipients have outcomes (including mortality rate) comparable with those of the other solid organ recipients having the disease.

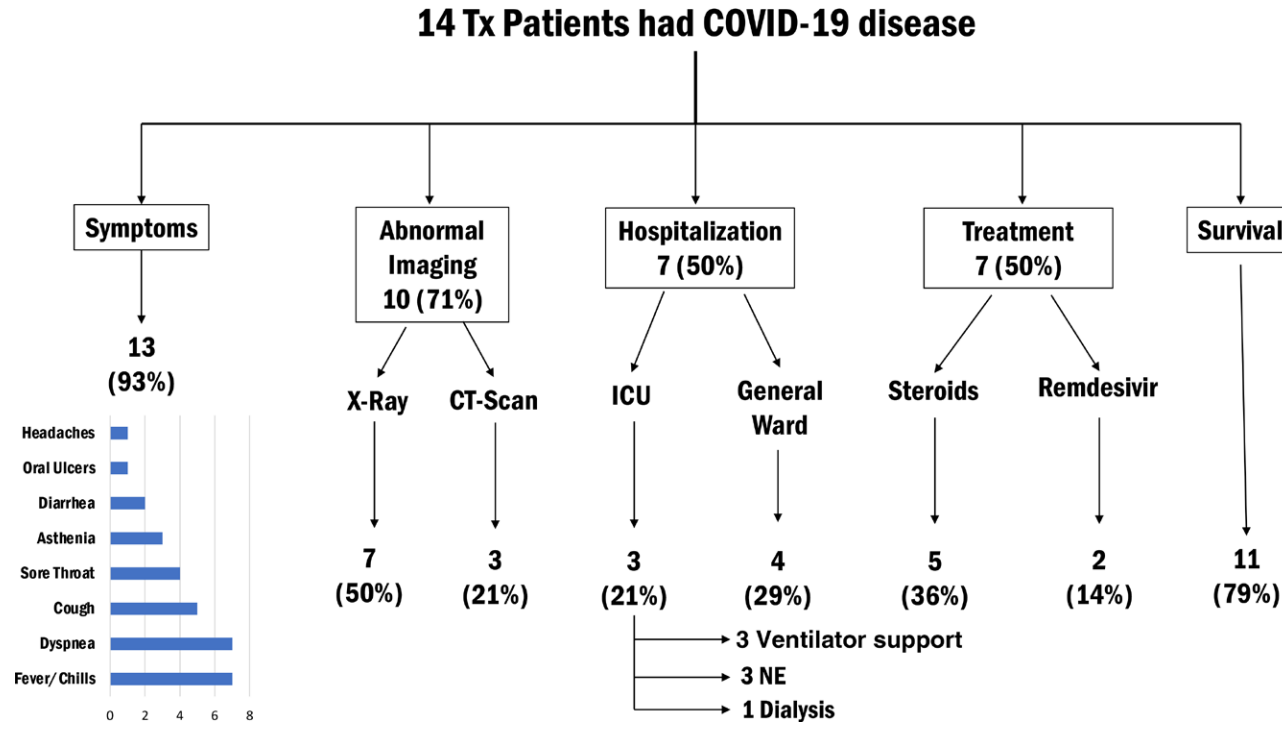

FIGURE 2. Presentation, course, and outcomes of reported IT patients with COVID-19. COVID-19, coronavirus disease 2019; CT, computed tomography; ICU, intensive care unit; IT, intestine transplant; NE, norepinephrine; Tx, transplant.

The evolution of the pandemic and the different prevalence in each individual country forced centers to alter their standard protocols for IT follow-up. In our survey, this did not cause an increase in the number or severity of rejection episodes or in other clinical complications.

Data on vaccinations and their effect on our cohort of patients are missing because surveys were sent before they were massively approved and available. Long-term data collection from multicenter studies will be required to expand on the real-life impact of COVID-19 disease in this population.

ACKNOWLEDGMENTS

The authors acknowledge Suzanne Landis (IRTA secretary) and Patricia Casetta (official English translator) for assisting with the English editing process.

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