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BACKGROUND

- Non-alcoholic fatty liver disease (NAFLD) is the most common liver disease seen in the pediatric population
- It occurs in the setting of: insulin resistance and increased adiposity
- NAFLD can be:
 - Non-alcoholic fatty liver (NAFL): bland steatosis
 - Non-alcoholic steatohepatitis (NASH): steatosis and lobular inflammation and hepatocellular injury
- Fibrosis: indicate a more severe phenotype even in the absence of NASH
- Liver biopsy should be considered in children who have increased risk of NASH and/or advanced fibrosis (1B)
 - ↑ liver enzymes (ALT>80 U/L or AST/ALT>1)
 - splenomegaly
 - T2D
 - panhypopituitarism

OBJECTIVE

- To investigate NAFLD in youth with overweight and obesity

METHODS

- Retrospective analyses
 - Clinical
 - Laboratory
 - Imaging
 - Histological data
 - Underwent liver biopsy:
 - during bariatric surgery (n=22)
 - percutaneously (n=15)
 - Exclusion criteria: other causes of chronic liver diseases
 - Results: NASPGHAN criteria
 - Approved by the Institutional Ethic Committee and patient/parental consent was obtained
- Co-morbidities evaluated:
 - ↑ Liver enzymes
 - Splenomegaly
 - Hypertension: BP ≥ 130x80mmHg or use of anti-hypertensive drugs
 - Dysglycemia:
 - T2D: 2h-OGTT > 200 mg/dL
 - IGT: 140 < 2h OGTT < 200 mg/dL
 - IR: HOMA-IR ≥ 2.5
 - Dyslipidemia:
 - TC > 200 mg/dL
 - non-LDL-C > 135 mg/dL
 - HDL- C < 40 ♂
 - HDL- C < 45 ♀
 - TG > 130 mg/dL

