



Assessing the incidence, timing, and risk factors for vitamin B12 deficiency following cystectomy with urinary diversion



William R Boysen, Yuan Wu, Leah Davis, Andrew C Peterson
Duke University Medical Center, Division of Urology, Durham, NC

Introduction

- The use of ileum for urinary diversion following cystectomy is standard in modern practice, but the impact on B12 absorption remains unclear
- Cases of symptomatic B12 deficiency following urinary diversion are rare, but many centers continue to routinely monitor B12 levels in patients with urinary diversions
- We sought to characterize the incidence and timing of B12 deficiency among patients with urinary diversions at our institution

Materials & Methods

- With IRB approval, we queried our institutional electronic health record for all patients who underwent cystectomy with urinary diversion between 12/1997 and 10/2018
- Patients under age 18 or without 1 year follow up were excluded
- Demographics, diversion type, and B12 assays were collected
 - B12 deficiency was defined as a value under 300 ng/L
- Descriptive statistics as well as univariable and multivariable logistic regression analysis were performed.

Results

Total sample with urinary diversion, n	1228
Meeting inclusion criteria, n (%)	856 (69.7%)
Male, n (%)	611 (71.4)
Female, n (%)	245 (28.6)
BMI, median (IQR)	27.1 (24.1-30.4)
Follow up in months, median (IQR)	16 (15-41)
B12 Monitoring performed, n (%)	299 (34.9)
B12 Deficiency detected, n (%)	149 (49.8)
Duration to B12 deficiency, months	10 (3-24)

B12 deficiency is common: detected in 49.8% of monitored patients

Patients who developed B12 deficiency were: Younger (age 62.5 years versus 66.4, p=0.003)

More likely to have undergone continent diversion (19.5% versus 10.7%, p=0.049)

Gender, race, and BMI did not vary between groups

On univariate regression analysis:

Lower age decreased the odds of developing B12 deficiency (OR 0.97, 95%CI 0.95-0.99, p=0.002)

Continent diversion increased odds of B12 deficiency (OR 2.02, 95% CI 1.06-3.99 p=0.04)

On Multivariate regression analysis:

	OR (95% CI)	p-value
Age at surgery, years	0.97 (0.94-1.00)	0.063
Female gender (ref=male)	2.17 (1.04-4.52)	0.038
African American race (ref=Caucasian)	0.4 (0.14-1.13)	0.083
Continent diversion (ref=incontinent)	1.6 (0.68-3.73)	0.28
BMI	0.96 (0.90-1.01)	0.133

Female gender increased the odds of B12 deficiency (OR 2.17, 95%CI 1.04-4.52, p=0.038)

Conclusions

- In this large institutional series, B12 monitoring was performed infrequently but B12 deficiency was common (detected in nearly half of screened patients)
- Patients of older age and with continent diversion had higher odds of developing B12 deficiency on UV analysis
 - Female gender increases the odds of developing B12 deficiency on MV analysis
- Routine screening of patients for B12 deficiency following urinary diversion is warranted, with particular attention to females and those with continent diversions.