



Enhanced Liver Fibrosis (ELF) Scores in Related but Distinct Neonatal Populations.



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Background

Infants in the neonatal ICU are at risk for developing parenteral nutrition associated liver disease (PNALD). Identifying patients progressing towards liver fibrosis earlier would allow for targeted liver protective therapies. Current markers to evaluate liver fibrosis are nonspecific or have significant risks. Enhanced liver fibrosis (ELF) scores have recently been used to identify and quantify liver fibrosis children and adults. Normative data has not been established in the neonatal population.

Objective

Establish baseline ELF scores using hyaluronic acid (HA), tissue inhibitor of metalloproteinase-1 (TIMP-1) and amino-terminal propeptide of type III collagen (PIIINP) in term (T), preterm (PT) and high risk infants (HR) for liver fibrosis.

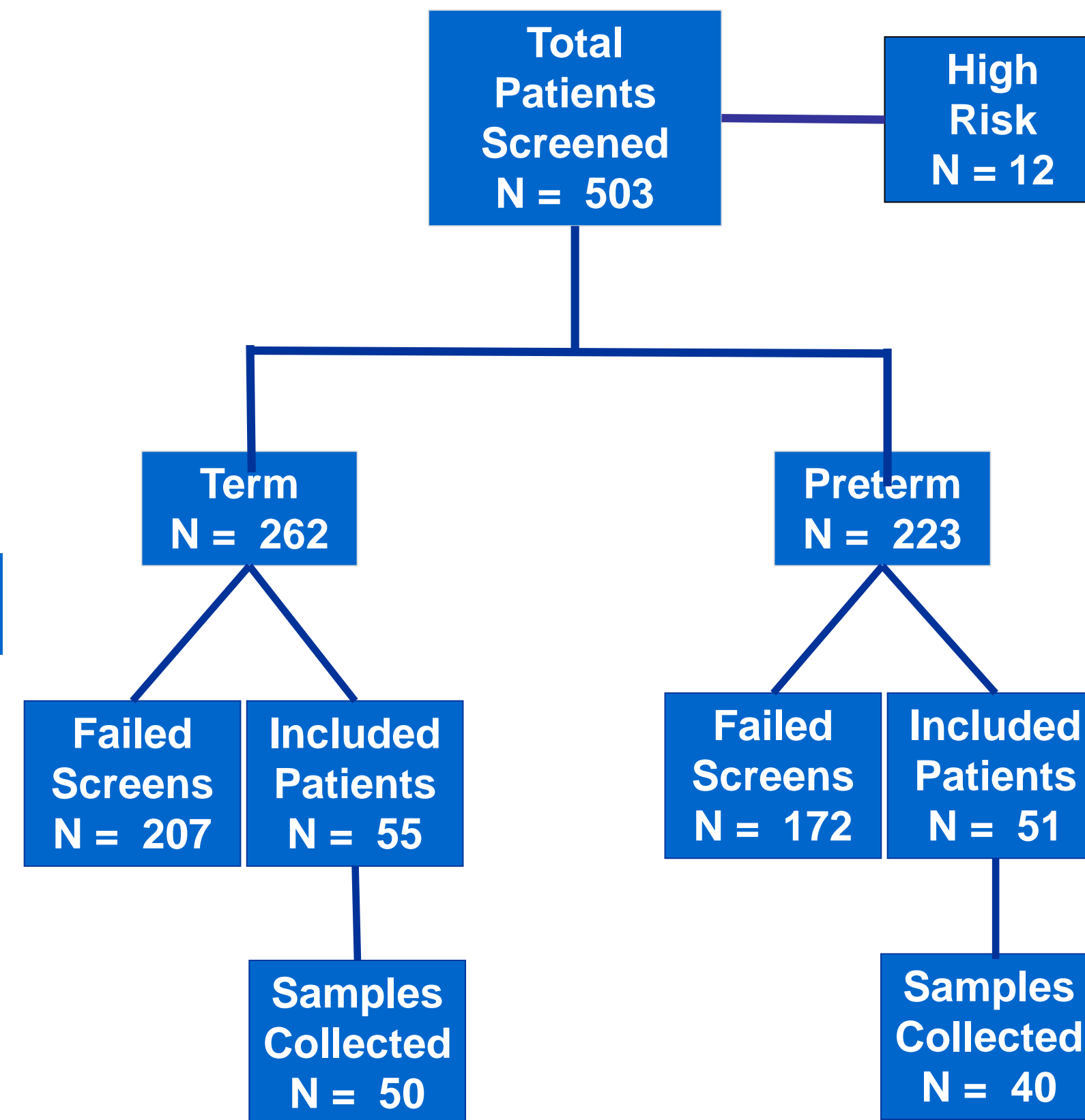
Methods

This is an observational study collecting banked cord blood from infants born at University Hospital.

50 Term Infants - ≥37 + 0/7 weeks	Exclusions - Hypoxic ischemic encephalopathy, fatal congenital anomalies/genetic abnormalities, and maternal diseases affecting liver function or hepatotoxic medications
50 Preterm Infants - ≤35 + 0/7 weeks	

25 High Risk Infants - gastrochisis, omphalocele, diaphragmatic hernia, jejunal atresia, birth weight < 750 grams, ECMO in the perinatal period

