

Effect of chemotherapy dosing (actual body weight vs adjusted body weight) in adult acute myelogenous leukemia patients

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Background

- Acute myelogenous leukemia (AML) is treated with 7+3 induction chemotherapy (cytarabine and daunorubicin), with the goal of inducing remission
- Before July 2012, chemotherapy doses at the Vancouver General Hospital (VGH) were calculated based on adjusted body weight (AdjBW) in the obese
- After July 2012, actual body weight (ABW) was used
- There is compelling data in patients with breast cancer that AdjBW dosing is associated with increased disease recurrence and mortality
- However, there is little data on the effect of obesity on the pharmacokinetics of most chemotherapy
- There have been no previous studies comparing the efficacy and toxicity of AML chemotherapy dosed on ABW vs systematically AdjBW in obese patients
- Goal of this study is to examine efficacy and toxicities of 7+3 induction chemotherapy in obese patients before 2012 versus after 2012

Objectives

To determine effect of dosing 7+3 chemotherapy based on AdjBW (pre-2012) versus ABW (post-2012) in obese patients on:

- Primary:**
 - Complete remission (CR) of AML within 30 days
- Secondary:**
 - Time to platelet recovery
 - Time to neutrophil recovery
 - Bacteremia/viremia/fungemia within 30 days
 - Intensive care unit (ICU) admission within 30 days

Methods

- Design:** Single centre retrospective chart review
- Inclusion:** Adults on Leukemia/ Bone Marrow Transplant unit at the Vancouver General Hospital (VGH) receiving 7+3 induction chemotherapy between May 2007 and Aug 2014, with body mass index (BMI) ≥ 30 (included BMI < 30 as control)
- Exclusion:** HiDAC, Clinical trial (except 7+3 arm), Acute promyelocytic leukemia

Baseline Characteristics

	Pre-2012	BMI < 25 (N = 125)	25 ≤ BMI < 30 (N = 84)	BMI ≥ 30 (N = 57)
Age, mean (SD), years		51.46 (12.72)	56.37 (10.83)	51.84 (11.97)
Males, N (%)		66 (52.8)	53 (63.1)	31 (54.4)
Poor cytogenetics, N (%)		19 (15.20)	19 (22.62)	14 (24.56)
Intermediate cytogenetics, N (%)		99 (70.40)	53 (63.10)	33 (57.89)
Good cytogenetics, N (%)		10 (8.00)	9 (10.71)	9 (15.79)
Cytogenetics unknown, N (%)		8 (6.40)	3 (3.57)	1 (1.75)
	Post-2012	BMI < 25 (N = 47)	25 ≤ BMI < 30 (N = 41)	BMI ≥ 30 (N = 30)
Age, mean (SD), years		46.43 (15.92)	53.59 (11.22)	54.92 (13.57)
Males, N (%)		17 (36.2)	27 (65.9)	18 (60.0)
Poor cytogenetics, N (%)		11 (23.40)	5 (12.20)	4 (13.33)
Intermediate cytogenetics, N (%)		29 (61.70)	26 (63.41)	21 (70)
Good cytogenetics, N (%)		2 (4.26)	6 (14.63)	5 (16.67)
Cytogenetics unknown, N (%)		5 (10.64)	4 (9.76)	0

