LONGITUDINAL ANALYSIS OF ANTIMICROBIAL CONSUMPTION IN NEONATAL INTENSIVE CARE UNIT: THE USE OF DEFINED DAILY DOSES

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Background

Monitoring of antimicrobial consumption in neonates is essential, but there are limited longitudinal data because of the absence of standardized metrics.[1,2]

Defined daily doses (DDDs) are recommended by the World Health Organization for monitoring antimicrobial consumption currently only for adults.[3]

Aim

To use the methodology of DDDs and assess the pattern and time trends of antibiotic consumption (AMC) in a Neonatal Intensive Care Unit (NICU) for 15 years.

Methods

Study design: Retrospective study
Setting: A 44-bed neonatal unit (15 NICU beds) in a tertiary-care level hospital in Thessaloniki, Greece
Duration: January 2002 to December 2016
Time periods: 2002-2006, 2007-2011, 2012-2106
Data source: Data of AMC were obtained from the hospital pharmacy and number of bed-days was obtained from Hospital Office of Statistics.
Measure of antimicrobial use: AMC was expressed as defined daily doses per 100 bed-days (DDDs/100BD), as recommended by the World Health Organization for adults[1]. The software used for the data processing was the ABC Calc (Microsoft®)[4].

$$N \text{ DDDs of an antibiotic} = \frac{\text{grams of antibiotic consumed}}{\text{Gram per DDD(WHO)}}$$

Only antimicrobial agents (antimicrobial J01) used for systematic use were recorded.

Results

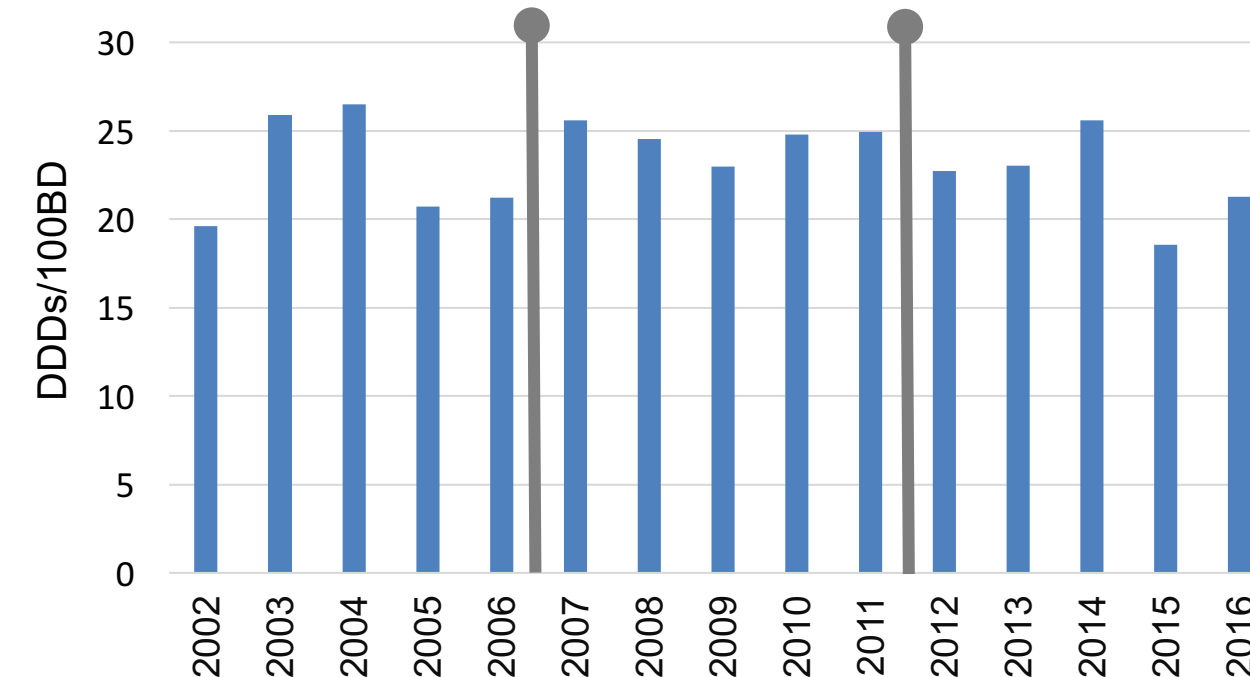The median total AMC ranged between 21.2 and 24.8DDD/100BD during study period.(Figure 1)

