Updates From the NASPGHAN/SPLIT SARS-CoV2 International Registry

Reply: We acknowledge the authors of ''SARS-CoV-2 in pediatric liver transplant recipients: the European experience'' response to our article reporting the NASPGHAN/SPLIT SARS-CoV2 registry experience (1). In contrast, they note that liver transplant (LT) recipients had higher rates of hospitalization, including intensive care unit (ICU) admission, than patients with chronic liver disease (LD).

The NASPGHAN/SPLIT SARS-CoV2 international registry has increased to 180 LT recipients and 76 patients with LD (Table 1). In this expanded cohort, LT recipients were still less likely to require hospitalization (odds ratio [OR] = 0.32, 95% confidence interval [CI]: 0.17–0.59, $P < 0.0001$) or ICU level care (OR = 0.05, 95% CI: 0.010.17, $P < 0.001$) compared with LD patients. No LT recipients required mechanical ventilation or died of SARS-CoV2. Nine patients with LD required mechanical ventilation, and three patients with LD died. Differences between registry outcomes may be partially explained by the higher proportion of patients with obesity and NAFLD with LD in our cohort. Obesity is associated with worse outcomes in children with SARS-CoV2 infection (1,2–5). Buescher et al additionally suggest a role of combined immunosuppression leading to increased hospitalization in LT recipients. In our larger LT cohort, the degree of immunosuppression was not associated with higher odds of hospitalization (OR = 1.6, 95% CI: 0.69–3.8, $P = 0.20$).

TABLE 1. Baseline characteristics and clinical data for patients with disease of the native liver and liver transplant recipients with positive test for the severe acute respiratory syndrome coronavirus 2

	Disease of the native liver (N = 76)	Liver transplant recipient (N = 180)	*P* value
Baseline characteristics			
Age (y), median (IQR)	9.5 (4–16)	11.5 (5–17)	0.05
Male gender (%)	45 (59)	93 (52)	0.2
Primary liver condition (%)			<0.001
NAFLD	13 (17)	0	
Biliary atresia	18 (24)	85 (47)	
Acute liver failure	4 (5)	16 (9)	
Autoimmune hepatitis	13 (17)	7 (4)	
Metabolic	6 (8)	23 (13)	
Malignancy	3 (4)	18 (10)	
Other cholestatic liver disease	15 (20)	21 (12)	
Other	4 (5)	10 (6)	
Comorbid conditions (%)			
None	20 (26)	97 (54)	
Overweight/obesity	18 (24)	13 (7)	<0.001
Cardiac	10 (13)	22 (12)	0.8
Gastrointestinal	11 (14)	10 (6)	0.03
Pulmonary	6 (8)	11 (6)	0.6
Renal	2 (3)	16 (9)	0.07
Endocrine	4 (5)	5 (3)	0.4
Other autoimmune conditions	2 (3)	5 (3)	
Time since LT (y), median (IQR)	–	4.5 (2–11)	
Clinical data			
Presenting symptoms (%)			
Fever	27 (36)	49 (27)	
Respiratory symptoms	36 (47)	65 (36)	
Constitutional symptoms	11 (14)	23 (13)	
Gastrointestinal symptoms	18 (24)	29 (16)	
Asymptomatic	16 (21)	63 (35)	
Highest level of care (%)			
Outpatient	28 (37)	147 (82)	<0.001
Hospital floor	29 (38)	30 (16)	<0.001
ICU	19 (25)	3 (12)	<0.001
Highest respiratory support (%)			<0.001
None	60 (79)	177 (98)	
Nasal cannula/CPAP/BiPAP	7 (9)	3 (2)	
Mechanical ventilation	6 (8)	0	
High frequency oscillatory ventilation	3 (4)	0	
Final clinical outcome (%)			0.02
Death	3 (4)	0	
Recovery	67 (88)	175 (97)	
Still active in clinical course/pending	7 (8)	5 (3)	

ICU = intensive care unit; IQR = interquartile range; LT = liver transplant; N = number; NAFLD = non-alcoholic fatty liver disease.

We agree with Buescher et al regarding the utility of collaborative registry studies to inform the care of pediatric LT recipients and children with LD. Our registry continues to collect data (*https://bit.ly/NASPGHAN_SPLIT_COVIDregistry*). Ongoing submissions remain critical as we continue to explore variants, breakthrough infections, and antibody response to SARS-CoV2 vaccination in pediatric solid organ transplant recipients (6,7).

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