Non Alcoholic Fatty Liver Disease and Pancreatic Size in Children

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Introduction

- Non Alcoholic Fatty Liver Disease (NAFLD) is the most common cause of chronic liver disease in children
- Associated with obesity and insulin resistance
- Pancreatic size is decreased in patients with type 1 and 2 diabetes
- Since NAFLD is associated with insulin resistance we hypothesize that pancreatic size in patients with NAFLD will be smaller than normal controls

Aims

- To determine whether pancreatic size in children with NAFLD is smaller compared to normal controls

Methods

- Retrospective chart review of patients aged 5-18 yrs who were referred for evaluation of NAFLD from February 2003 to August 2008
- NAFLD defined as sonographic appearance of increased echogenicity of the liver consistent with fat deposition in the absence of other known liver disease
- AP diameter of the head, body and tail of the pancreas was measured and compared with established controls
- 27 included 10 excluded
- 2 groups:
  -grp 1 - 9 pts aged 6-10yrs
  -grp 2 - 16 pts aged 11-16yrs

Results

- Ages ranged from 5-16yrs (median 11 yrs)
- There were 23 males (85%) and 4 females
- Mean ALT was 145 U/L (range 58-555 U/L)
- HOMA-IR was >3.16 in 7/17 pts (41%)
- Acanthosis nigricans was noted in 23/27 pts (85%)

- Grp 2, the mean AP diameter in centimeters of the pancreatic head, body and tail were significantly smaller than controls
- Grp 1, the mean AP diameter in centimeters of the pancreatic head, body and tail were not significantly different than controls

Conclusions

- Insulin resistance is associated with decreased pancreatic size in patients with Type 1 and 2 diabetes
- NAFLD is associated with insulin resistance in most patients
- Our results show that the diameters of the pancreatic head, body and tail are significantly decreased in a cohort of NAFLD patients aged 11-16 yrs compared to normal controls
- Significant differences were not seen in younger age groups
- Limitations are a small number of patients and a predominance of males
- Future studies including larger numbers of patients and comparison with obese controls are needed to validate these findings

References

1. SCHWIMMER J. DEFINITIVE DIAGNOSIS AND ASSESSMENT OF RISK FOR NON ALCOHOLIC FATTY LIVER DISEASE IN CHILDREN AND ADOLESCENTS. SEMIN LIVER DIS 2007; 27: 312-318
2. SAISHO Y, BUTLER AE, MEIER JJ, MONCHAMP T, ALENAUERBACH RA, RIZZA RA, BUTLER PC. PANCREAS VOLUMES IN HUMANS FROM BIRTH TO AGE ONE HUNDRED TAKING INTO ACCOUNT SEX, OBESITY, AND PRESENCE OF TYPE-2 DIABETES. CLINICAL ANATOMY, 2007, 20,:933-942