Results

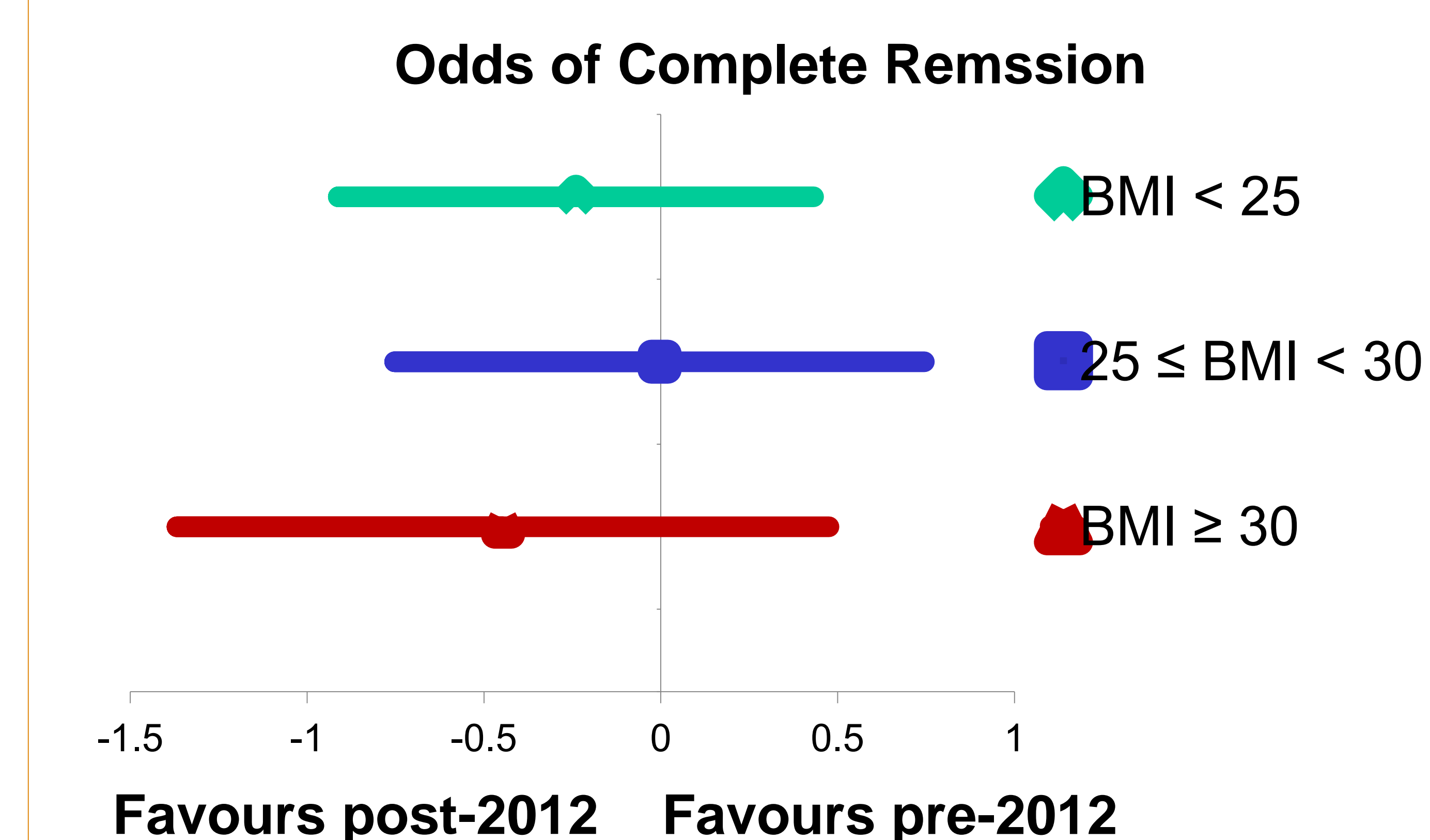


Figure 1. Plot showing 95% confidence interval for the odds ratio (log scale) for complete remission (CR) in the 3 BMI groups.

