The Global Point Prevalence survey of Antimicrobial Consumption and Resistance (Global-PPS): evidence of poor laboratory use as a barrier to antimicrobial stewardship in Nigerian hospitals

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Introduction

- The principle of rational antimicrobial use includes
  - targeted prescribing at the pathogen
  - accurate (definitive) diagnosis
- This involves
  - microbiology investigation to detect specific pathogen
  - and/or a check of biomarkers when the organism is not likely to be present in the samples any longer
- Routine culture and sensitivity provides antibiogram for institutional guidelines on empiric therapy
  - Also surveillance of clinically important resistance
- A uniform and standardized method for surveillance of antimicrobial use in hospitals was used
  - To assess the variation in antimicrobial prescribing in Nigerian hospitals as part of the Global-PPS project

Methods

- Global-PPS was carried out in 8 tertiary hospitals in Nigeria between November and December 2017
- All inpatients receiving an antimicrobial on the day of the point prevalence survey were included
- Validated data tool was used to collect information on
  - patients‘ demographics
  - antimicrobial agents
  - indications for treatment
  - microbiological data
  - a set of quality indicators including
    - targeted prescribing
    - use of biomarkers
    - MDROs

Methods

- A web-based application used for data-entry, validation and reporting was designed by the University of Antwerp, Belgium (www.global-pps.com).
- Data analysis was done with Excel and Epi Info version 7.2
- Frequencies and Proportions were calculated

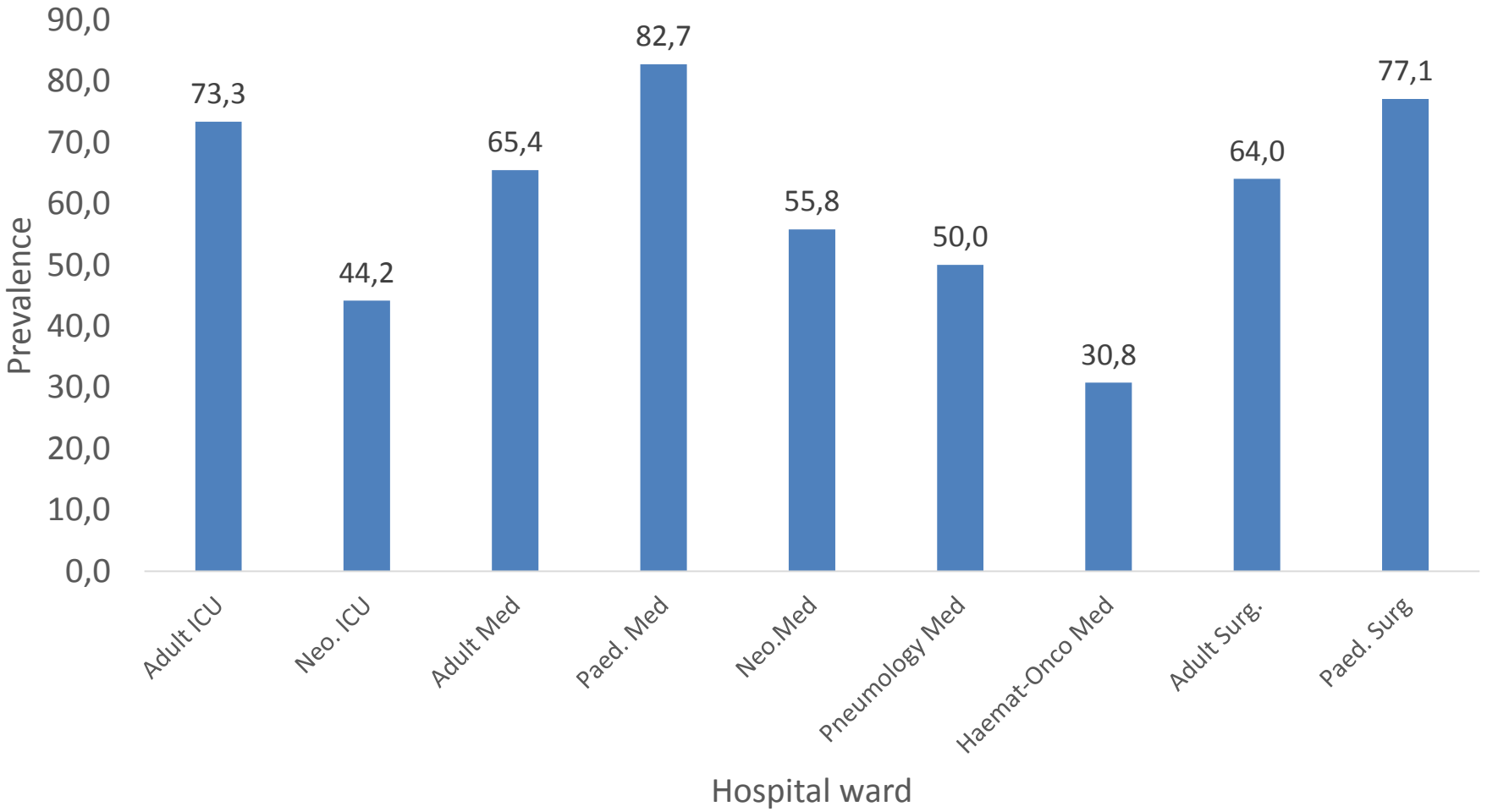
Result

- 8 hospitals
- 7 teaching hospitals and one secondary care centre
- One of the teaching hospitals is privately owned
- 1,764 eligible patients admitted to 157 wards
- 1,170 received 2180 antimicrobials
  - Prescribing rate 66.32% (overall)
  - Some on multiple antibiotics

