When to Intervene?
Onset and Timing of Obesity-related Metabolic Derangements After Liver Transplant

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INTRODUCTION

- **Orthotopic liver transplantation (OLT)** is the standard therapy for end-stage liver disease. **Cardiovascular events** are a common cause of death in post-OLT patients.
- The development of metabolic derangement post-transplant **increases the risk of cardiovascular events**.
- Understanding the **magnitude** and **timing** of metabolic derangements can help better define the timing of interventions.

STUDY AIM

- To characterize the temporal relationship of **weight gain** and **metabolic derangements** in the **post-OLT population.**

METHODS

- Retrospective analysis of patients status post-OLT from 2013-2021.
- We compared changes in **weight** and **Hemoglobin A1c (HbA1c)** from the time of transplant to 6 months (+/- 3 months), and yearly up to year 4 (+/- 3 months).

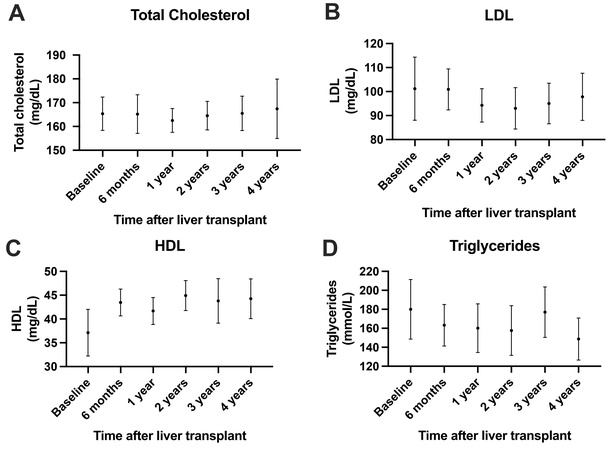

Figure 3. Lipid values for baseline up to 4 years post-OLT. A) Total cholesterol, B) LDL, C) HDL, and D) triglycerides. Mean + 95% CI.

RESULTS

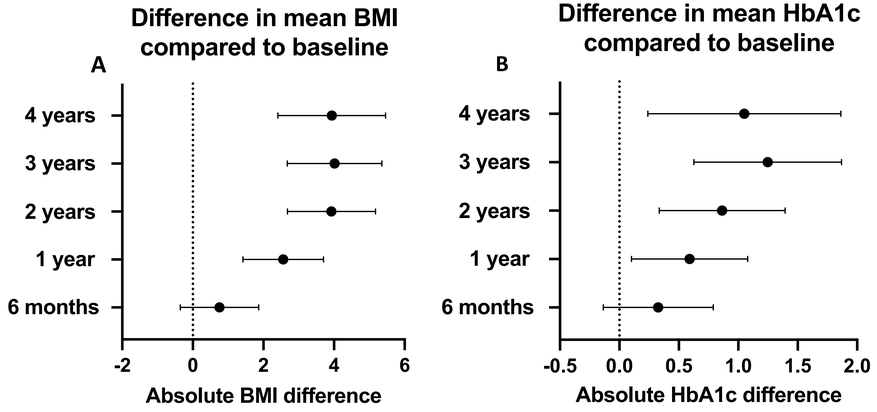

Figure 1. Change in BMI and HbA1c from baseline to 4 years post-OLT. Graph **A)** and **B)** show the absolute difference in mean as compared to baseline for BMI and HbA1c, respectively. Mean + 95% CI.

Time post-OLT	N	Mean (SD)	Mean diff. from baseline (95% CI)	p-value
Baseline	265	25.64 (4.82)	-	-
6 months	246	26.40 (4.46)	0.76 (-0.36 – 1.87)	0.313
1 year	232	28.20 (4.94)	2.56 (1.42 – 3.70)	<0.0001
2 years	171	29.57 (5.25)	3.93 (2.68 – 5.17)	<0.0001
3 years	136	29.65 (5.71)	4.02 (2.68 – 5.35)	<0.0001
4 years	95	29.58 (5.45)	3.94 (2.41 – 5.46)	<0.0001

Table 1. Descriptive data and statistical analysis comparing mean BMI at different time points post-OLT.

Time post-OLT	N	Mean (SD)	Mean diff. from baseline (95% CI)	p-value
Baseline	99	5.46 (0.98)	-	-
6 months	81	5.79 (1.35)	0.33 (-0.14 – 0.79)	0.282
1 year	67	6.05 (1.20)	0.59 (0.10 – 1.08)	0.0104
2 years	52	6.33 (1.19)	0.86 (0.33 – 1.39)	0.0002
3 years	33	6.71 (1.50)	1.25 (0.63 – 1.87)	<0.0001
4 years	17	6.51 (1.12)	1.05 (0.24 – 1.86)	0.0049

Table 2. Descriptive data and statistical analysis comparing mean HbA1c at different time points post-OLT.

- A total of 265 patients were included in the analysis.
- **Mean BMI** at baseline was 25.64 with a **statistically significant change** at 1, 2, 3 and 4 years, but not at 6 months (Fig 1a, Table 1).
- 164/251 (65%), 177/227 (78%), 137/166 (83%) had significant weight gain at 6 months, 1 year and 2 years respectively.
- **Mean HbA1c** at baseline was 5.5% with a **statistically significant change at 1, 2, 3 and 4 years but not at 6 months** (Fig 1b, Table 2).
- There was **a positive correlation between HbA1c and BMI** between baseline through year 2 (r=0.9812, p=0.0188) (Fig 2).
- There were no significant changes in cholesterol, LDL, HDL and triglycerides levels from baseline to year 4 post-OLT (Fig 3).

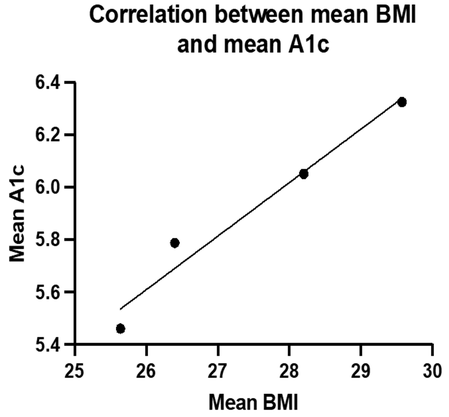

Figure 2. Correlation mean BMI and mean HbA1c. Pearson correlation r=0.9812 with p-value of 0.0188.

CONCLUSION & DISCUSSION

- There was a **prominent and statistically significant increase in BMI and HbA1c beginning at 1 year post liver transplant.**
- Our data suggest that targeted interventions to prevent obesity-related complications in this population should begin **at or before 1 year post-OLT.**