Antibiotic use in neonatal care: measuring cumulative exposure in point prevalence surveys identifies high infant-level antibiotic exposure

P2328

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NeoIPC

Introduction

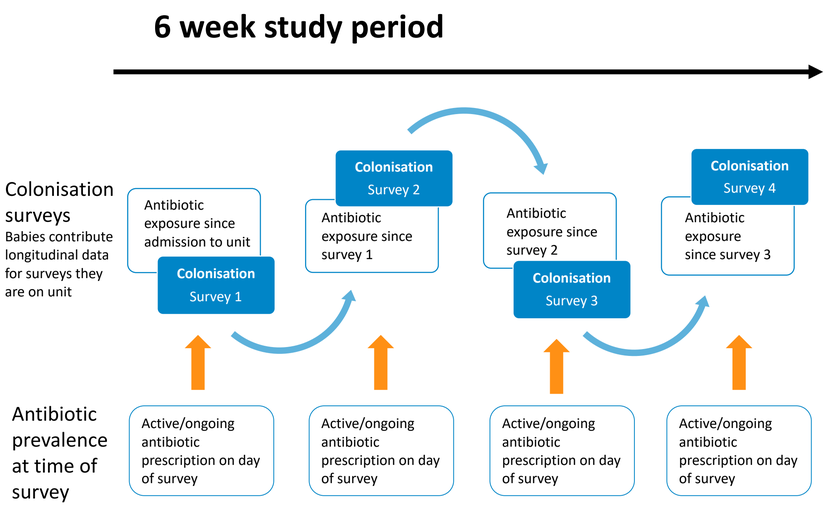
- Infants on neonatal units may be repeatedly exposed to antibiotics
- Standard point prevalence surveys (PPS) cannot capture repeated treatment and may underestimate true antibiotic exposure
- Understanding patient-level antibiotic use throughout their stay is important to design and evaluate antibiotic stewardship interventions
- Cumulative (longitudinal) antibiotic measurement incorporated into PPS could provide comprehensive data on antibiotic utilization
- We aimed to investigate the added value of integrating cumulative data collection into standard PPS

Methods

- The NeoIPC colonisation feasibility assessment is part of the wider NeoIPC project
- Data were collected anonymously
- 18 neonatal units in 7 European countries participated

Colonisation surveys (4 timepoints, see below) captured antibiotic use as follows:

- Ongoing at the time of each survey (PPS)
- From admission to neonatal unit up to first survey (cumulative)
- In between each survey (cumulative)



Results

653 infants participated in at least one colonisation survey

422/653 (64.6%) received <u>at least one course</u> of antibiotics since admission to the neonatal unit

229/653 infants <u>never</u> received antibiotics	**422/653 infants <u>ever</u> received antibiotics**
Gestational age 36 weeks (IQR: 33-38)	Gestational age 33 weeks (IQR: 29-38)
Birthweight 2435 (IQR: 1801-3257)	Birthweight: 2010 (IQR:1140-3130)

<u>102 different</u> antibiotic regimens received → median 4 courses per baby (IQR: 2-7 courses)

- Ampicillin + Gentamicin: 350 courses
- Gentamicin: 125 courses
- Meropenem + Vancomycin: 100 courses
- Vancomycin: 97 courses

Different patterns of use by gestational age and postnatal age

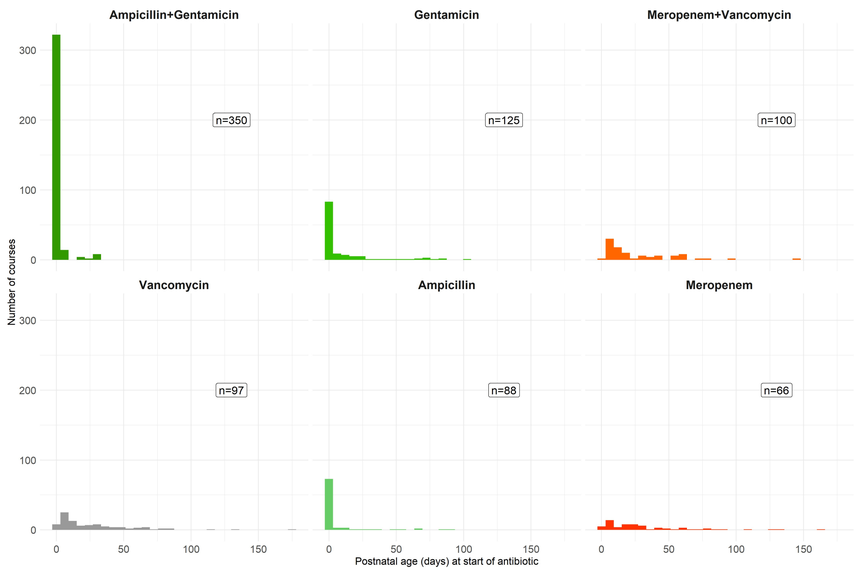


Figure 3. Most common antibiotic regimens received since admission (cumulative) by postnatal age at start of treatment

~ 25% receiving active antibiotics at the time of the survey (PPS)

