VANCOMYCIN THERAPY IN INTENSIVE CARE UNIT (ICU)- THERAPEUTIC LEVELS AND NEPHROTOXICITY

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INTRODUCTION AND AIMS

Vancomycin is the gold standard for methicillin resistant *Staphylococcus aureus* infection treatment and has been traditionally administered as an intermittent infusion [IIT].

Administering vancomycin as a continuous infusion [CIT] is a recent approach trying to improve its efficacy and renal safety profile.

We aimed to study the renal safety of each approach and factors associated with the renal function and vancomycin levels during treatment.

METHODS

Study

- Type: Retrospective
- Population: All patients admitted in a terciary ICU and submitted to vancomycin therapy for more than 72h (n = 95)
  - Exclusion criteria: Chronic kidney disease under renal replacement therapy; Renal replacement therapy prior to Vancomycin administration
- Time: From January of 2012 to October of 2013
- Demographic, clinical, biochemistry and mortality data were collected from the ICU Department Register.

Definitions: Acute kidney injury [AKI] development was defined as an increase in serum creatinine > 50% after vancomycin therapy.

Toxic vancomycin levels were considered with a trough level >25µg/mL

McNemar test, Chi-squared test and a logistic regression model were used. Significance was set at α=0,05.

RESULTS

	N = 95
Age (mean +/- std deviation)	66 +/- 17
Male (%)	54%
APACHE II (mean +/- std deviation)	22,3 +/- 5
Serum Creatinine (median, P25 – P75) mg/dL	1,04 (0,8-1,57)
Vancomycin treatment duration (days) (mean +/- std deviation; [min-max])	10 +/- 4,4 [4 - 26]
Continuous infusion (%)	43,2%
Aminoglycoside co-adm. (%)	18%
AKI (%)	28,4%
Global Mortality (%)	27,3%

	S Creat pre-Vanco (mg/dL)	Vanco D1 (ug/mL)	Vanco D5 (ug/mL)	Vanco D10 (ug/mL)	Vanco Toxic levels (%)	Maximum S Creat (mg/dL)	AKI (%)
Continuous infusion	1.12 ± 0.8	13.7 ± 5.3	22.6 ± 7.9	20.1 ± 5.5	73.1	1.24 ± 0.6	29.3
Intermitent infusion	1.42 ± 0.9	9.1 ± 5.5 ***	17.3 ± 7.8	18.1 ± 7.3	38.8 *	1.85 ± 1.4 **	27.8

* p < 0.05; ** p < 0.01; *** p < 0.001

Continuous infusion

	Odds ratio	IC 95%
Vanco Toxic levels	14.3	3.67-55.6
Maximum S Creat	0.41	0.17-1.0

AKI

	Odds ratio	IC 95%
Vanco Toxic levels	7.8	1.99 – 33.1
Mortality	3.7	1.1 – 12.7
Male gender	0.3	0.1 – 0.99

Models adjusted for: Age, gender, basal creatinine, duration of therapy and Aminoglycoside co-administration

CONCLUSIONS

The continuous administration of vancomycin was associated with higher and early therapeutic vancomycin levels and it wasn´t associated to AKI development.

Acute kidney injury was only associated with vancomycin toxic levels and gender. Moreover, as expected, mortality was higher in patients that developed AKI.

Continuous infusion of vancomycin can become an interesting tool for ICU care of methicillin resistant *Staphylococcus aureus* infection given its early therapeutic levels and safely profile.

REFERENCES

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