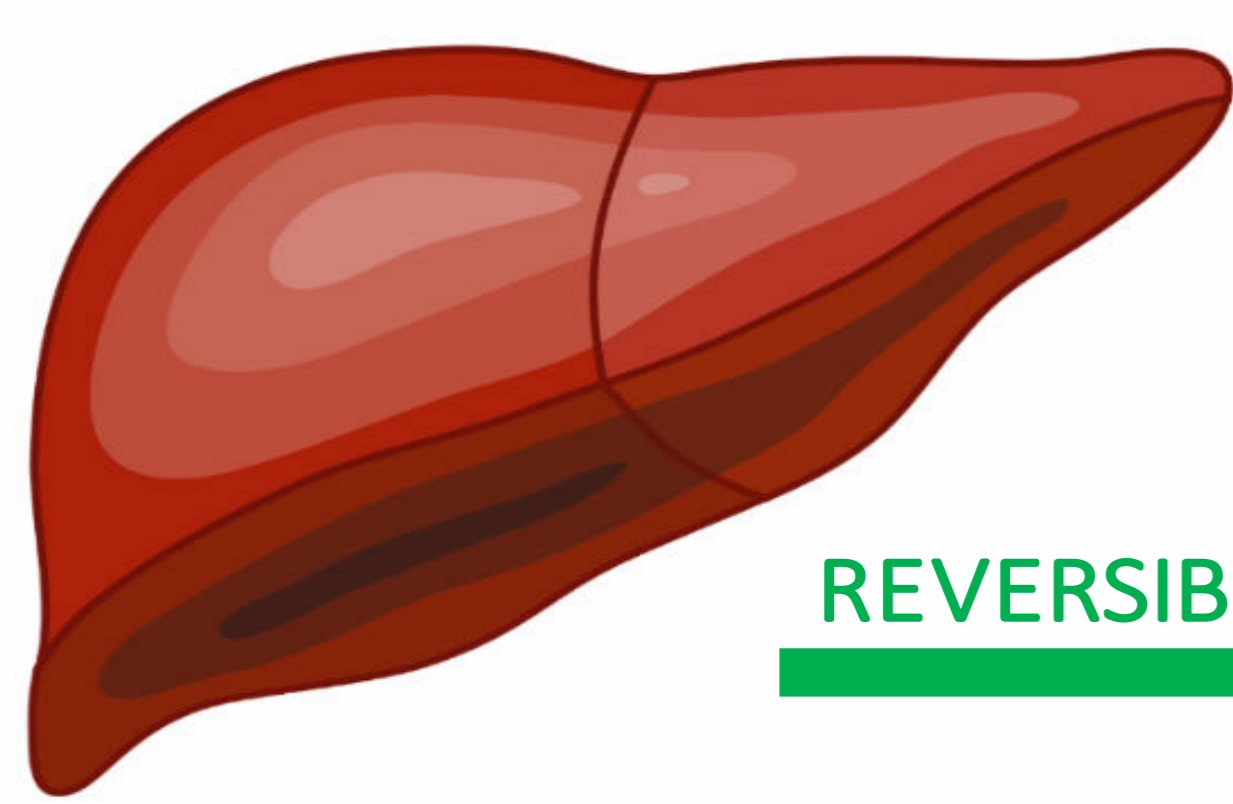
RESULTS

37 children and adolescents with overweight/obesity (2006-2017)

mean age: 15.8 years (7-21)
mean BMI: 39.3 kg/m²

0% splenomegaly
65% ♂

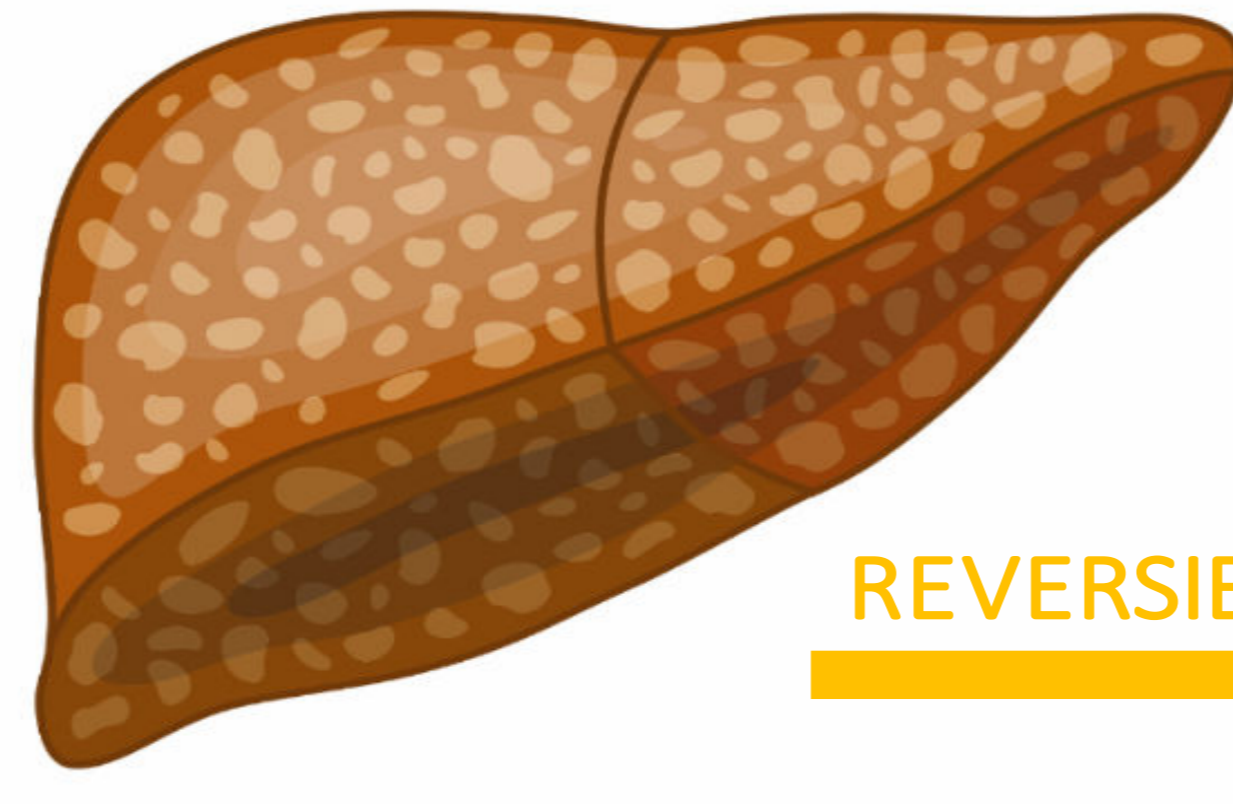
73% ultrasound with steatosis
100% Waist Circumference > p90



HEALTHY LIVER

11%
(4/37)

