USE OF ANTIBIOTICS IN PEDIATRIC PATIENTS: A PREVALENCE-SURVEY CONDUCTED IN FOUR ITALIAN CHILDREN'S HOSPITALS

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Background

To measure antibiotic use among inpatient children is useful to plan actions aimed to improve appropriateness of antibiotic prescribing. Defined Daily Dose (DDD) is the most commonly used metrics to estimate antibiotic consumption in adults, but its use in children is not recommended[1].

This study aimed at assessing prevalence of antibiotic use in Italian pediatric hospitals; moreover, alternative measurements for antibiotic use in children as days-of-therapy (DOT), lenght-of-therapy (LOT) and prescribed daily doses (PDDs) were estimated.

Methods

Prevalence survey was conducted in four Italian pediatric hospitals during a one-week period between November-December 2016. Antibiotic therapies (ATC: J01) and reasons for treatment were collected by reviewing medical charts of all hospitalized patients. Antibiotic consumption on the survey date was expressed as prevalence of use. DOTs, LOTs and PDDs were computed considering antibiotic treatments administered in the 30 days preceding the survey date. DOTs and LOTs per 100 patients-days were calculated for therapeutic treatments only. The median PDDs by age groups and type of molecules were compared to DDDs (PDD:DDD ratio)[2].

References
1) **WHO Collaborating Centre for Drug Statistics Methodology, Guidelines for ATC classification and DDD assignment 2016. Oslo, 2016.**
2) **Amadeo B, Zarb P, Muller A** *et al.* **on behalf of the ESAC III Hospital Care Subproject Group European Surveillance of Antibiotic Consumption (ESAC) point prevalence survey 2008: paediatric antimicrobial prescribing in 32 hospitals of 21 European countries. J Antimicrob Chemother 2010; 65: 2247–2252.**

Results

Among 810 surveyed children, 380 (46.9%) received one or more antibiotic(s) on the survey date. Surgical prophylaxis (N=116) was the main indication of use among patients who were administered a systemic antibiotic, followed by medical prophylaxis (N=103), community-acquired infections (CAIs, N=107) and hospital acquired infections (HAIs, N=61) (Figure 1).

Figure 1 shows the indication of treatment among antibiotic users.
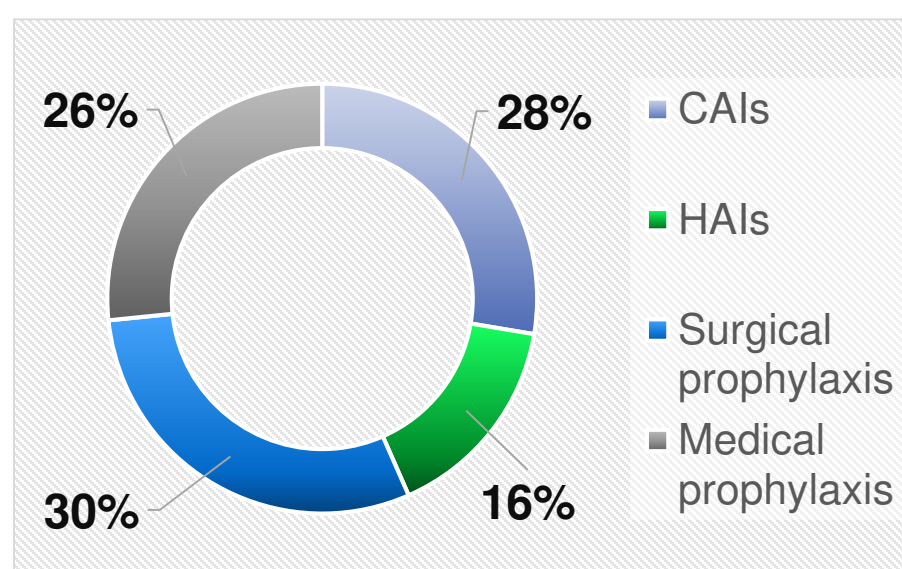
The pattern of antimicrobial use varied by indication (Figure 2).

First-generation cephalosporins (J01DB) were the most used molecules administered for surgical prophylaxis, whereas combinations of sulphonamides and trimethoprim (J01EE) were the top class for medical prophylaxis. Combinations of penicillines, including β-lactamase inhibitors (J01CR) and amynoglicosides (J01GB) were the most prescribed molecules for CAIs and HAIs, respectively.

