

Cirrhocare-a pilot study of digital home-monitoring of advanced cirrhosis to determine feasibility and utility to diagnose new decompensation events

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Background and aims

Patients discharged from hospital following acute decompensation are at high risk of new complications and need close follow-up, limited currently by the growing burden of cirrhosis and impact of COVID-19. Specialist hepatology care in the community is an urgent unmet need, to reduce hospital exposure and manage new decompensation events.

Methods

We included 20 patients with cirrhosis and recent acute decompensation. Commercially available devices and a smartphone were given to all patients for daily recording of ECG, blood pressure, weight, and % body-water (bioimpedance), Stroop test (hepatic encephalopathy (HE) assessment), as well as self-reported well-being and food/fluid/alcohol intake. Data was Blue-toothed to the Cirrhocare-App, which also had 2-way patient-physician communication. Clinical hepatologists evaluated daily data and facilitated interventions by phone/text messages on the app as required. A propensity matched control cohort (n=20) with advanced cirrhosis, screened after study recruitment closed, was followed as per monitored patients.

Results

Patient demographics: Mean age 59±10 years, 14 male, main etiology alcohol (75 %); 75 % Child-Pugh class B. Fifteen patients (75 %) showed good compliance, (≥4 readings/week), 2 had moderate compliance (2-4/week), and 3 had poor compliance (<2/week). In a usability questionnaire scored 1-10, the median score was ≥9 for any given question.

Median follow-up was 10.1 (IQR 9-12) weeks. One patient died and 1 received a liver transplant (OLT). Besides the planned OLT admission, 8 liver-related admissions occurred in 5 different patients, including one patient who died: 2 admissions due to HE, 1 to acute kidney injury (AKI), 1 to both AKI and HE, and 3 in the same patient to rectal bleeding. The median admission lasted 5 (IQR 4 – 11) days, and none was >14 days. Except for the acute bleeds, we identified signs of decompensation in all cases, e.g. failed Stroop test, hypotension or reduction/gain in weight and body fluid, and facilitated 2 short hospitalizations of the 8 total admissions.

Based on early signs of decompensation, we contacted patients on 16 other occasions, revealing new events and guiding intervention such as advice on fluid intake, diuretics and laxatives.

No control died or received OLT, and there were 11 liver-related admissions in 7 patients, lasting a median of 5.5 (IQR 3 – 12) days with two admissions >14 days. Controls had 5 unplanned paracenteses compared to 1 in monitored patients.

Conclusions

Cirrhocare's novel, multimodal, home-monitoring in patients with advanced cirrhosis is feasible, with good compliance, and prompts *early* diagnosis of decompensating events and their intervention; and hospital admissions are fewer and shorter in duration than in a control group. We propose Cirrhocare as a tool for managing cirrhosis patients at-risk of acute decompensation, at-home.