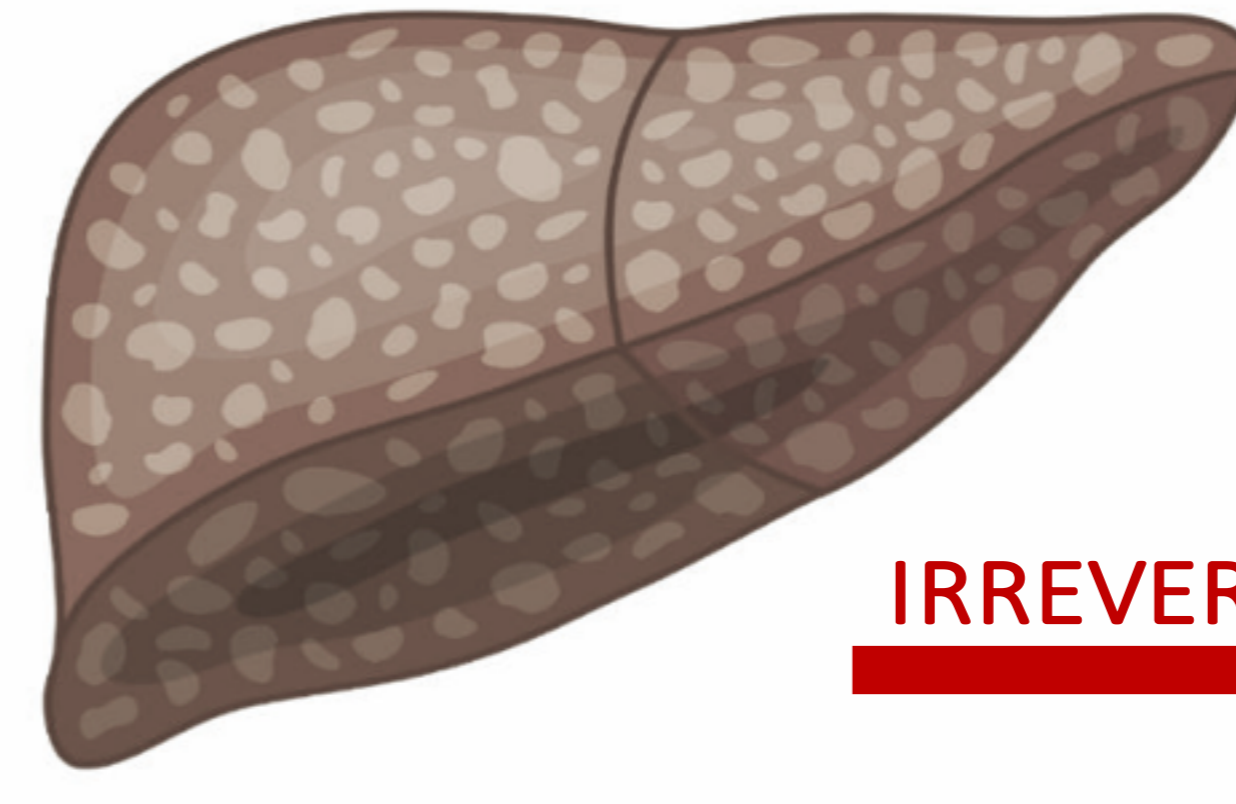
REVERSIBLE



Non-Alcoholic Fat Liver (NAFL)

89%
(33/37)