- Non-statistically significant (NSS) difference between pre-2012 and post-2012 in any BMI group for:
 - Incidence of bacteremia, viremia, or fungemia
 - Incidence of ICU admission within 30 days

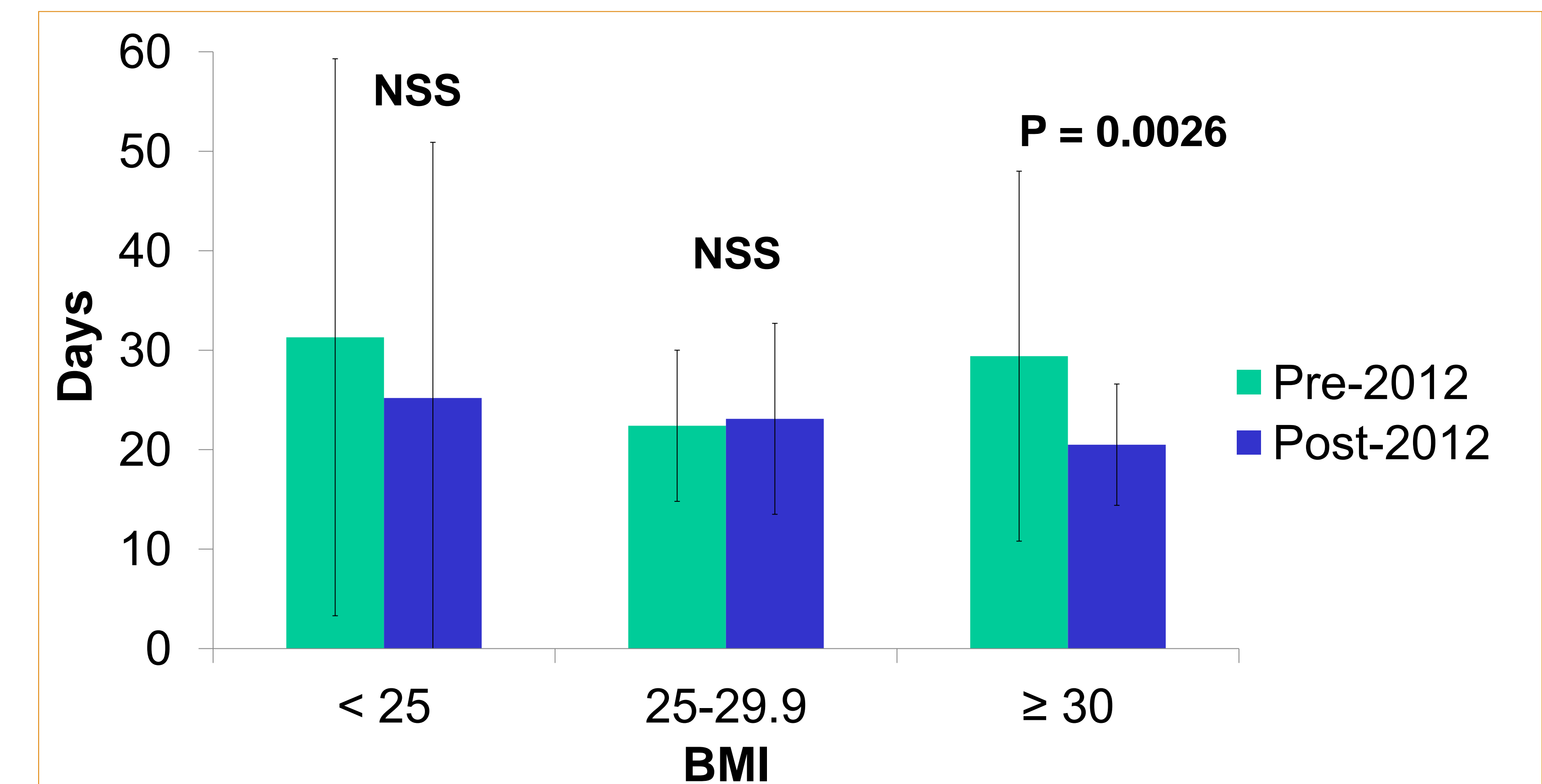


Figure 2: Average time to platelet recovery.

