Does Liraglutide therapy affect the metabolic response in patients with elevated alanine aminotransferase and type 2 diabetes mellitus?: ABCD Nationwide Liraglutide Audit

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BACKGROUND

Liver disease is common in type 2 diabetes, mainly due to the high prevalence of non-alcoholic fatty liver disease (NAFLD). NAFLD can progress to non-alcoholic steatohepatitis (NASH) and cirrhosis, so it is important to diagnose.

Diagnosis can involve evaluation of clinical features, liver enzymes, imaging and liver biopsy. Several non-invasive scores have been devised given the drawbacks of biopsy, some of which include measuring alanine aminotransferase (ALT).

ABCD Nationwide Liraglutide Audit

This initiative was launched in 2009 and is ongoing collecting a core dataset (including ALT) on UK patients treated with liraglutide. Baseline characteristics (n=5643): 55.5±11.0yrs, diabetes duration 9.0(IQR6.0-13.0) years, weight 110.5±22.8kg, HbA1c 9.4±1.7%, BMI 38.8kg/m^2 vs combined clinical trial patients HbA1c 8.5%, BMI 31kg/m^2.

AIM

To evaluate the effect of:

1. Liraglutide on the metabolic response (HbA1c, weight, ALT) in patients with an elevated ALT
2. Variation in the baseline ALT on the metabolic response to liraglutide

METHOD

- Data was obtained from ABCD liraglutide audit (2009-2013).
- Selection:

Baseline ALT → Follow-up ALT ≥6 weeks, <1 year → Liraglutide cessation

- Patients categorised into 3 groups depending on baseline ALT
  - Normal ALT≤30U/l
  - Abnormal ALT 31-50U/l
  - High abnormal ALT >50U/l
- Descriptive statistics, before and after comparisons were performed.

RESULTS

Table 1. Baseline characteristics categorised by baseline ALT

n (%)	ALT ≤30 606 (55.5)	ALT 30-50 n314 (28.8)	ALT >50 N171 (15.7)	P-Value
Male (%)	49.3	58.3	70.8	<0.0001
Caucasian (%)	85.2	91.7	88.4	0.04
Age (yrs)	57.5±10.8	55.5±10.4	51.0±11.3	<0.0001
Diabetes Duration (yrs)	10(7.0-15.0)	9(6.0-13.0)	7(4.0-11.8)	<0.0001
On insulin (%)	44.7	44.6	32.2	0.01
HbA1c (%)	9.0±1.7	9.2±1.6	9.3±1.6	0.02
BMI (kg/m2)	38.3±7.3	38.8±8.3	37.6±6.1	0.25
Weight (kg)	108.5±23.1	111.2±23.4	110.8±21.6	0.19
ALT (U/l)	22(17.0-25.0)	39(34.0-44.3)	65(56.0-78.0)	n/a
Liraglutide stop (%)	21.8	19.1	19.9	0.61

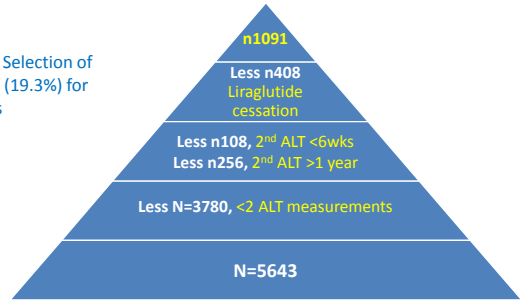

Fig. 1. Selection of n=1091 (19.3%) for analysis

Fig. 2. Clustered bar charts displaying baseline and follow-up A) mean HbA1c, B) mean weight, C) median ALT between the different ALT categories from left to right of ≤30, 30-50, >50U/l. Error bars indicate 1SE for means, 95% confidence interval for median.

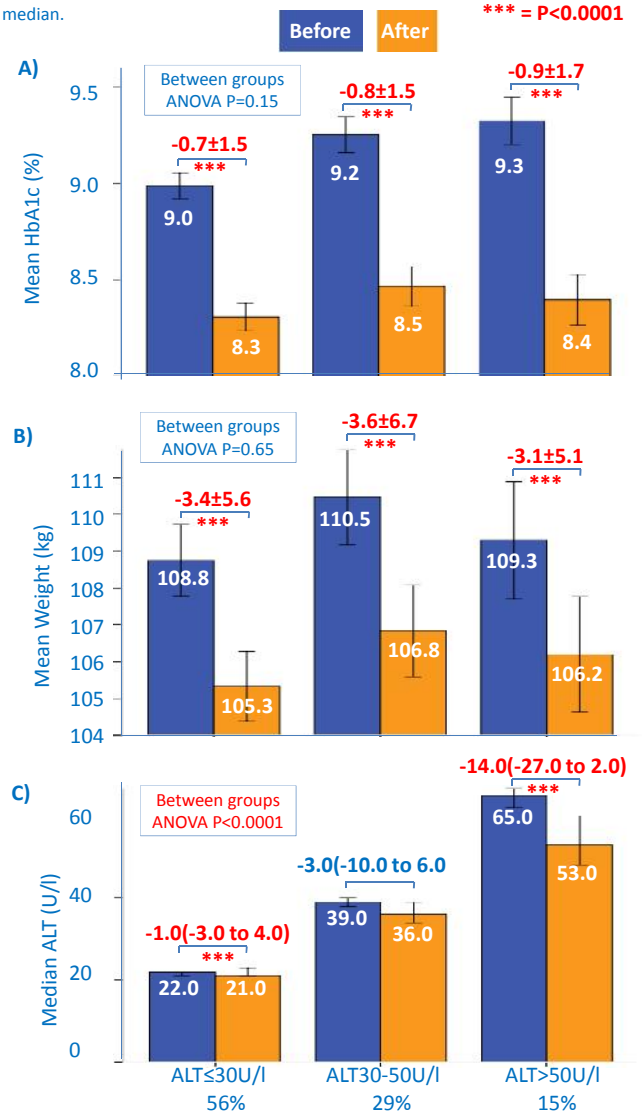

Table 2. Spearman Rank Correlations with metabolic response

Baseline ALT correlation with:	Spearman's Rank Correlation coefficient	P-value
Change in HbA1c	-0.05	0.09
Change in weight	0.02	0.53
Change in BMI	0.05	0.14
Change in ALT	-0.34	<0.0001

CONCLUSION

This analysis utilising serum ALT may have implications regarding NAFLD. There are marked differences observed in baseline characteristics in the high versus normal ALT group

Liraglutide reduces HbA1c and weight across all ALT groups suggesting that NAFLD does not moderate this response.

Liraglutide use has a significant impact on ALT reduction in patients with type 2 diabetes a high baseline ALT; there is an inverse correlation.

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