

# PLASMA FATTY ACIDS ALTERATIONS IN CHILDREN WITH ACUTE LYMPHOBLASTIC LEUKEMIA

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## Introduction

Acute Lymphoblastic Leukemia (ALL) is the most common malignancy of childhood with an annual incidence of 3-4 / 100,000 children <15 years.

Despite advances in treatment, pathogenesis, and cytogenetics/immunohistochemistry of the disease, around 20% of patients relapse.

Recent data on the metabolic reprogramming of cancer cells offer new perspectives on the research for prognostic / diagnostic biomarkers, and potential therapeutic targets.

Lipidomics has lately been identified as a promising cancer biomarker.

## Aim

The aim of the study was to measure the levels of fatty acids in the blood of patients with ALL and follow their potential alterations after the beginning of their treatment.

Determination of fatty acid levels (total, saturated, unsaturated, monounsaturated, polyunsaturated) by Gas Chromatography / Mass Spectrometry was performed.

Comparisons were focused on potential differences of fatty acid levels between patients (Day 0 and Day 33) and healthy controls, and also between the patients' group during the course of their treatment (day 0 and 33).

The statistical analysis was performed with SPSS v.25 by parametric and non-parametric tests.

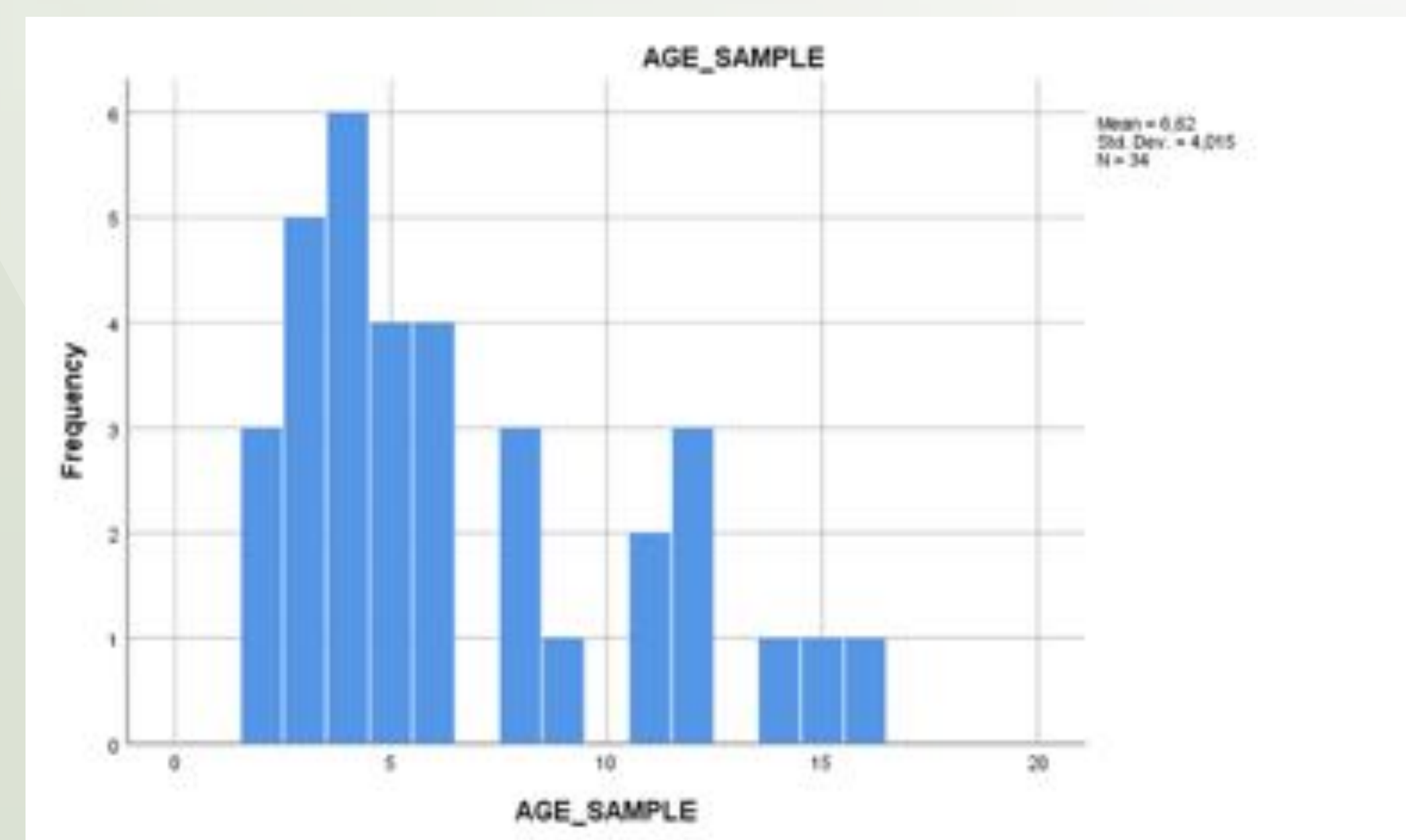


Figure 1: Age distribution of the sample

## Results

The levels of most fatty acids (FAs) measured were significantly altered, some augmented and some diminished, in patients (diagnosis) compared to controls (Fig.2) (mean omega3 / omega6 20.41 and 12.07 respectively, p: 0.011).

