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A local response to COVID-19 for advanced liver disease: Current model of care, challenges and opportunities

To the Editor:
We read with great interest the work by Tapper and Asrani in the recent issue of the *Journal of Hepatology*.[1] While we share the authors' concerns about care disruptions and the long-term negative consequences for cirrhosis care, we posit that the future of cirrhosis care need not be painted in such stark colors. In fact, the pandemic has created an unprecedented natural experiment, teaching us valuable lessons about patient care that can be both long-lasting and life-saving. Herein, we provide an example of local coordinated response to COVID-19 from the University of Pennsylvania (UPENN), a large, diverse, tertiary-care center and liver transplant program in the US with a catchment area extending up to 160 km.

Changes in clinical care

Major shifts in clinical care due to COVID-19 began on 16 March 2020. Prior to this date, our multi-disciplinary team worked with health-system leaders on a coordinated response based on prioritizing lifesaving therapies for the sickest, deferring elective care in cases where it was safe to do so, and altering care delivery models to telemedicine and remote monitoring to maintain contact and routine care activities for our active population of patients with advanced liver disease.

Telemedicine use, remote monitoring, and current management

At the beginning of the COVID-19 response, we leveraged the electronic health record's (EHR) online portal to routinely communicate with patients about COVID-19 symptoms, appropriate behavior, and how to contact the medical team with questions and concerns. We have also leveraged the EHR to proactively generate reports on cancelled patient visits. From 1 March 2020 to 26 April 2020, 910 individual patients with advanced liver disease or post-transplant were originally scheduled in outpatient clinics. Of those, 505 (56%) appointments were kept as scheduled, 334 (37%) were rapidly rescheduled and, 12 (1.3%) are scheduled in the future, and 60 (6.6%) have yet to be rescheduled. Building on our previous experience, we shifted up to 69% of our visits to telemedicine within a 6-week period (Fig. 1).[2] We have initiated home-based, remote monitoring for decompensated cirrhosis using UPENN's online portal[3] that interfaces with patients' or caregivers' cellphones to monitor symptoms, enrolling 35 patients in the first week of program initiation.

We have postponed elective variceal surveillance, however, we use guideline-recommended beta blocker prophylaxis in newly identified cases of clinically significant portal hypertension.[4,5] To conserve healthcare resources, we have maintained limited but essential endoscopy for serial banding in those who recently bled from varices, facilitated new clinical evaluations in those with severe clinical situations of recent onset of jaundice, severe hepatitis, new hepatic decompensation, while hepatocellular carcinoma (HCC) case assessment and therapy has continued in an uninterrupted manner. While surveillance for HCC could be delayed for a couple of months until we achieve re-entry and "the new normal", those patients currently willing to accept HCC surveillance are undergoing imaging studies. Further, patients with high model for end-stage liver disease scores continue to be transplanted at our center as these procedures are clearly nonelective.[6] We have been quite judicious, but uncompromising by limiting outpatient laboratory exposure for our patients with cirrhosis and after liver transplant, while recently transplanted patients have been provided home nurse or mobile laboratory blood drawing to follow essential care parameters.

Ongoing challenges, future uncertainty, and areas of opportunity

Despite active population management, use of technology, and close communication between our physicians and community-based providers, multiple challenges remain. In order to reserve resources to battle COVID-19, our health system initially limited hospitalizations and inpatient transfers to severe, life-threatening cases or in situations where the need for transplantation was imminent, although within a short period of time re-entry strategies that include elective surgeries are being implemented. It is not yet clear how many needed hospitalizations were deferred in the community or what long-term sequelae this may have. We also recognize that patient perceptions alter their willingness to accept routine blood tests and imaging studies that could also negatively impact quality of care.

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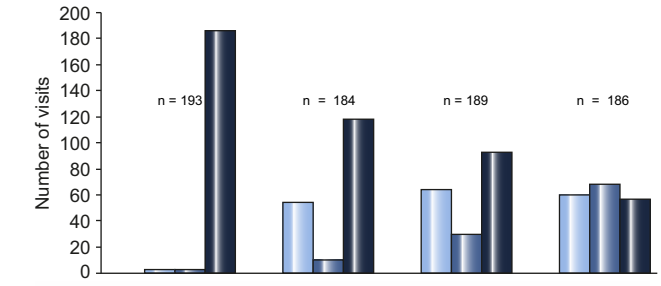

Fig. 1. Advanced liver disease and post-liver transplant visits from 2 March to 26 April, 2020 stratified by 2-week interval and visit modality (n = 752).

We do not yet have data on those with alcohol use disorders, relapse rates, or attendance in "virtual rehabilitation".

Notwithstanding the ongoing difficulties and uncertainty, we are learning valuable lessons about leveraging technology, being proactive in reaching out to patients, caregivers, and referring providers, and rapidly refining our processes to handle ongoing challenges. The most valuable lesson is how adaptable we can be in the face of adversity. While we do not believe that the COVID-19 disruption has led to apocalyptic consequences for our local patient population, we also cannot lose sight of the fact that well-resourced transplant and tertiary care centers are better-positioned in these challenging times. It is, therefore, incumbent upon us to continue to share detailed and contemporaneous outcome data as it becomes available and disseminate best practices that will last far beyond this crisis.

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Authors' contributions
All authors drafted and reviewed the letter for intellectual content. MS obtained and analyzed data.

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Lack of genetic evidence that fatty liver disease predisposes to COVID-19

To the Editor:
We read with interest the manuscript by Ji and coworkers, reporting that among 202 Chinese individuals with COVID-19,[1] those with likely metabolic-associated fatty liver disease (MAFLD) had a higher probability of abnormal liver function tests and disease progression than those without. Obesity and dysmetabolism are highly associated with severe COVID-19,[2] raising the possibility that fatty liver directly mediates inflammation and hypercoagulation leading to respiratory and systemic complications of COVID-19.[3] Alternatively, fatty liver may indirectly favor replication of the SARS-CoV-

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