Effects of clinical decision support on the TDM of gentamicin and vancomycin in newborns

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Background

- Gentamicin dosing scheme, and gentamicin and vancomycin therapeutic drug monitoring (TDM) in newborns is very heterogeneous in our institution.
- Once daily dosing (ODD) of gentamicin and trough levels measurement is recommended in the literature for most patients.

Material and Method

- Newborns (< 28 days of life) receiving either gentamicin or vancomycin
- Before and after guidelines implementation
- Chart analysis criteria:
  - % of ODD gentamicin dosing schemes
  - % of peak levels, mean (+/-SD) number of levels sampled
  - % of therapeutic levels defined as: gentamicin trough level ≤ 1 mg/L; vancomycin trough level: 5-15 mg/L
- Statistical analysis: Fisher’s exact, Wilcoxon ranksum tests (STATA® 1.0)

Results

Gentamicin:
- 132 (case) vs 102 (control) patients included (tab.1)
- Guidelines implementation: ODD scheme used, blood sampling reduced, significant higher % of trough levels ≤1 mg/L (tab.1, fig.1)

Vancomycin:
- 38 (case) vs 37 (control) patients included (fig.2)
- Guidelines implementation: blood sampling reduced, no difference in the % of therapeutic levels, trough levels > 15 mg/L more frequent (tab.2, fig.4)

Conclusion

Our guidelines implementation induced a strong reduction in blood sampling among newborns. Gentamicin dosing and TDM were highly improved. In the future, clinical and economical effects of the guidelines should be evaluated.