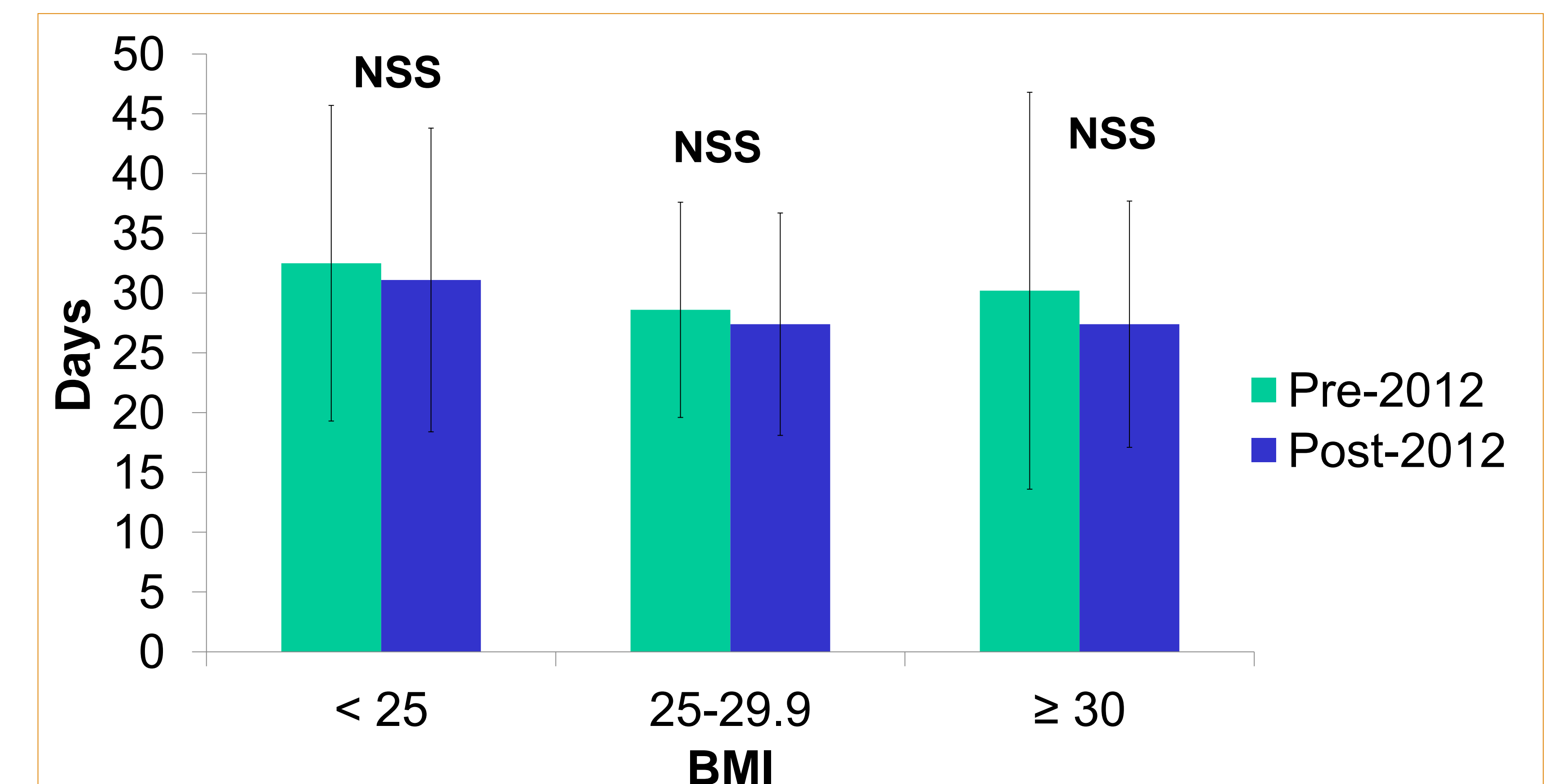


Figure 3: Average time to neutrophil recovery.

Conclusions

- Limitations:**
 - Sample size was small, and may not have been large enough to detect differences in complete remission
 - Retrospective nature: changes in standard of care possible
- Using ABW dosing in obese AML patients did not appear to alter efficacy or increase toxicity compared to using AdjBW dosing at VGH