Figure 2 shows, for each antibiotic molecule, the proportion of treatments administered by indication of use (only treatments administered with a frequency > 3% were shown)
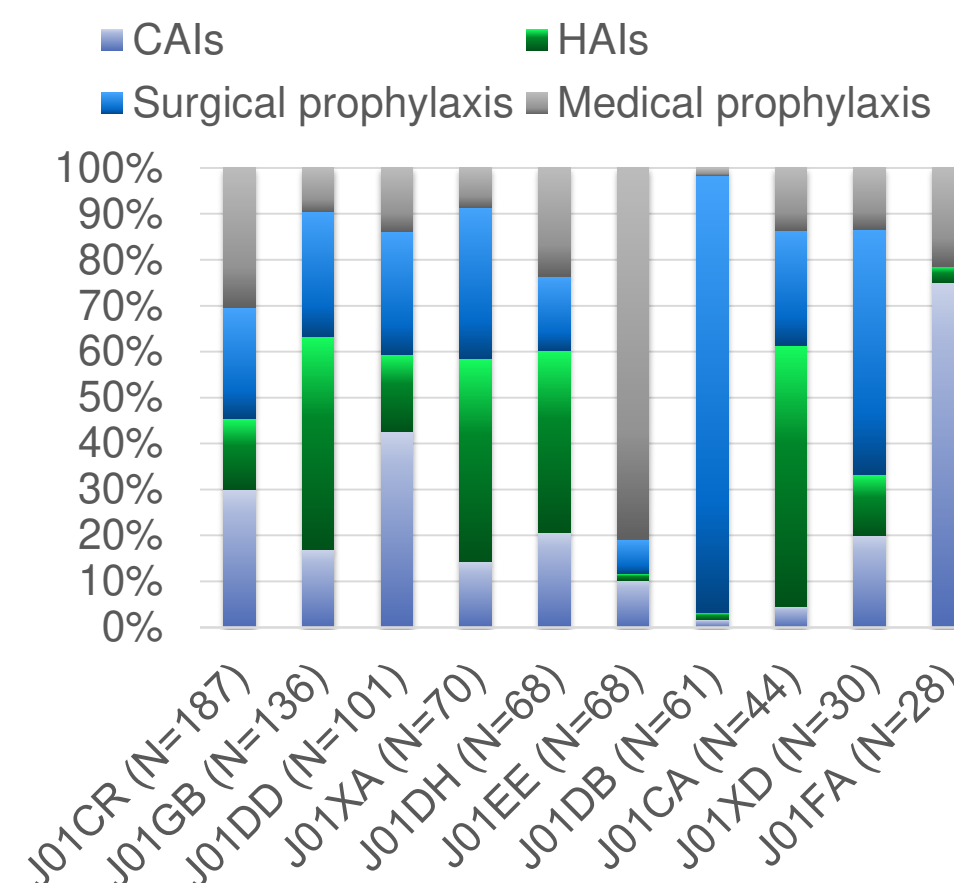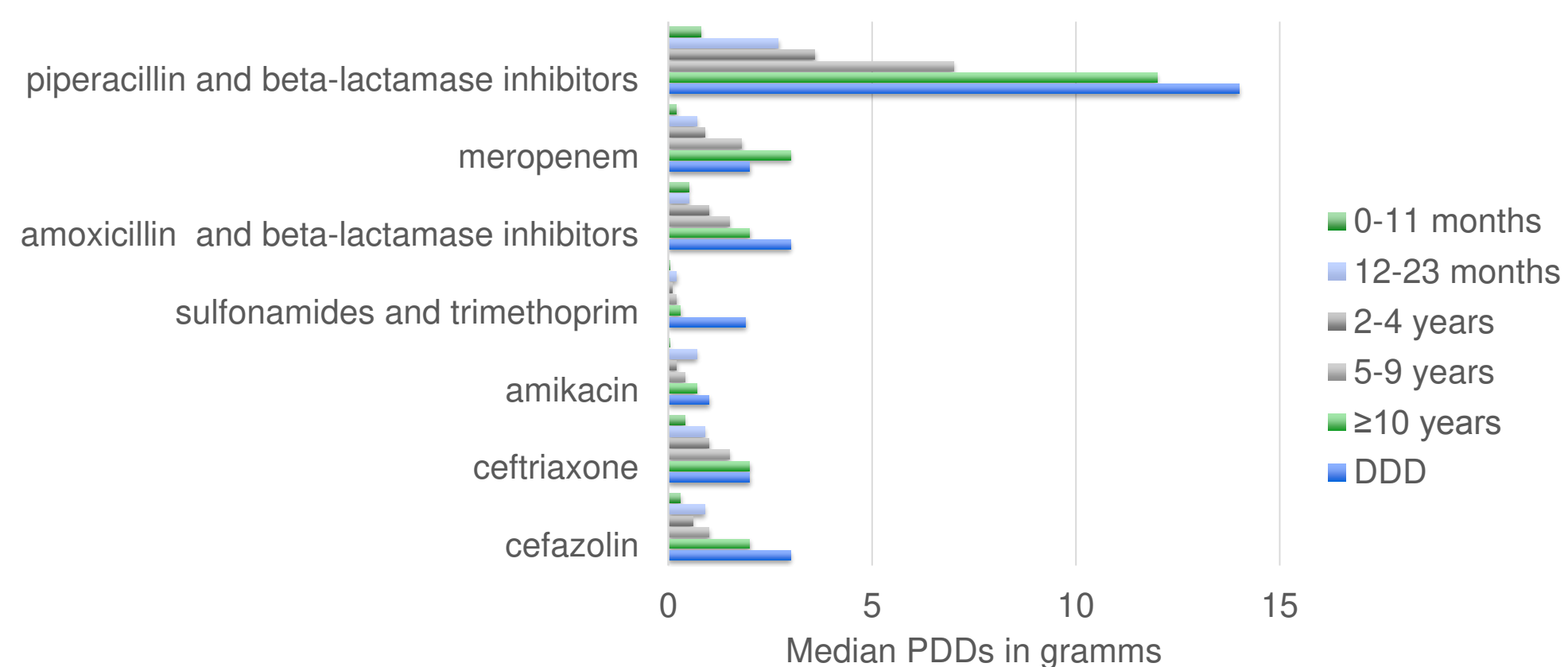

Alternative indicators of antibiotic use in children

Out of 883 antibiotic treatments, 414 (47%) were administered for therapeutic purposes. We estimated a DOT of 33.1/100 patient-days and a LOT of 19.1 per 100 patient-days.

Median PDD approximated DDD in children aged ≥10 years only; moreover, the PDD:DDD ratio was highly variable among antibiotic molecules in this age group (Figure 3).

Conclusions

Our data confirmed that DDDs cannot be used to measure pediatric antibiotic use. Prevalence of antibiotic use represented a good proxy of LOTs (prevalence of antibiotic use for therapeutic purposes: 21% *versus* LOT: 19 per 100 patient-days) especially in a context where computer-based prescribing has not yet been developed.

Figure 3 Median PDDs of the most used antibiotic molecules by age classes