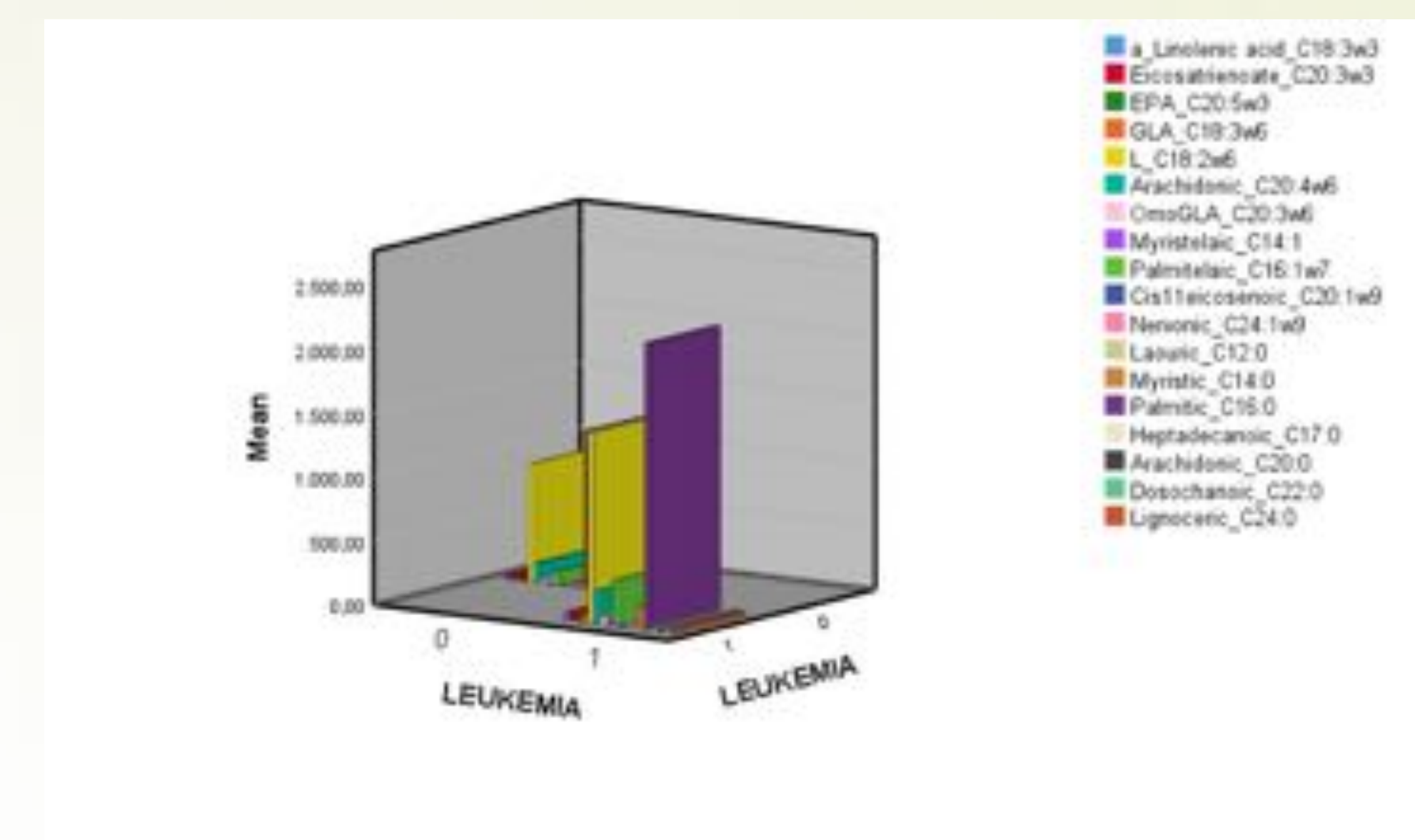


Figure 2: Significant alteration of FA between groups and controls

Levels of almost all FAs showed a statistically significant increase on day 33 of treatment, most markedly seen on levels of polyunsaturated omega3 and omega6 (Mean of total polyunsaturated FAs levels ( $\mu\text{mol} / \text{L}$ ): 2049 (patients day 0), 4071 (patients day 33) and 2622 (controls) - p <0.05) (Figure 3).

