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METABOLIC DYSFUNCTION- ASSOCIATED STEATOTIC LIVER DISEASE IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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INTRODUCTION

Metabolic dysfunction-associated steatotic liver disease (MAFLD) is increasingly recognized as a major health concern. Few studies examined the frequency of MAFLD in childhood acute lymphoblastic leukemia (ALL).

AIM

To identify the frequency and associated characteristics of MAFLD in children with ALL at various phases of treatment.

METHODS

60 children with ALL Received the total XV therapy protocol

20 newly diagnosed | 20 in continuation phase | 20 early post-completion of therapy

- 24-hour dietary recall
- Body composition analysis
- Liver function tests
- Lipid profile
- Abdominal ultrasound

Follow up at the end of induction

RESULTS

The mean age of the studied patients was 8.9 years with male-to-female ratio of 2:1. The frequency of MAFLD increased from 7 (35%) patients at diagnosis to 56% at the end of induction, while 10% of patients during the continuation phase and 25% post-completion of therapy had MAFLD (Table 1).

Table 1: Comparison of MAFLD and its grading among Patients pre and post induction

Variable	Pre-induction N = 20	Post-induction N = 16	P- value
Abdominal US grading, n (%)			
Grade 0	13 (65)	7 (43.8)	0.293
Grade 1	7 (35)	8 (50.0)	
Grade 2	0 (0)	1 (6.3)	
Lost follow up	0 (0.0)	4(20.0)	
Non-MAFLD, n (%)	13 (65)	7 (43.8)	0.048
MAFLD, n (%)	7 (35)	9 (56 %)	
MAFLD de novo	0 (0)	4 (25)	
MAFLD established	7 (35)	5(31)	
Total	20 (100.0)	16 (100.0)	

Among all the studied groups, MAFLD patients had higher median total daily caloric consumption (3272 kcal/d versus 1834 kcal/d, *p*=0.021), higher median fat intake (87 g/d versus 49 g/d, *p*=0.046), higher median carbohydrate intake (486 g/d versus 274 g/d, *p*=0.016) and higher median fructose containing beverages (2 per month versus 0 per month, *p*=0.041). (Figure 1)

Additionally, MAFLD group showed higher median triceps skin fold thickness z-score of 0.09 versus -0.51 in non-MAFLD group, *p*=0.002. However, body composition parameters were comparable between both groups.

In all treatment phases, MAFLD+ and non-MAFLD patients had comparable results of median serum ALT (*p*=0.588) and AST levels (*p*=0.612). The most important factors associated with MAFLD+ were hepatomegaly [OR (95% CI) of 16.559 (2.581-106.240), *p*=0.003], followed by fat intake > 68.12 g/d with [OR (95% CI) of 12.759 (1.741– 93.487) *p*=0.012], followed by abnormal LDL [OR (95% CI) of 9.703 (1.395– 67.470) *p*=0.022].

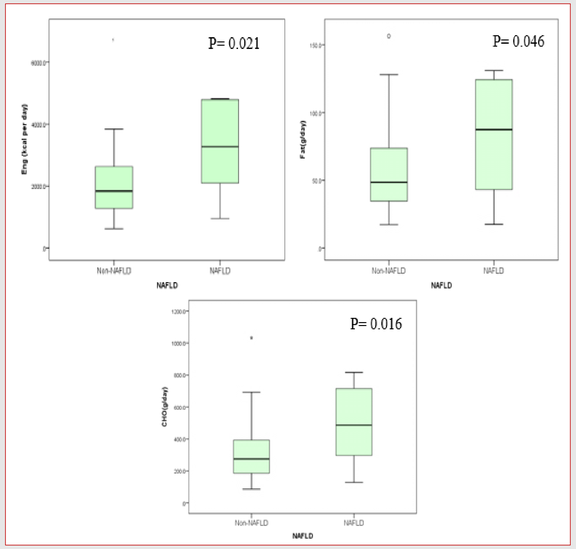


Figure 1: Comparison of energy, fat and carbohydrate levels among patients with and without NAFLD in all cases

CONCLUSIONS

MAFLD is a relatively common in childhood ALL especially in the post-induction phase and is associated with higher caloric intake especially of fat. These findings necessitate early implementation of nutritional programs during ALL treatment.

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