

Initial low fat reserves are associated with severe decrease in lean body mass in the first 30 months on extracorporeal dialysis therapy

Daniele Marcelli, Katharina Brand, Aileen Grassmann, Laura Scatizzi, Inga Bayh, Bernard Canaud

Fresenius Medical Care, Bad Homburg, Germany

Introduction

In patients with advanced chronic kidney disease, multiple metabolic and nutritional derangements are present as kidney disease progresses. With the initiation of dialysis, increased appetite may not compensate for the protein catabolism induced by dialysis as well as dialysis-associated nutrient losses.

The aim of this study was to evaluate the development of lean tissue index (LTI) and fat tissue index (FTI) during the first 30 months of hemodialysis (HD) treatment.

Methods

8227 incident adult HD patients who underwent evaluation of their body composition during the first 6 months of HD were considered. Patients with BMI < 18.5 kg/m², metastatic solid tumors, treated with catheter, or receiving less/more than 3 treatments per week after 6 months of renal replacement therapy initiation (baseline) were excluded.

LTI and FTI were evaluated using the BCM® (FMC, Bad Homburg, Germany), which is based on multifrequency bioimpedance spectroscopy at 50 different frequencies ranging between 5 and 1000 kHz.

Descriptive analysis was performed comparing the current value with the baseline value in each time interval (delta analysis). Linear mixed models considering the correlation structure of the repeated measurements were used to evaluate factors associated with different trends in LTI and FTI.

Results

During the first 24 months of HD, LTI decreased by about 1.3 kg/m² in patients with baseline FTI below the 10th percentile of the normal population. In patients with normal or high baseline FTI, LTI decreased slightly by 0.3 kg/m² or remained stable, respectively. In parallel, FTI increased by about 2 kg/m² in patients with low baseline FTI, by about 1 kg/m² in patients with normal baseline FTI, and remained stable in the obese patients. With the mixed models, a significantly higher decrease in LTI and increase in FTI was observed for patients with low baseline FTI compared to patients with normal and high baseline FTI.