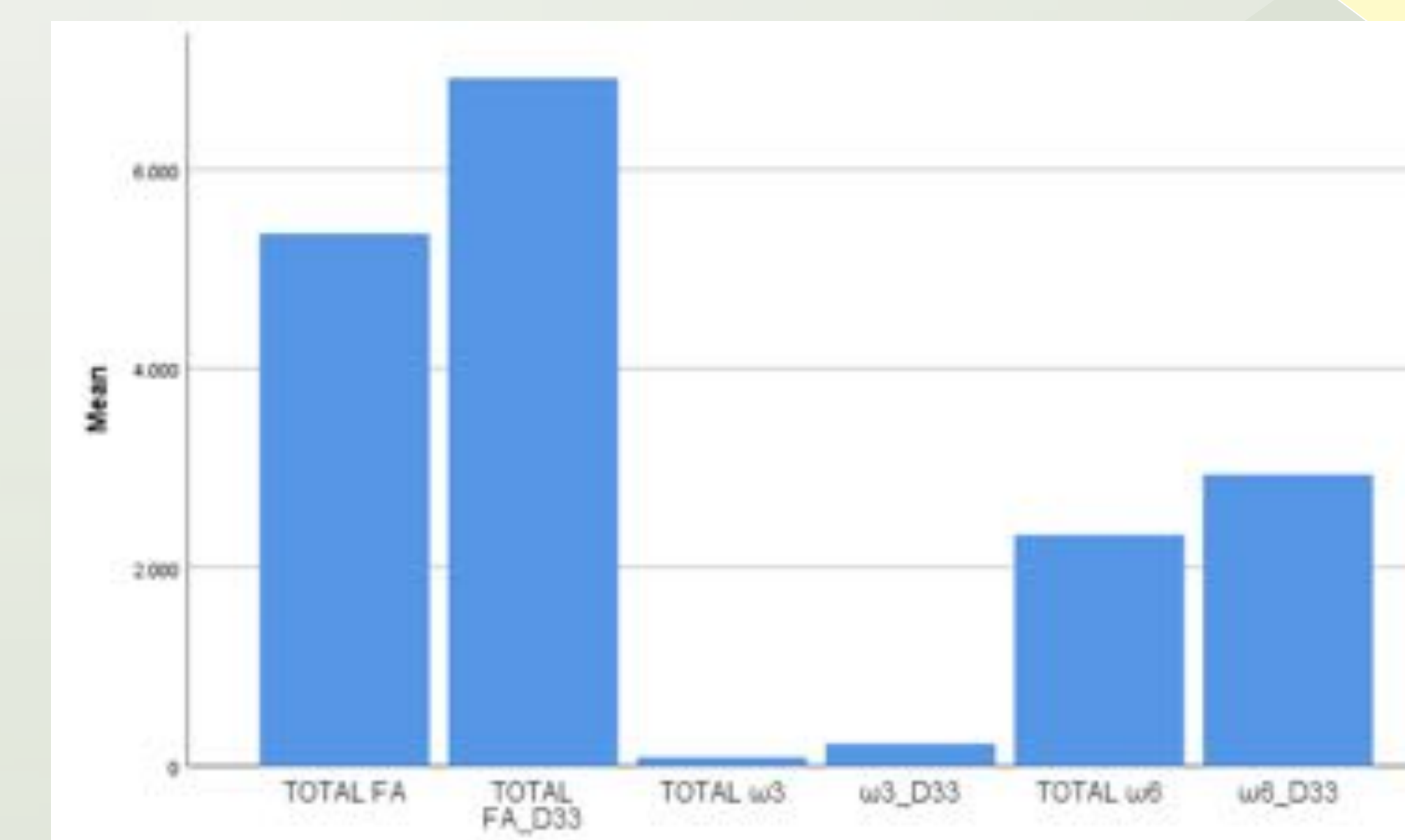


Figure 3: Means of total FAs, omega 3 and omega 6 in patients' plasma on D0 and D33 of their treatment course,

## Conclusions

- The above results are part of a study focusing on the metabolomic profile of paediatric ALL.
- These preliminary results support the implication of FA metabolism alteration in the pathogenesis of ALL.
- The hypotheses of a possible endogenous disorder of their composition and metabolism during the progression of the disease needs further validation.
- Further studies are needed that may also allow clinical-biochemical correlations.

## References

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**Lipidomics: a promising cancer biomarker**

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## Materials and Methods

Plasma of 17 patients diagnosed with ALL (2-16 years, 59% boys) (treatment day: 0 and 33) and an equal number of controls of corresponding age and sex were collected.