



# THERAPEUTIC DRUG MONITORING OF GENTAMICIN IN NEONATES

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## BACKGROUND AND IMPORTANCE

Peak (maximum plasma concentration)/MIC > 8-15 is pharmacokinetic (PK)/pharmacodynamic (PD) parameter that best correlates with effectiveness of aminoglycosides. A peak between 8-15 mg/L is necessary to achieve it. In neonates, doses between 3-5 mg/kg/day the first week and 7,5 mg/kg/day from the second to the fourth week of life, are recommended.

## AIM AND OBJECTIVES

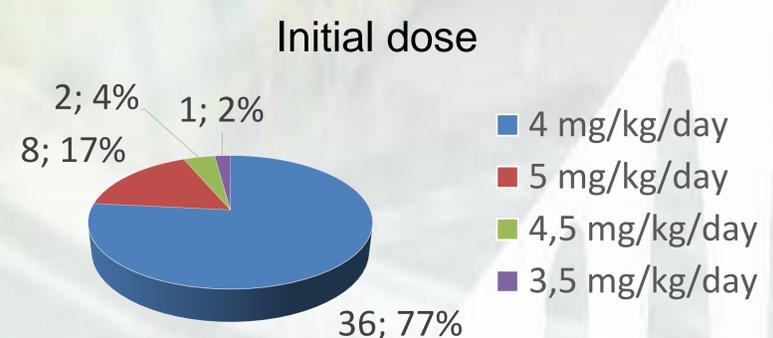
Evaluate the degree of adequacy of the initial dose with current recommendations and whether therapeutic drug monitoring (TDM) allows optimization of treatments.

## MATERIALS AND METHODS

Retrospective study from 1-1-2016 to 02-29-2020, in a general university hospital. Patients 0-35 days old treated with gentamicin and with plasma concentrations (Cp) were reviewed. The descriptive analysis was performed with SPSSv.24 program.

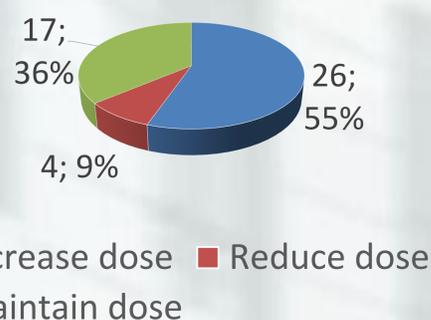
## RESULTS

TDM	47 neonates	
Age	3 (0-33) days	26 (55,3%) < 7 days old
Gender	33 (70%) men	
Type of infection	Neonatal sepsis	35 (72,3%)
	Urinary infection	7 (14,9%)
Ampicilin	45 (95,7%)	
Empiric	34 (72,3%)	
Duration of treatment	6 (2-9) days	



### First recommendation (TDM in 47 neonates):

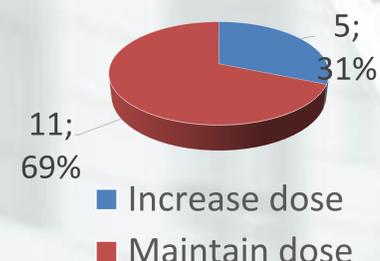
Cp were extracted with a median of 2 days (1-4) after start, the median of peak was 7,5 mg/L (3,5-21,6), 29 (62%) had a peak < 8 mg/L. The trough was < 0,2 mg/L in 26 patients and of those that was quantified, the median was 0,4 mg/L (0,2-1,3), being higher than 1 mg/L only in a case.



90% of acceptance

### Second recommendation (TDM in 16 neonates):

Median peak of 9 mg/L (6-12) and trough always less than 0,5 mg/L



94% of acceptance

## CONCLUSION AND RELEVANCE

The dose prescribed has been lower than recommended in neonates > 1 week old. Cp let to detect and correct deviations from the recommended peak or trough in 64% of cases, mainly due to low peak, with a high acceptance of TDM. Plasma determination and TDM of gentamicin continues to be an essential tool to achieve the recommended PK/PD.

## REFERENCES

- Fuchs A, Bielicki J, Mathur S et al. Reviewing the WHO guidelines for antibiotic use for sepsis in neonates and children. Paediatr Int Child Health 2018;38(sup1):S3-S15.
- Bijleveld YA, van Den Heuvel ME, Hodiament CJ, et al. Population pharmacokinetics and dosing considerations for gentamicin in newborns with suspected or proven sepsis caused by Gram-negative bacteria. Antimicrob. Agents Chemother 2016; 61(1): e01304–e01316.