Figure 1: Total antimicrobial consumption in 3 study periods

Ampicillin (**AMP**) had the highest consumption among all antimicrobials and had a non-significant decrease especially during the third period (from 9.9 to 9.0DDD/100BD). **Aminoglycosides** (**AMG**) consumption followed ampicillin consumption and ranged between 3 and 4DDD/100BD.
During the first study period **3rd and 4th generation cephalosporins (3/4GC)** were frequently used; however, their consumption reduced from 4.3 to 1.8DDD/100BD at the third time period. **Carbapenem** (**CAR**) consumption had no significant change (2.4-2.6DDD/100BD).
Glycopeptide (**GLY**) use showed an increase during the second period (from 2.3 to 3.1DDD/100BD) and then a reduction to 2.5DDD/100BD. The same trend was observed for **fluoroquinolones** (**FQL**), which had the lowest consumption: increased from 0.2 to 0.8DDD/100BD and then reduced to 0.6DDD/100BD. (**Figure 2**)

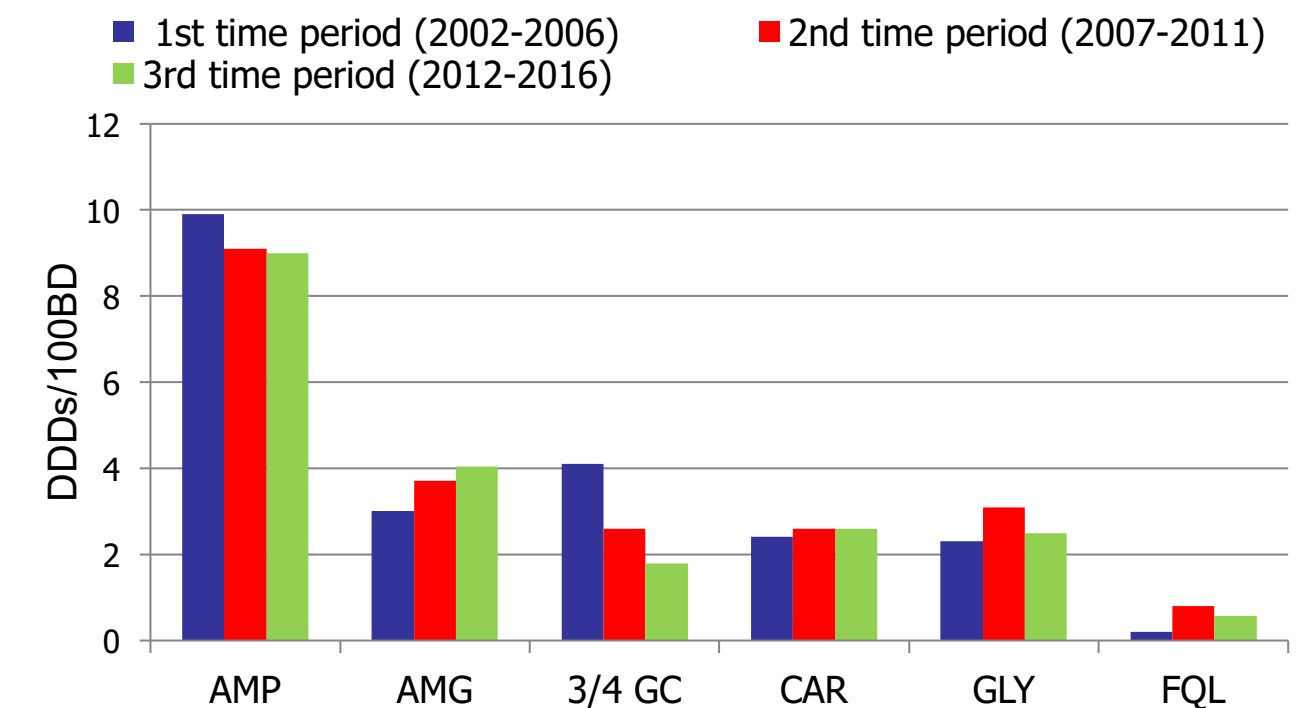Metronidazole consumption was constantly low (0.1-0.2DDD/100BD).

Figure 2: Antimicrobial consumption of commonly used antimicrobials

Conclusion

- **Longitudinal analysis of antimicrobial consumption in NICU using the DDD methodology was feasible and provided analyzable data.**

- **Pattern and trends of antimicrobial consumption may be used for designing antimicrobial usage guidelines.**

References

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