Changes in body weight and serum liver tests associated with parenteral- versus no parenteral nutrition in acute myeloid leukemia patients during remission induction treatment

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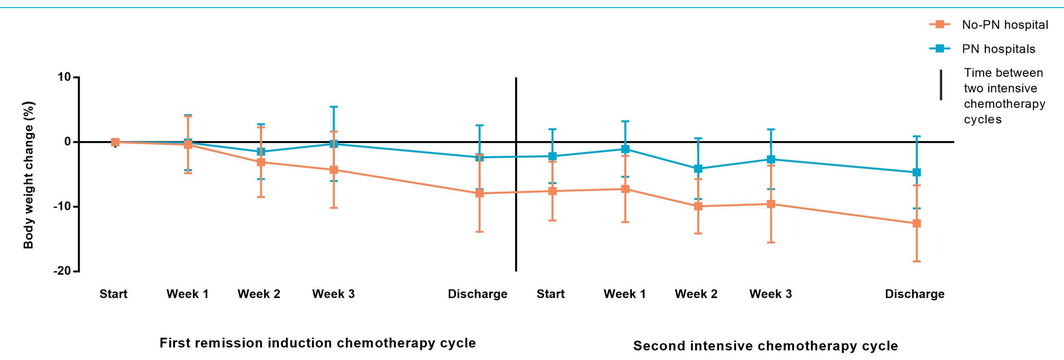
Introduction

There is ongoing controversy regarding the use of parenteral nutrition (PN) as a preventive measure for malnutrition in patients with acute myeloid leukemia (AML) during remission induction (RI) treatment due to fear of PN-associated complications, including liver dysfunction. The aim of this study was to assess differences in body weight changes and serum liver tests (LTs) in AML patients receiving PN versus no PN during RI treatment.

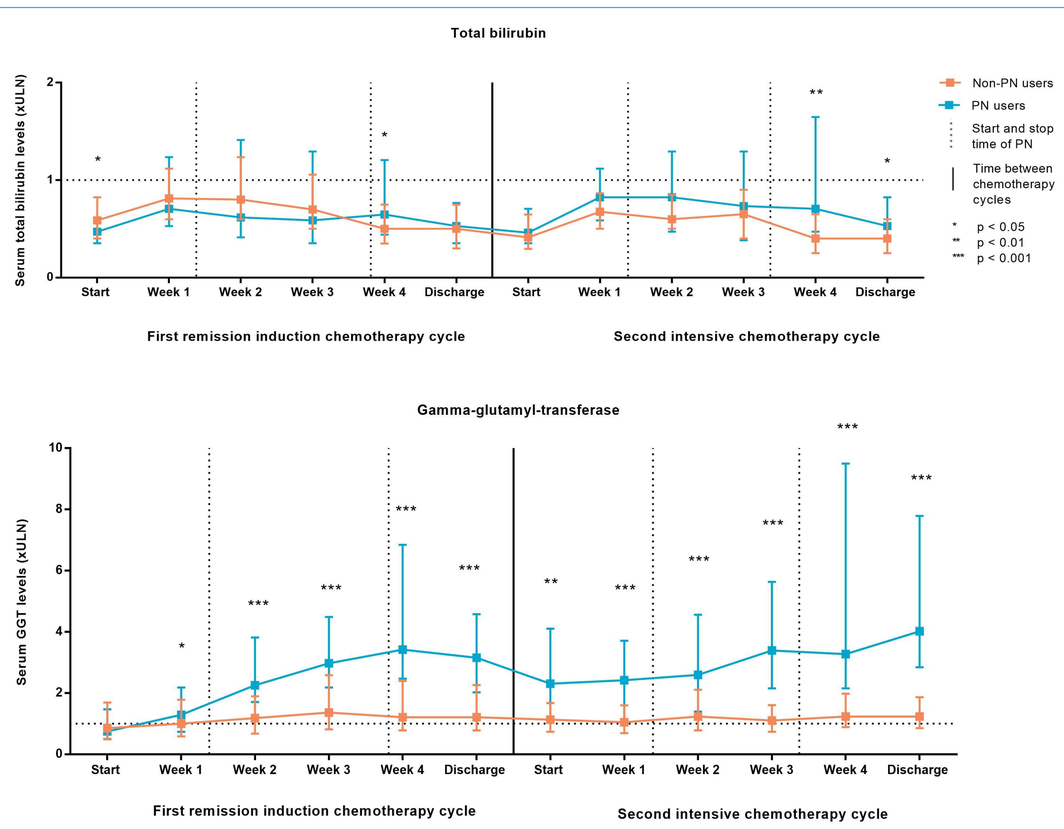
Methods

- Multicenter retrospective cohort study.
- Adult AML patients (n=213) who received RI treatment between 2004-2015 in one of three collaborating Dutch hospitals with similar patient populations were included.
- Differences in patients' body weight changes during RI treatment between the hospitals that apply PN upon the first indication of inadequate oral intake (PN hospitals) versus the hospital where PN is limited to severe cases only (no-PN hospital), were tested using linear mixed effects models.
- Serum LT elevations (total bilirubin, alanine- and aspartate amino-transferase, gamma-glutamyl-transferase (GGT), alkaline phosphatase) were expressed as Times Upper Limit of Normal (xULN). Severity of LT elevations was classified according to the Common Terminology Criteria for Adverse Events (CTCAE) version 4.0 grading scale.
- Differences in the occurrence of CTCAE-grade 3-4 LT elevations between PN- and non-PN users were assessed using multiple logistic regression analysis.
- Association between body weight change and length of hospital stay was assessed exploratively using multiple linear regression analysis.

Results



Body weight loss during RI treatment was significantly higher in patients of the no-PN hospital compared to patients of the PN hospitals, after adjusting for confounding variables (between-group difference 8.7%, 95% CI: 5.1-12.3%).



- Median total bilirubin levels did not exceed the ULN in both PN- and non-PN users.
- PN was associated with transient mild to moderate elevations of serum liver enzymes, mainly GGT. However, the association between PN and clinically relevant (CTCAE-grade 3-4) GGT levels was not statistically significant, which may be due to limited power (odds ratio: 2.8, 95% CI: 1.0 - 7.8).

Increased body weight loss was associated with prolonged hospitalization in both patients receiving only a single and patients receiving two intensive chemotherapy cycle(s) (regression coefficient (RC) one cycle: 0.6 days; 95% CI: 0.2-0.9 days; RC two cycles: 0.6 days; 95% CI: 0.2-1.0 days).

Conclusions

- PN seems to be an effective measure to prevent body weight loss in AML patients receiving RI treatment, since limiting the use of PN to severe cases only was associated with significantly higher body weight loss when compared to application of PN upon the first indication of inadequate oral intake. Between chemotherapy cycles, body weight did not return to pre-treatment levels, especially in patients of the no-PN hospital.
- PN was associated with mild to moderate elevations of serum liver enzymes, but not with clinically relevant (CTCAE-grade 3-4) LT elevations.
- Serum LTs should be monitored during RI treatment, especially in PN users with already existing LT abnormalities, and medical- and/or nutritional causes of LT elevations should be managed.

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