Enrollment

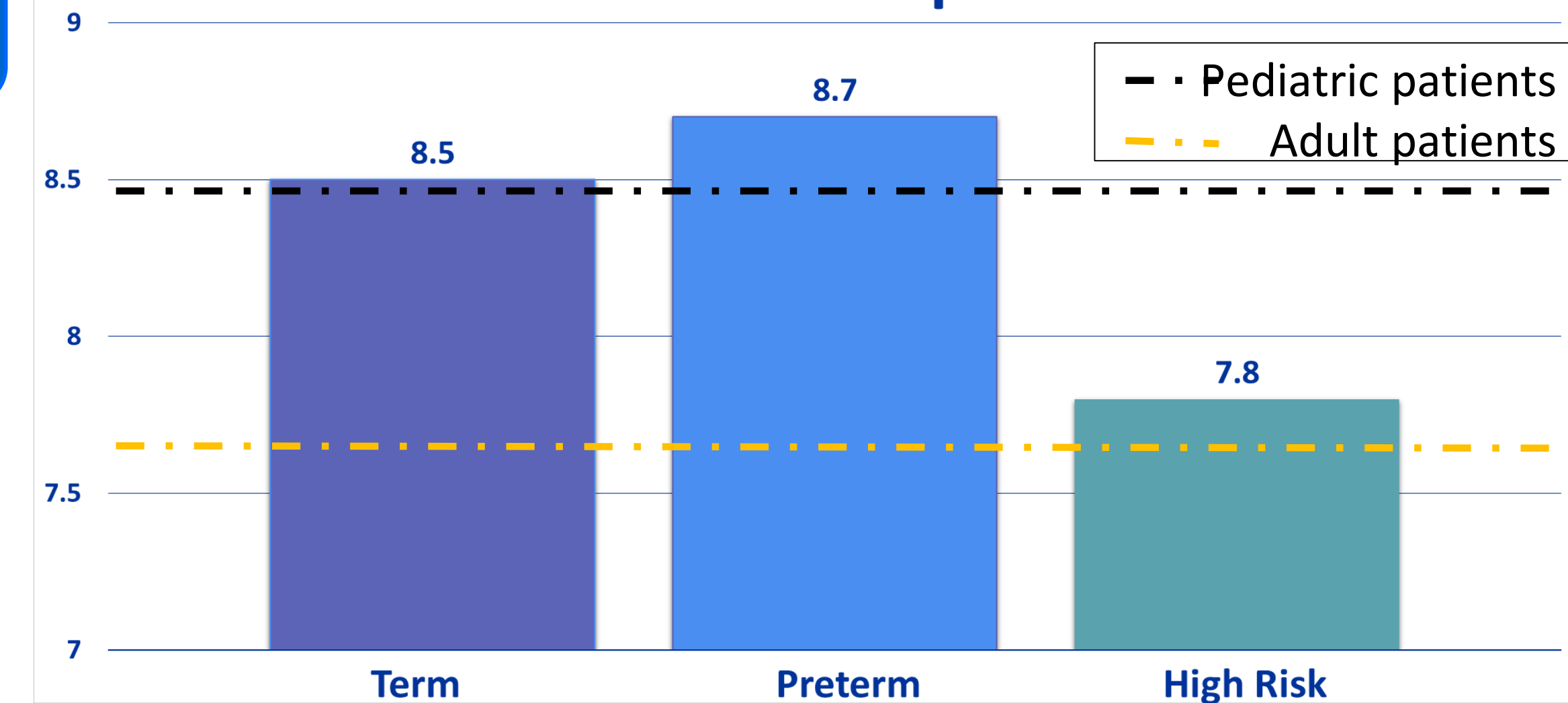


Results

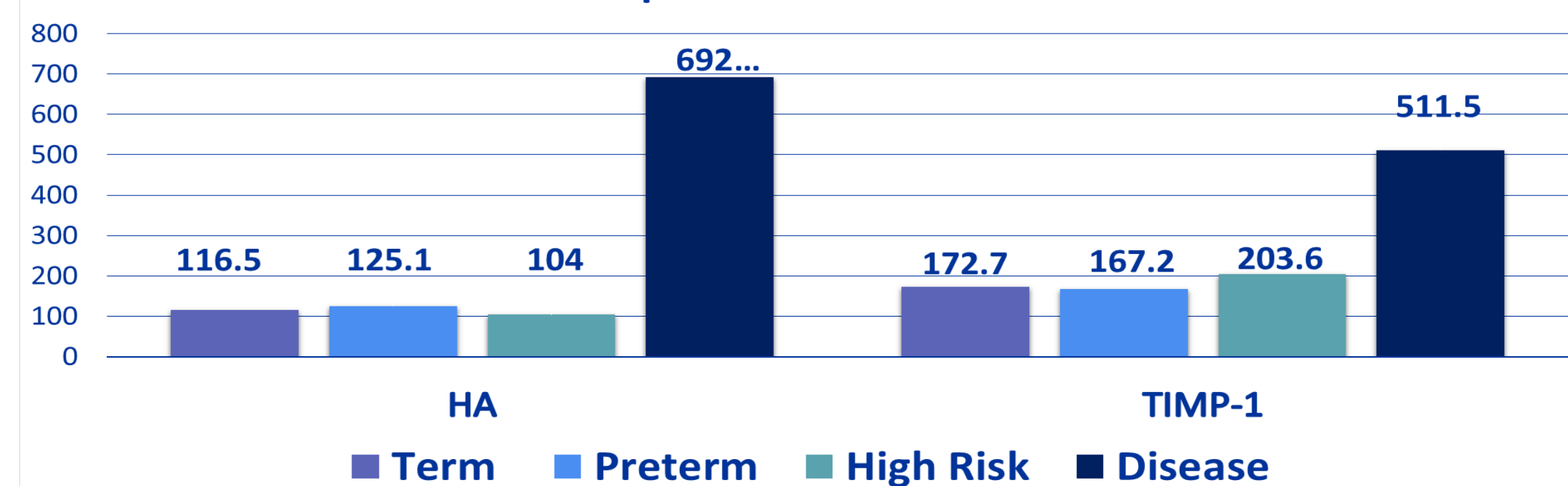
Population (n)	Hyaluronic Acid		TIMP-1		PIIINP	
	Mean	STD	Mean	STD	Mean	STD
1 (50)	117	39	173	52	1.6	0.9
2 (17)	125	39	167	71	2.1	1.3
3 (6)	104	55	204	87	0.9*	0.6

* Statistically significant against population 2

ELF Score Comparisons



Comparison with Disease



Conclusions

Term and preterm infants had similar HA, TIMP-1 and PIIINP concentrations at birth. ELF scores were also similar and appear to be higher compared to normative levels for children/adult populations. HA and TIMP-1, are significantly elevated in infants with PNALD compared to T, PT or HR infants. This is likely due to activation of hepatic stellate cells (HSC), the central event for liver fibrosis and promoted by TIMP-1, which increases HA.

Future Directions

Further analyses are underway to evaluate PIIINP levels and ELF scores in infants with PNALD. Novel markers of liver disease may provide insight into liver disease progression and facilitate for earlier treatment.

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