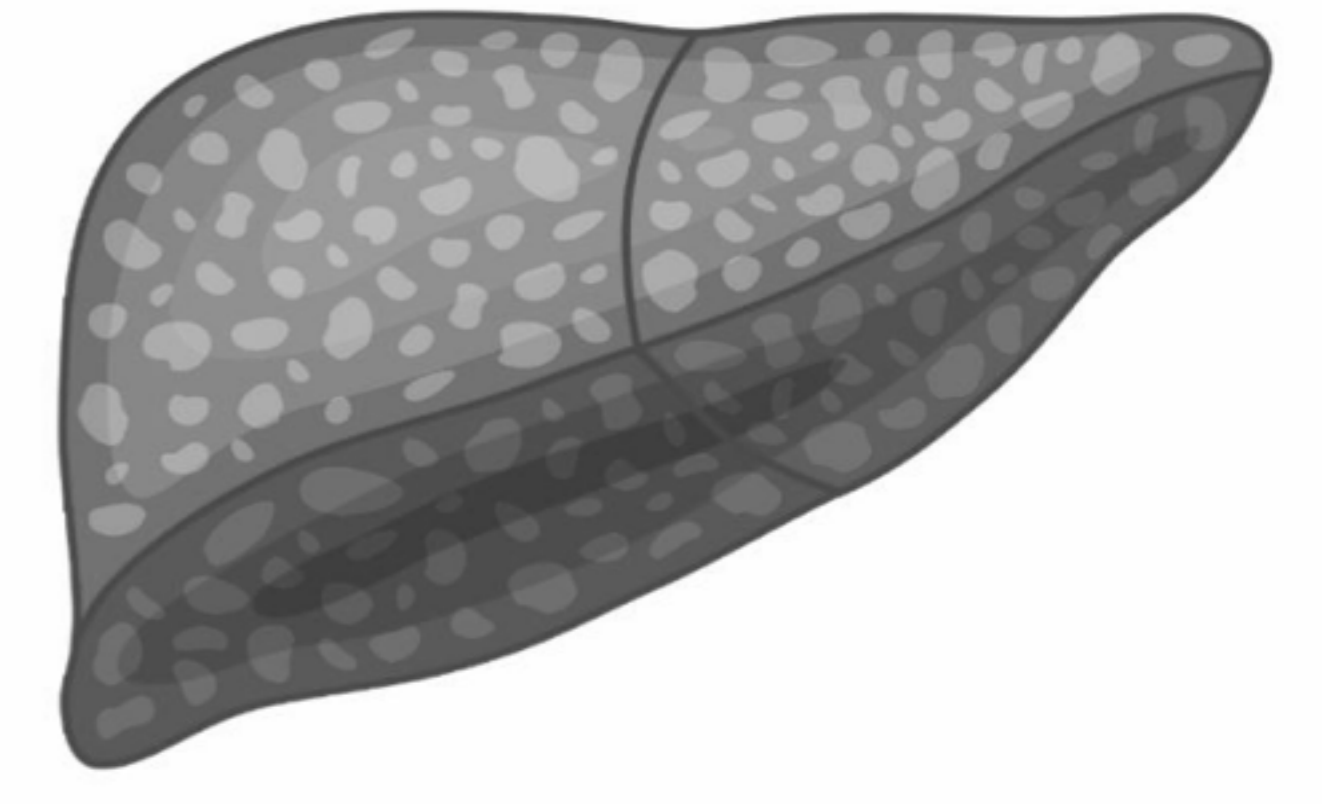
REVERSIBLE



Non-Alcoholic Steatohepatitis (NASH)

65%
(24/37)