Antibiotic prescribing rates in Nigerian Hospitals

Hospital	No of eligible patients	Antibiotic Prescribing rates (%)
LUTH	258	65.5
NHA	144	63.2
ABUTH	346	71.7
FETHA	220	78.2
BUTH	53	52.8
SSH	79	79.7
UITH	213	61.0
UCH	451	59.6

Prevalence of Antibiotic Use by Ward in Nigeria



Quality indicators and the antibiotic prescribing pattern in Nigerian Hospitals

Quality Indicators	Frequency (n=2180)	Proportion (%)
Stop/Review Date		
Yes	740	33.9
Reason in note		
Yes	1599	73.4
Guideline compliance		
Yes	131	6.0
Treatment based on Biomarker data		
Yes	10	0.4
Treatment		
Targeted	69	3.2
Route of administration		
Parenteral	1396	64.0

Pattern of Microbiology Laboratory use versus Antibiotic prescribing in Nigerian Hospitals

Hospital	Treatment		Bio-marker Use
	Targeted	No of MDROs	Yes
LUTH	2 (0.7%)	2	0 (0)
NHA	3 (1.8%)	2	0 (0)
ABUTH	7 (1.6%)	2	0 (0)
FETHA	21 (5.5%)	3	0 (0)
BUTH	14 (25.0%)	9	0 (0)
SSH	0 (0%)	0	0 (0)
UITH	5 (2.0%)	4	0 (0)
UCH	17 (3.8%)	11	10 (2.2)

MDROs Detected

- MRSA =2
- MRCoNS =0
- VRE =2
- ESBL-producing Enterobacteriaceae =6
- 3rd generation cephalosporin resistant =13
- ESBL-producing non fermenter Gram-negative bacilli =7
- Carbapenem-resistant non fermenter Gram-negative bacilli = 3
- Targeted treatment against other MDR organisms = 7

Results

- Antimicrobials were prescribed for
  - –community acquired infections (57%)
  - –surgical prophylaxis (30.6%),
  - –hospital acquired infections (11.4%)
  - –medical prophylaxis (9.7%)

Results

- **Most commonly prescribed antibiotic and (the most commonly used in the class) were**
  - Cephalosporins (ceftriaxone 57%)
  - Nitro-imidazoles (metronidazole 99,4%)
  - Quinolones (ciprofloxacin 67%)
  - Penicillin+combination (amoxicillin +combination 73%)

Discussion

- **Lack of definitive diagnosis would be a barrier to antimicrobial stewardship:**
  - Precludes definitive antibiotic therapy
  - Inadequate antibiogram from routine Microbiology procedures (which forms the basis of empiric therapy)
  - Undermines recognition of clinically important resistance and appropriate treatment
  - Need to pay attention to the magnitude of MDROs in the country

Reasons must be sought and issues addressed

- Possibly
  - lack of confidence in the laboratories
    - Financial challenges
      - Non-availability of tests due to stock-outs
    - Inadequate infrastructures in some hospital Labs
    - Long TAT due to manual techniques
    - Very few centres have automated blood culture equipment
  - lack of awareness of the importance of Microbiology diagnosis
  - sheer nonchalance or poor attitude of prescribers towards appropriate use of antimicrobials.

Low rate of use of biomarkers

- Targeted prescribing may not always be possible in clinically diagnosed severe infections
- Biomarkers may point diagnosis in the direction of bacterial infection and thus justify antimicrobial prescription.
- Low rate of use of biomarkers probably points to
  - a low level of awareness of this procedure
  - Non-availability
  - poor attitude to proper diagnosis of infection as basis for antimicrobial use.

Non-availability of antibiotic guidelines

- further shows the amount of effort required for promoting rational use of antimicrobials in the country
- Every core evidence based strategy for antimicrobial stewardship requires formulation and use of antimicrobial guidelines
- Probably the reason the antibiotics used most commonly are the broad spectrum antibiotics
  - ceftriaxone, ciprofloxacin and amoxicillin, which highly predispose to rapid emergence of antimicrobial resistance

Conclusions

- Need to raise awareness and encourage adequate laboratory diagnosis in the country
  - Discuss importance of targeted prescribing with prescribers
  - This will enable antimicrobial stewardship
- These findings call for increased national awareness for targeted antimicrobial prescribing and use of evidence based antibiotic guidelines

THANK YOU

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