Administration of Vitamin B Complex Improves Renal Recovery in Patients With AKI (VIBAKI trial)
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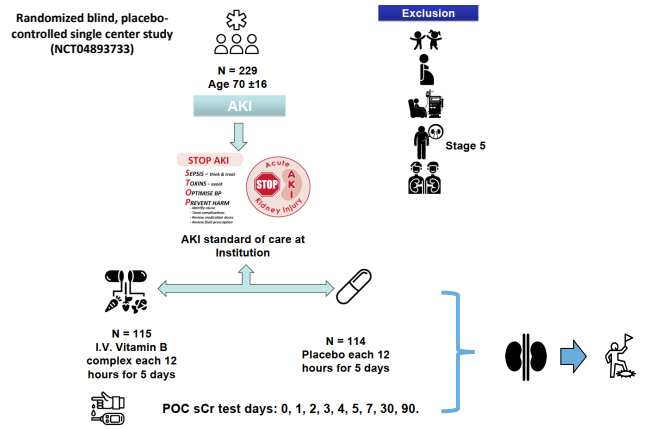
Introduction

Acute kidney injury (AKI) is a common complication with adverse consequences in hospitalized patients. Preclinical studies have identified that NAD^+ augmentation as a potential strategy for the prevention and treatment of AKI. NAD^+ is the final metabolized form of vitamin B3. Since there is no availability of vitamin B3 in the country; we tested if I.V. vitamin B complex (vitamin B1, B6 and B12) could improve renal recovery in patients with AKI. By oxidation, vitamin B6 through the pathway of pentose phosphate lead to the formation of NADPH (nicotamide adenine phosphate dinucleotide) an analog of NAD^+.

Methods and Materials



Results

Table 1 – Baseline characteristics of patients in both arms

	Vitamin B complex n = 115	Placebo N = 114	*P* value
Age (years)			
Median	71 ± 16	70 ± 16	0,29
Gender, n (%)			
Male	74 (64,3%)	65 (57%)	0,004
AKI KDIGO stage, n (%)			
1	34 (29,6%)	63 (55,3%)	<0,001
2	42 (36,5%)	28 (24,6%)	<0,001
3	39 (33,9%)	23 (20,2%)	<0,001
Baseline sCr and eGFR (CKD-EPI)			
Admission sCr (mg/dl)	2,88 ± 1,4	2,36 ± 1,3	0,006
eGFR (ml/min/1.73 m^2)	64,5 ± 27	61,8 ± 25	0,63
Baseline sCr (mg/dl)	1,49 ± 2,5	1,8 ± 7	0,21
ACR and PCR (spot urine)			
ACR (mg/g)	208 ± 288	374± 675	0,67
PCR (mg/g)	1492 ± 1819	1277 ± 1568	0,52
AKI etiology, n (%)			
Pre Renal	50(43,5 %)	50(43,9%)	0,95
Infection	20 (17,4%)	17(14,9%)	0,61
ATN	8 (7%)	8 (10,1%)	0,46
HRS	5 (4,3%)	5 (4,4%)	0,98
CRS	7 (6,1%)	8 (7%)	0,77
Nephrotoxins	8 (7 %)	8 (7%)	0,98
Obstructive	4 (3,5%)	3 (2,6%)	0,71
Herbal medicines	4 (3,5%)	3 (2,6%)	0,71
AIN	2 (1,7%)	4 (3,5%)	0,41
Glomerulonephritis	7 (6,1%)	4 (3,5%)	0,36
Nephrotoxins, n (%)			
PPI	16 (13,9%)	26 (22,8%)	0,076
ARBs	20 (17,4%)	25 (21,9%)	0,387
NSAIDs	11 (9,6%)	14 (12,3%)	0,495
ACEs	4 (3,5%)	8 (7%)	0,229
Comorbidities, n (%)			
Age >65 years	81 (70,4%)	84 (73,7%)	0,584
Chronic cardiac disease	41 (35,7%)	42 (36,8%)	0,851
Type 2 diabetes mellitus	35 (30,4%)	42 (36,8%)	0,305
Cancer	20 (17,4%)	20 (16,5%)	0,976
Anemia	26 (22,6%)	37 (32,5%)	0,095
Chronic kidney disease	28 (34,6%)	17(21,5%)	0,292
Dehydration	19 (16,5%)	12 (10,5%)	0,185
Chronic pulmonary disease	18 (15,7%)	18 (15,8%)	0,977

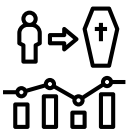
Results

Figure 1. Primary outcome and other secondary outcomes by day 7

	Vitamin B complex (n = 115)	Placebo (n = 114)	*P* value
sCr	1.75 mg/dL	2.01 mg/dL	0.02
Drop in sCr	1.13 mg/dL	0.35 mg/dL	<0.001
Complete recovery	58.3%	34.2%	0.004
Partial recovery	27%	29.8%	0.850
No recovery	14.8%	36%	0.005

Figure 2. Long term outcomes (day 30): *de novo* CKD and CKD progression

	Vitamin B complex (n = 102)	Placebo (n =90)	*P* value
No CKD progression	55.7%	30.7%	0.081
De novo CKD	21.7%	28.1%	0.113
CKD progression	9.6%	20.2%	0.009



Ninety-day mortality was higher in patients who received placebo as compare with patients who received vitamin B complex (79.5% vs. 52.5%).

Conclusions

The administration of vitamin B complex could accelerate renal recovery in patients with AKI by day 7, reducing the percentage of patients who will not recover renal function after an AKI episode. Vitamin B complex administration reduce CKD progression, but no differences where found in the percentage of de novo CKD. Ninety-day mortality was higher in patients who received placebo. The preliminary data of our study warrants future studies to validate these findings.

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