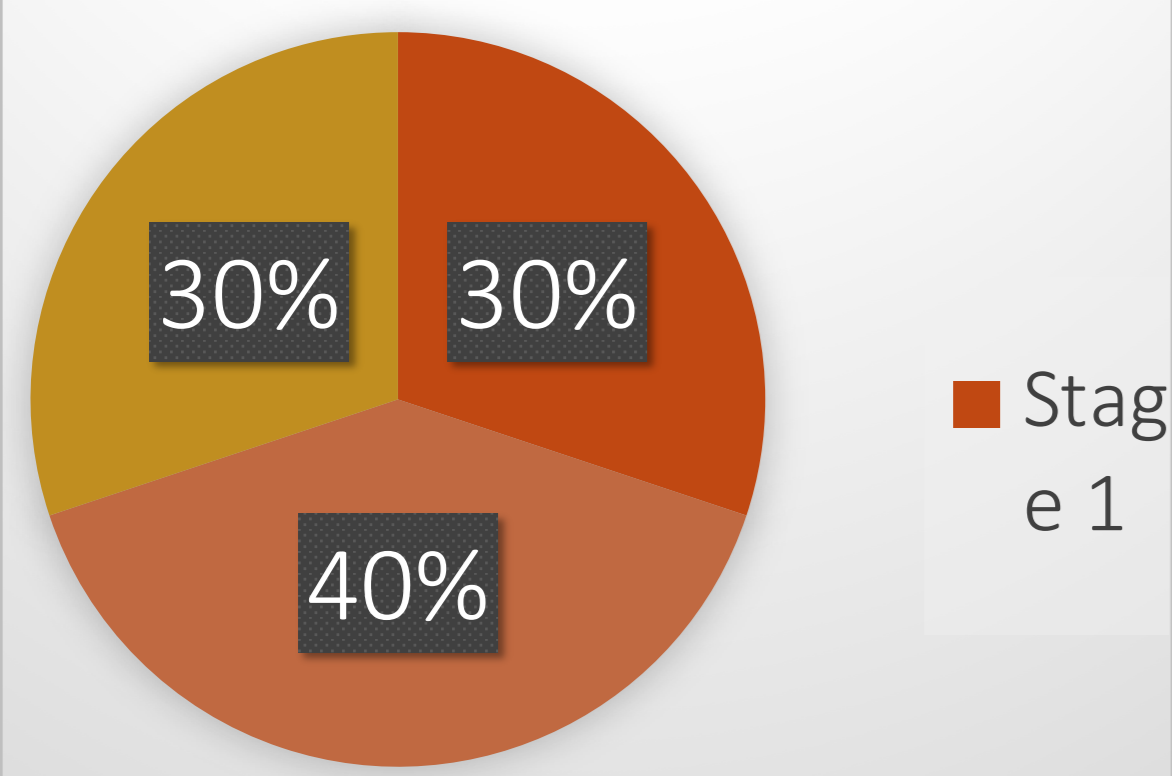
IRREVERSIBLE



CIRRHOSIS

0%
(0/37)

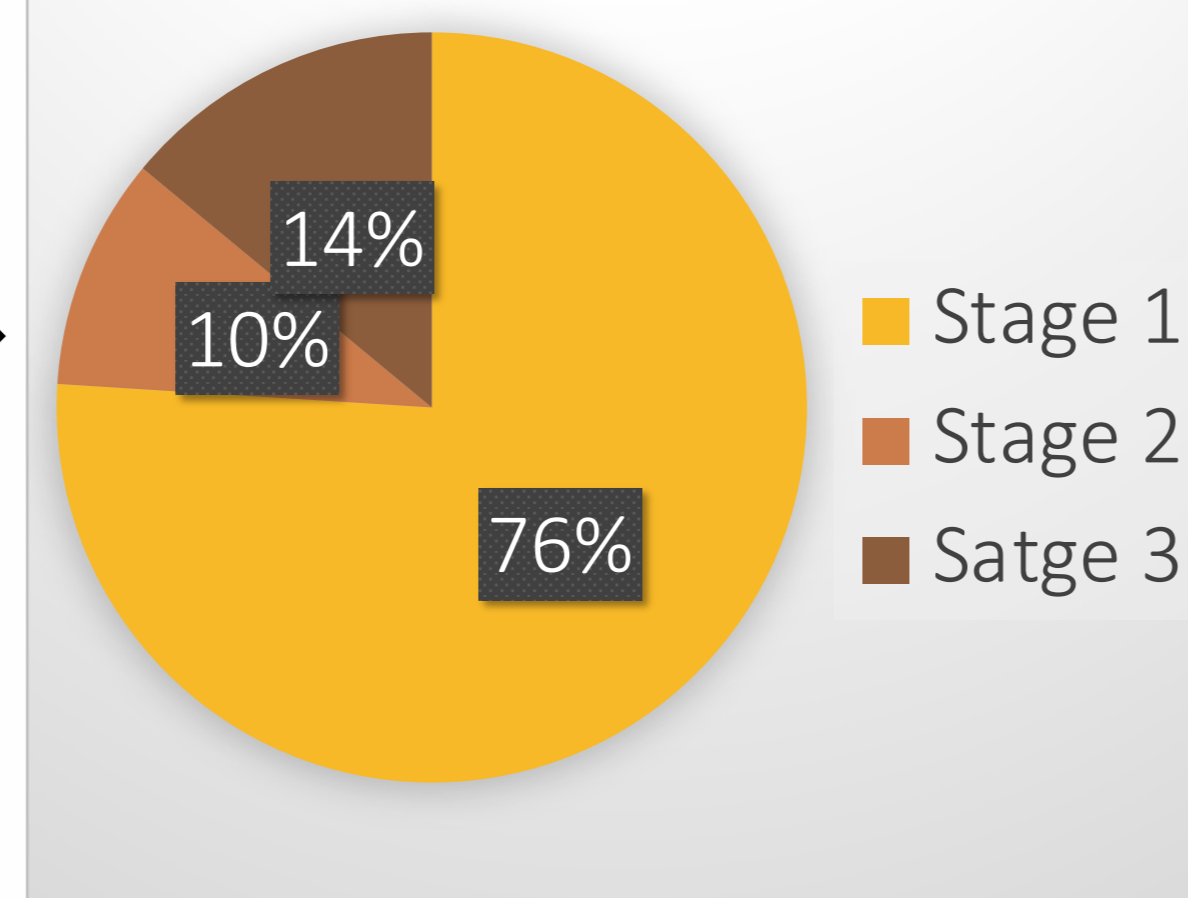
NAFL (STEATOSIS)