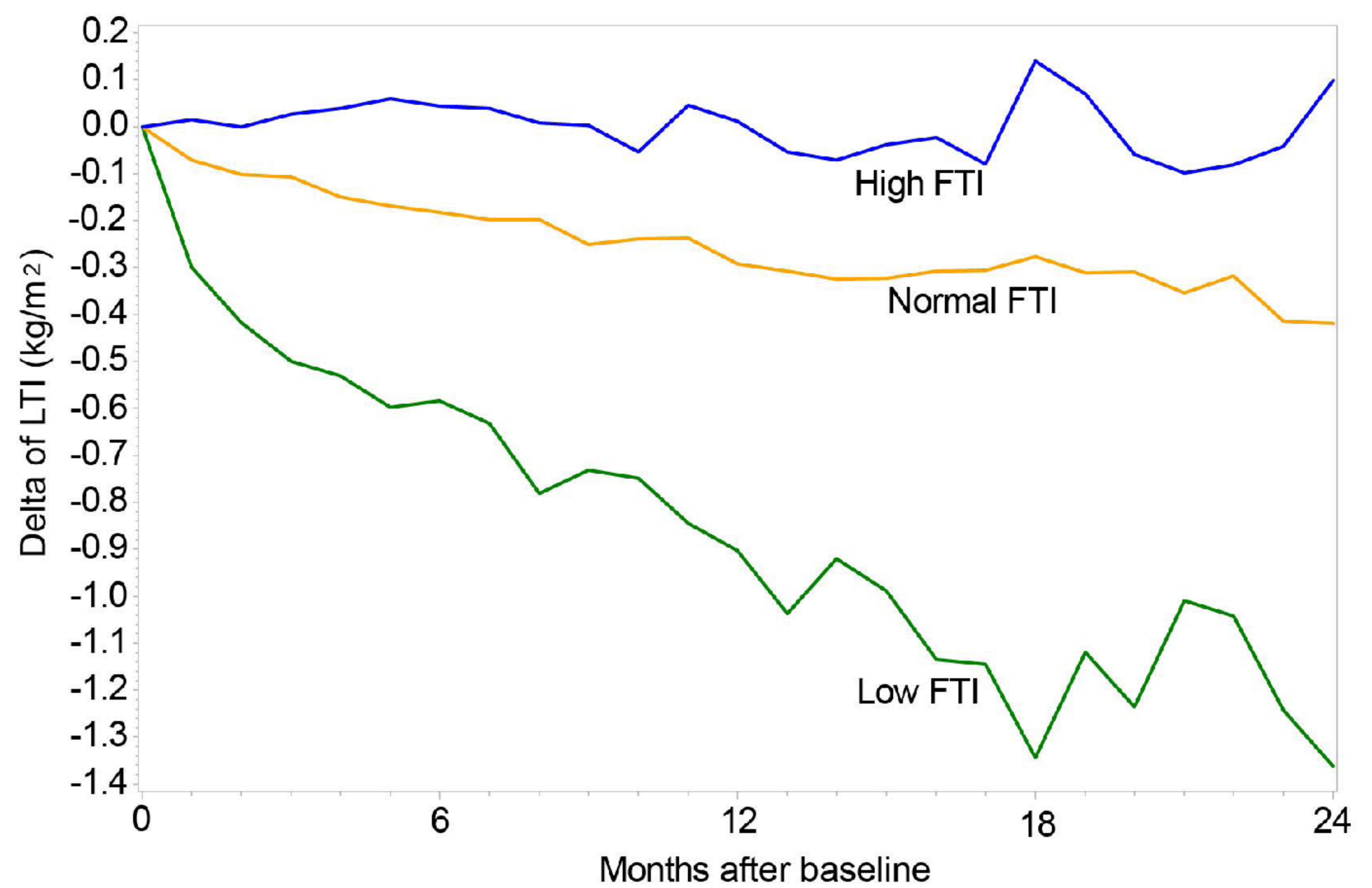


Figure 1. Delta analysis of LTI. Delta = current LTI – LTI at baseline

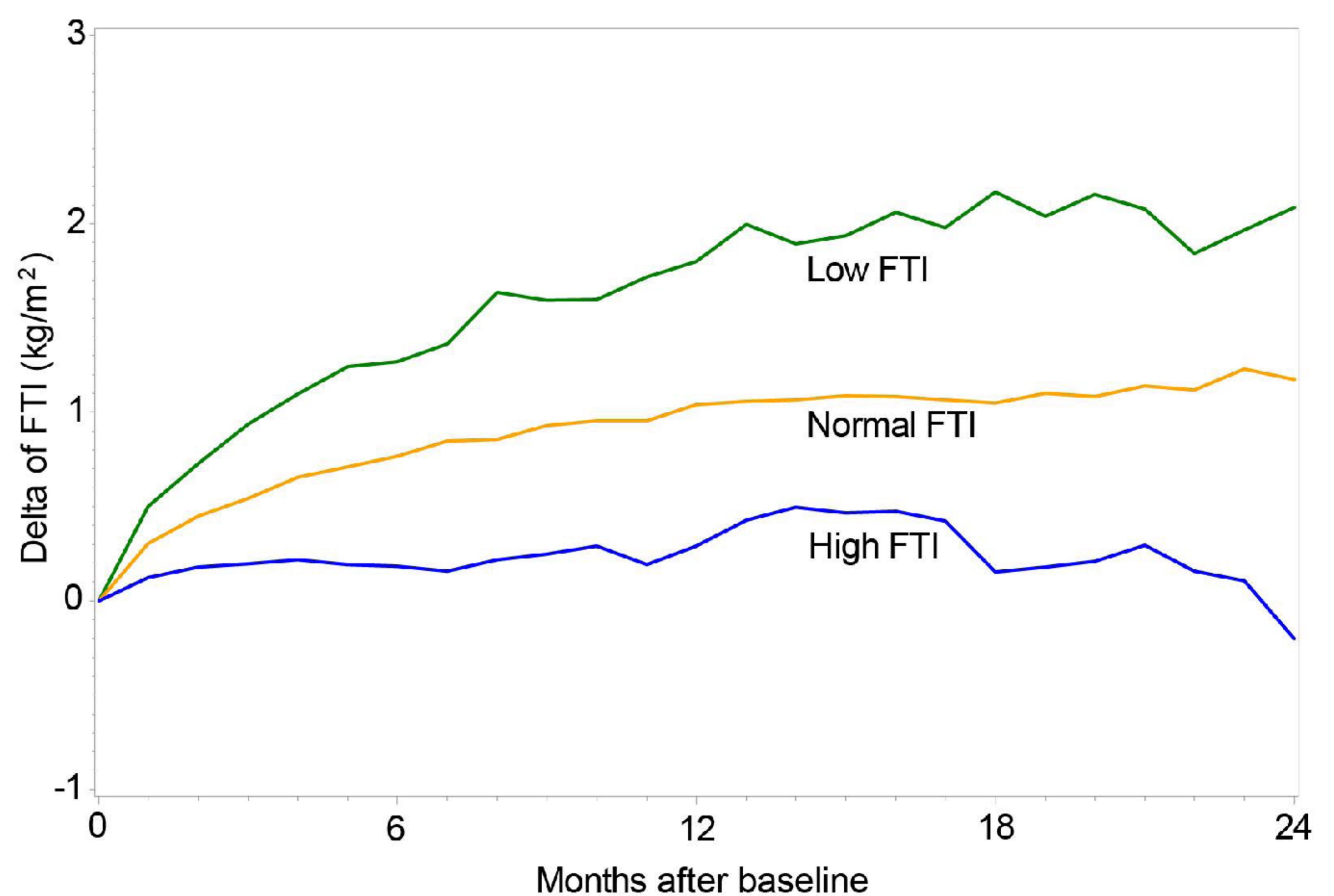


Figure 2. Delta analysis of FTI. Delta = current FTI – FTI at baseline

Conclusions

With the transition to dialysis, there is an accelerated loss of LTI and an increase in FTI after the first 6 months, mainly in patients with low baseline fat reserve. This may contribute to the development of protein-energy wasting. Pre-dialysis patient management should focus more on nutritional aspects in order to prepare patients better for the challenge of hemodialysis.

