## Ann & Robert H. Lurie Children's Hospital of Chicago"

# **Clinically Evident Portal Hypertension (CEPH) is Associated with Low IGF-1** in Children with Chronic Liver Disease



#### Bridget Whitehead MD<sup>1</sup>, Saeed Mohammad MD<sup>1</sup>, Susan Kelly RN<sup>1</sup>, Katie Neighbors<sup>1</sup>, Jami Josefson MD MS<sup>2</sup>, Leena B Mithal MD MSCl<sup>3</sup>, Estella M Alonso MD<sup>1</sup>

their parent-proxy (88.89, p.002).

1 Division of Gastroenterology, Hepatology and Nutrition, Northwestern University, Feinberg School of Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago; 2 Division of Endocrinology, Northwestern University, Feinberg School of Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago; 3 Division of Infectious Disease, Northwestern University, Feinberg School of Medicine, Ann & Robert H. Lurie Children's Hospital of Chicago

Median PedsQL-MF scores from children (63.89) and parent-proxy (75.70) were significantly lower

compared to healthy children (83.33, p <.001) and

## Background

- Children with chronic liver disease exhibit growth hormone (GH) resistance which is an additional risk factor for sarcopenia and growth failure.
- Low IGF-1 is associated with multiple negative effects including fatigue in other pro-inflammatory states.
- Portal hypertension has not been studied as a risk factor for low IGF-1.

## **Methods**

- Children 3 months 18 years were recruited from an ambulatory hepatology clinic. Patients were categorized by presence or absence of portal hypertension<sup>1</sup>.
- Clinical data, nutritional assessment and serum samples for IGF-1 collected.
- · Patients with co-morbidities affecting inflammatory state, intestinal barrier function or the GH axis were excluded.
- The PedsQL Multidimensional Fatigue Scale (PedsQL-MF) was completed by parents and children.
- Low IGF-1 defined as Z score <-2. Low mid upper arm circumference (MUAC) defined as Z score <-1.
- Continuous variables between groups were analyzed using Mann Whitney U test.

### Results

•	Children with CEPH had lower IGF-1 Z-scores compared to those without CEPH (p = 0.003) with median Z scores -2.25 and -0.8 respectively.		Median (IQR)
		Age (years)	12.2 (7.5,14.9)
		Female	N=18 (66%)
•	Height and weight Z-scores had no association with IGF-1 Z-score.	СЕРН	Yes N=10 (37%)
		Weight Z Score	0.24 (-0.06, 0.74)
•	Low MUAC was associated with low IGF-1 Z-scores (p .036).	Height Z Score	-0.08 (-0.37, 0.028)
		MUAC Z Score (N=20)	-0.55 (=1.04, 0.11)
		IGF-1 Z Score	-1.5 (-2.4, -0.8)

#### Diagnosis



#### Conclusions

- CEPH is associated with lower IGF-1 Z-scores.
- Lower IGF-1 Z-scores are associated with an increased burden of fatigue in chronic liver disease.
- Next steps will include measurement of serum cytokines profiles and evaluation of the relationship between a proinflammatory state and IGF-1 Z-scores.

1. Bass LM, Shneider BL, Henn L, Goodrich NP, Magee JC; Childhood Liver Disease Research Network (ChiLDReN). Clinically Evident Portal Hypertension: An Operational Research Definition for Future Investigations in the Pediatric Population. J Pediatr Gastroenterol Nutr. 2019.

Research supported by the National Institute Of Diabetes And Digestive And Kidney Diseases of the National Institutes of Health under Award Number T32DK077662