Survey 1	**Survey 2**	**Survey 3**	**Survey 4**
25% (79/315)	26% (84/318)	22% (69/307)	21% (67/317)

Figure 4. Most common antibiotic regimens received on the day of the survey (PPS) by postnatal age

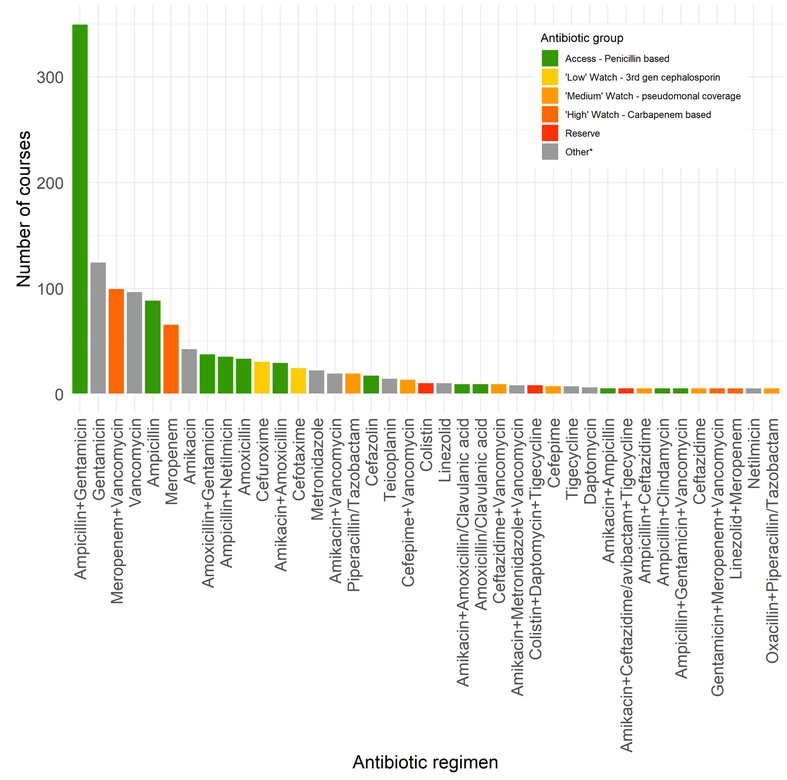


Figure 1. Overall antibiotic exposure (cumulative) by antibiotic regimen and number of courses given overall. Only displaying regimens with >5 courses; colours represent WHO AWaRe groups as adapted in Russell et al (2022)[1]

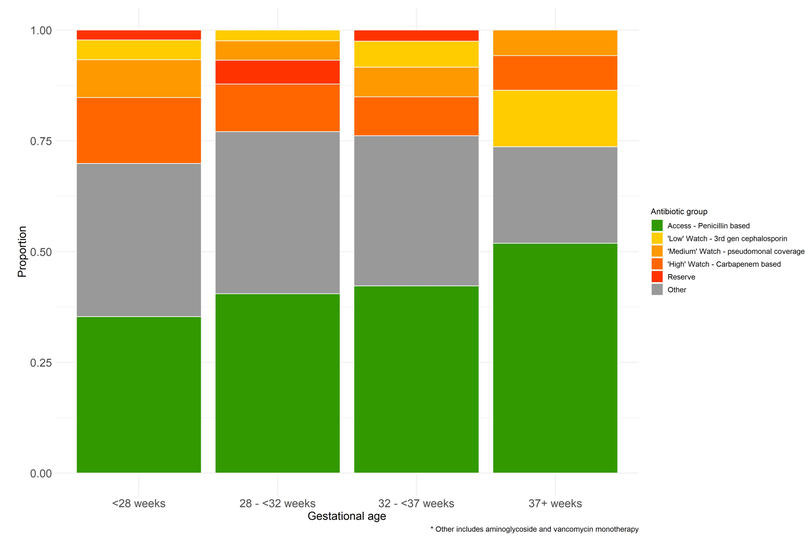


Figure 2. Antibiotic exposure (cumulative) by gestational age and WHO AWaRe categories[1]

Conclusions

- 2/3 infants in high technology neo-natal units in Europe are exposed to antibiotics during their stay
- The most commonly used antibiotics in this setting are from the WHO AWaRe Access group
- However, Watch and Reserve group agent use is high among the most vulnerable preterm patients and tends to occur later on during inpatient stay
- PPS largely fail to capture repeated exposures and therefore misrepresent antibiotic exposure for long-stay preterm infants in quantity & quality
- These findings are likely relevant to repeatedly exposed populations (e.g. adults in long term care facilities) and settings with multimodal distributions of length of stay

Learn more about the NeoIPC Project here!

[1] Russell, N., Stöhr, W., Plakkal, N., Cook, A., et al. (2022). Patterns of antibiotic use, pathogens and clinical outcomes in hospitalised neonates and young infants with sepsis in the NeoOBS global neonatal sepsis observational cohort study. *MedRxiv*. https://doi.org/10.1101/2022.06.20.22276674

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