Stage 1

63.6% (21/33)

STEATOHEPATITIS

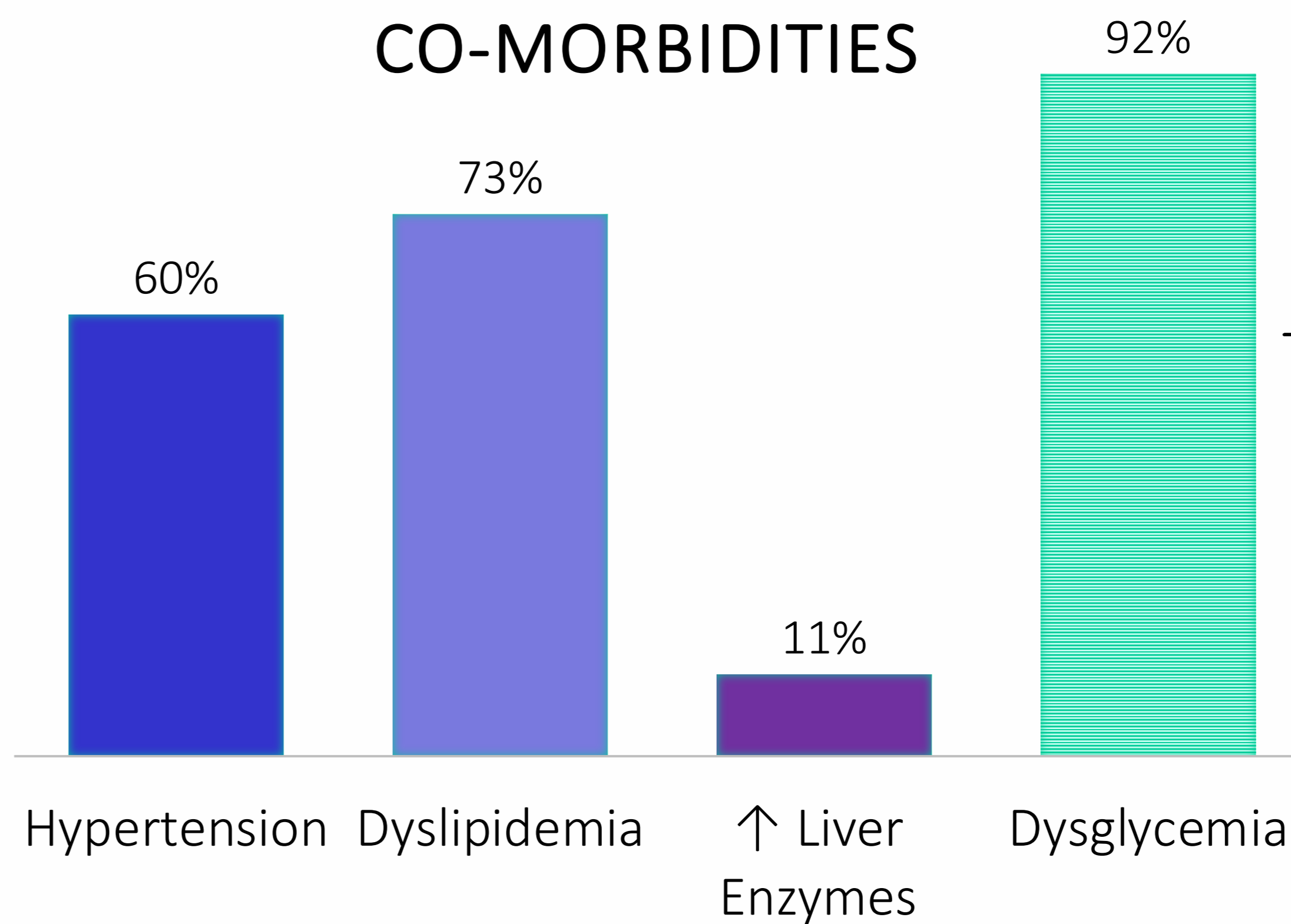


Stage 1
Stage 2
Stage 3

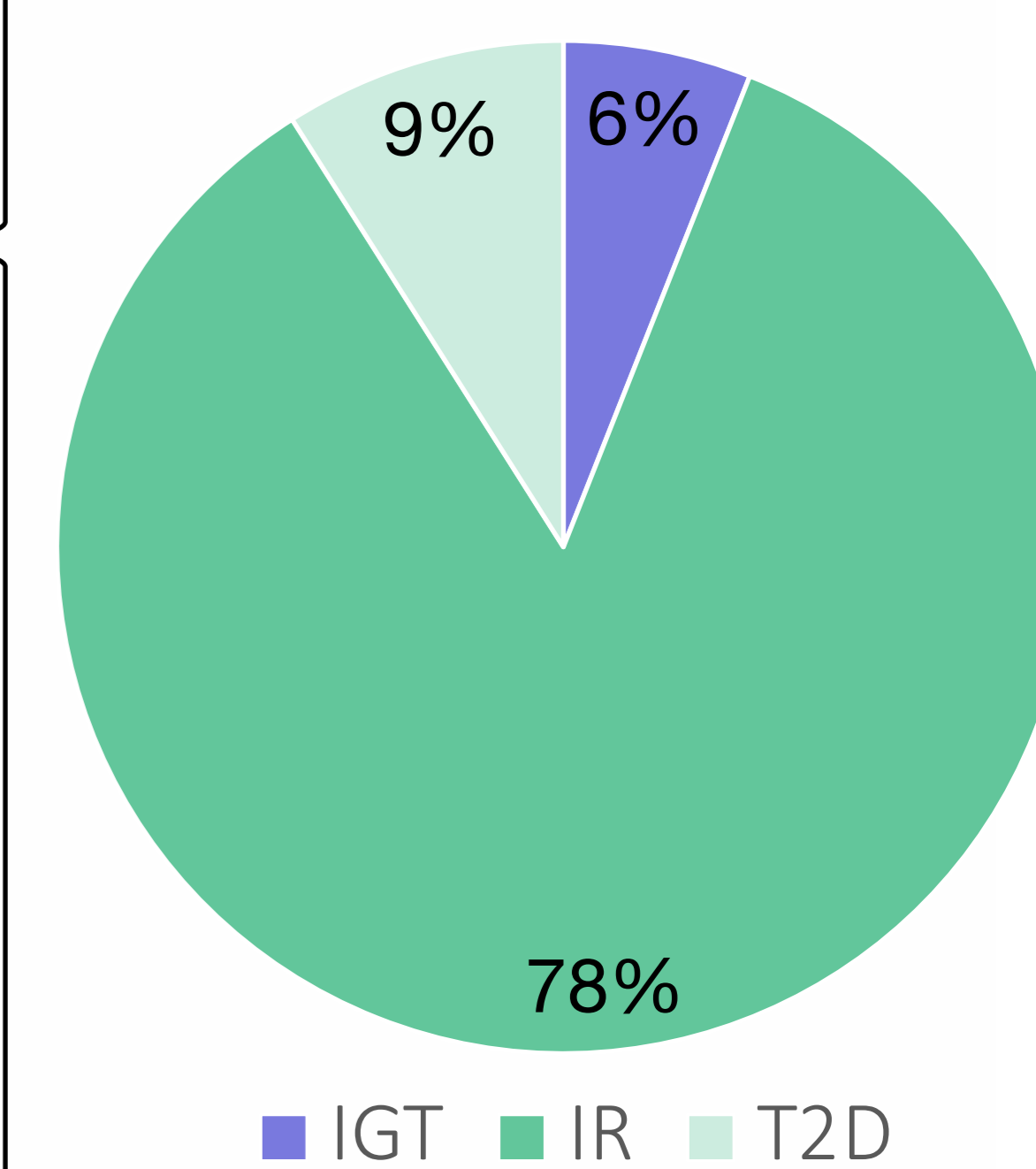
FIBROSIS

63.6%
(21/33)

CO-MORBIDITIES



DYSGLYCEMIA



CONCLUSION

- NAFLD was highly prevalent among youth with overweight/obesity
- Although NASH was diagnosed in 65%, if we were to use NASPGHAN criteria only 20% would have been recommended liver biopsy
- Since NAFLD can result in progressive fibrosis and lead to end-stage liver disease, other criteria should be considered for the early diagnosis in this population