Aetiology of Asymptomatic Raised Serum Alanine Aminotransferase Level in Hospitalized Type 2 Diabetic Patients

Dr. Roksana Yasmin
Assistant Registrar
Department of Medicine
BIRDEM

Introduction

- Abnormal liver function test in routine blood examination is a common condition in general population
- Frequently overlooked and inadequately investigated
- May be an indicator of significant liver disease

Background

- NAFLD 34-70% in general population
- 50% are diabetic
- 76% are obese
- Among diabetic patients,90% are T2DM, majority are obese
- NAFLD → NASH → cirrhosis
- Related to uncontrolled blood glucose, insulin resistance and abnormal lipids
- In several studies- association between chronic hepatitis C infection and DM
- Raised ALT is often a marker for hepatitis B and C infection

Aims and objectives

- To see the prevalence of raised ALT in hospitalized T2DM patients
- To find out the aetiology of raised ALT in T2DM
- To see any correlation between raised ALT and BMI of patients
- To see any correlation between raised ALT and glycaemic control of patients
- To see any correlation between raised ALT and lipid level of patients

Materials and methods

- Study design: Cross-sectional observational study
- Study period: July 2011 – December 2011
- Study place: Department of Internal Medicine, BIRDEM General Hospital
- Study population: 53 (6.4% of total hospital admission of T2DM patients)

Inclusion criteria

- Hospitalized adult T2DM patient
- Having raised ALT
- Willing to be included in study

Exclusion criteria

- Having primary hepatic pathology like acute viral hepatitis or chronic liver disease
- Those in whom hepatic involvement is likely e.g. dengue syndrome
- Alcoholics and those who are not willing to be included in study

Results

- Total number of patients were 53, male 39, female 14 (M:F ratio 2.8:1)
- 6.4% hospitalized T2DM patient had raised ALT
- Mean age 49.2 ± 7.9 years
- Mean BMI was 25.5 ± 4.0 kg/m^2

Results

- 29 (55%) patients had hypertension
- Mean FBS 9.2 ± 5.7 mmol/L
- Mean HbA1C 9.7 ± 3.9 %
- Mean ALT was 123.82 ± 44.46 iu/L

Results

- Mean total cholesterol 196.25 ± 44.96 mg/dl
- Mean TG 187.96 ± 99.94 mg/dl
- Mean HDL 36.81 ± 8.22 mg/dl
- Mean LDL 125.81 ± 36.64 mg/dl

Distribution of patients according to ALT level

ALT	< 2 UNL	2-5 UNL	> 5 UNL
Number	7	41	5
%	13.2	77.4	9.4

Relation of raised ALT with BMI

BMI kg/m²	Number (%)	Mean ALT (IU/L)
< 18.5	0 (0%)	-
18.5-24.9	12 (22.6%)	96.62 ± 13.52
25-29.9	25 (47.2)	102. 53 ± 29. 37
≥ 30	16 (30.2)	129.86 ± 29.34

Relation of raised ALT with FBS

ALT	FBS mmol/L
< 2 UNL	8.2 ± 2.3
2-5 UNL	11.3 ± 3.4
>5 UNL	13.6 ± 5.8

Relation of raised ALT with HbA1C

ALT	HbA1C (%)
< 2 UNL	7.9 ± 1.8
2-5 UNL	8.4 ± 2.9
> 5 UNL	10.2 ± 3.7

Relation of raised ALT with TG

ALT	TG (mg/dl)
< 2 UNL	154.33 ± 47.54
2-5 UNL	159.76 ± 67. 76
> 5 UNL	189. 23 ± 75.32

Distribution of patients according to aetiology of raised ALT

Aetiology	Number	%
NAFLD	37	69.8
Hepatitis B infection	7	13.2
Hepatitis C infection	5	9.4
Others	4	7.5

Association of raised ALT with fatty liver

USG	ALT < 2 UNL	2-5 UNL	> 5 UNL
Fatty liver	1	35	1
Normal	6	6	4

Limitations of the study

- Study population was small
- Short study period
- Fibro-scan and liver biopsy was not done routinely (fatty liver was diagnosed by USG only)

Conclusion

- Fatty liver is the commonest cause
- If ALT rise is >5 times, serious pathology is likely
- Elevated level of ALT has positive relation with BMI, glycaemic status and dyslipidaemia

Thank you all