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The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (Global-PPS): Worldwide Variation of Prophylactic Prescribing

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INTRODUCTION AND PURPOSE

The Global-PPS (www.global-pps.com) monitored antimicrobial prescribing and resistance in hospitals worldwide. We analyzed a sub-group of patients who received an antimicrobial for surgical or medical prophylaxis. Main aims were: 1) to determine the worldwide variation in quantity and quality of prophylactic prescribing; 2) to identify targets for quality improvement.

METHODS

A point prevalence survey of antimicrobial prescribing was carried out in February-September 2015 in 335 hospitals in 53 countries of six continental regions, using a standardized and validated method. Data on patients admitted to adult, pediatric & neonatal wards receiving a prophylactic regimen on the day of survey were used. Assessed quality indicators (QI) included choice of antibiotic (for surgical prophylaxis, SP) or antimicrobial (for medical prophylaxis, MP), existence of guidelines and guideline compliance (referring to choice of the drug). Supplementary QI for MP included "documentation of the reason" for MP and whether a "stop/review date was written in the notes". For SP, prolonged antibiotic use was measured.

RESULTS

Top 5 antibiotics for SP were cefazolin, ceftriaxone, cefuroxime, metronidazole which was often administered in combination with various different kind of antimicrobials; and amoxicillin/beta-lactamase inhibitor (Table 1).

SURGICAL PROPHYLAXIS Antimicrobial name (number of antibiotics J01)	North Europe	East Europe	South Europe	West Europe	Africa	Australia & New Zealand	East & South Asia	West & Central Asia	North America	South America	Grand Total
	(n=400)	(n=161)	(n=2125)	(n=1172)	(n=344)	(n=168)	(n=1500)	(n=628)	(n=254)	(n=385)	(n=7137)
Cefazolin	8.3	7.5	18.4	56.4	1.2	64.3	24.3	11.1	59.8	26.5	26.6
Ceftriaxone	1.8	30.4	27.3	0.6	26.7	1.2	5.3	24.4	1.6	11.2	14.2
Cefuroxime	21.3	40.4	5.7	7.8	15.1	1.2	16.7	10.8	0.4	0.5	10.4
Metronidazole	10.8		10.1	4.1	20.6	6.5	9.1	12.3	5.9	13.5	9.4
Amoxicillin/enzyme inh.	22.0	8.1	2.9	11.6	4.9	6.0	2.8	4.9		0.3	5.6
Ciprofloxacin	7.3	1.9	5.2	3.7	10.8		0.9	5.4	5.1	6.5	4.3
Gentamicin	8.8	8.7	8.6	0.3	1.7	3.6	1.4	1.9	1.6	5.7	4.3
Vancomycin	2.0		1.5	1.3		6.0	1.0	1.4	6.3	2.1	1.6
Amoxicillin	2.8	0.6	1.2	0.6	7.6		0.9	1.9		0.3	1.4
Cefalotin				0.3			0.7			14.5	1.0
Cefalexin	0.5		0.8			6.5	1.7	0.3	1.2	0.5	0.9
Teicoplanin	6.0		0.2				0.8	1.3			0.7

Table 1. Prevalence rates of antibiotics (ATC J01) prescribed for surgical prophylaxis worldwide

Most often administered antimicrobials for MP were sulfamethoxazole and trimethoprim, mainly for MP in general without targeting a specific site (MP-Gen) or respiratory MP; fluconazole, mainly for MP-Gen; ceftriaxone for various reasons; ciprofloxacin mainly for urinary MP. Africa most often prescribed metronidazole and Oceania nystatin (Table 2).

MEDICAL PROPHYLAXIS Antimicrobial name (number of antimicrobials)	North Europe	East Europe	South Europe	West Europe	Africa	Australia & New Zealand	East & South Asia	West & Central Asia	North America	South America	Grand Total
	(n=530)	(n=249)	(n=1045)	(n=970)	(n=142)	(n=188)	(n=1293)	(n=251)	(n=314)	(n=223)	(n=5205)
Sulfamethoxazole and trimethoprim	16.2	4.0	9.8	23.5	14.1	33.5	35.0	13.1	17.5	30.5	21.5
Fluconazole	7.9	11.2	8.5	11.0	9.9	2.1	14.7	5.6	15.0	11.2	10.8
Ceftriaxone	0.8	40.2	11.3	0.3	8.5		0.5	13.1	1.3	2.2	5.5
Ciprofloxacin	4.7	7.6	8.2	3.7	4.2	0.5	2.0	2.4	1.0	2.7	4.1
Azithromycin	7.7	0.4	1.6	7.8	2.1	0.5	0.9	6.8	2.5	7.2	3.7
Gentamicin	8.1	1.2	5.6	1.0	5.6		0.8	3.6	7.0	3.1	3.3
Levofloxacin		0.4	3.1	1.9	1.4		5.6	1.2	7.3	0.9	3.0
Ampicillin	0.6	1.6	6.2	0.6			1.6	2.4	7.0	6.7	2.7
Metronidazole	0.8	7.6	4.2	0.4	13.4		0.8	11.6	1.9	2.2	2.7
Nystatin	3.4		1.6	1.0	0.7	26.6	0.7	0.4	5.1		2.3
Amphotericin b	2.1		0.5	5.1		9.6	2.1				2.1
Benzylpenicillin	11.1	1.2	0.6	2.4			0.2		0.6		1.8

Table 2. Prevalence rates of antimicrobials prescribed for medical prophylaxis worldwide

IN GENERAL (updated data as compared to abstract)

Of 48,565 antimicrobials administered to adults, children and neonates worldwide, 25.7% (n=12,464) were administered for prophylaxis among which 81.6% to adults and 18.4% to children/neonates. Out of all prophylactic use, 58.2% of antimicrobials were administered for surgical prophylaxis (n=7259) of which 98.3% were systemic antibiotics (ATC J01). Out of all antimicrobial prescriptions for medical prophylaxis (n=5205); 73.9% were antibiotics and 18.4% antifungals for systemic use.

Table 3. Quality indicators for SP (only antibiotics are considered) and MP (all antimicrobials)

Quality indicator	North Europe	East Europe	South Europe	West Europe	Africa	Australia & New Zealand	East & South Asia	West & Central Asia	North America	South America	Grand Total
	(n=935)	(n=423)	(n=3192)	(n=2150)	(n=544)	(n=356)	(n=2800)	(n=885)	(n=569)	(n=610)	(n=12464)
Surgical prophylaxis											
No guideline existing	8.4	37.9	40.5	6.5	22.4	8.3	26.7	32.5	8.6	10.3	25.1
Guideline compliant (yes)	77.9	94.4	57.2	71.5	81.1	55.2	72.4	61.0	77.9	48.4	67.3
Medical prophylaxis											
No guideline existing	20.6	32.5	29.4	16.3	39.4	25.0	28.7	40.2	11.1	14.8	24.9
Guideline compliant (yes)	98.1	80.4	85.1	88.3	65.5	94.9	90.1	58.5	93.2	87.2	88.0
Reason in notes (yes)	80.2	57.8	66.4	62.6	63.4	70.2	47.2	54.6	73.9	80.7	62.5
Stop/review date documented	41.7	47.4	33.7	26.8	18.3	12.2	24.4	16.3	24.2	35.9	29.1

Quality Indicators

SP was predominantly administered for more than one day in African, Asian, South American and European hospitals (Figure 1).

In general, for SP and MP, guidelines were most often missing in Africa, Asia and East- & South Europe. Guideline compliance was remarkable lower when prescribed for surgical prophylaxis. The rate of documenting a stop/review date for MP is low worldwide (Table 3).

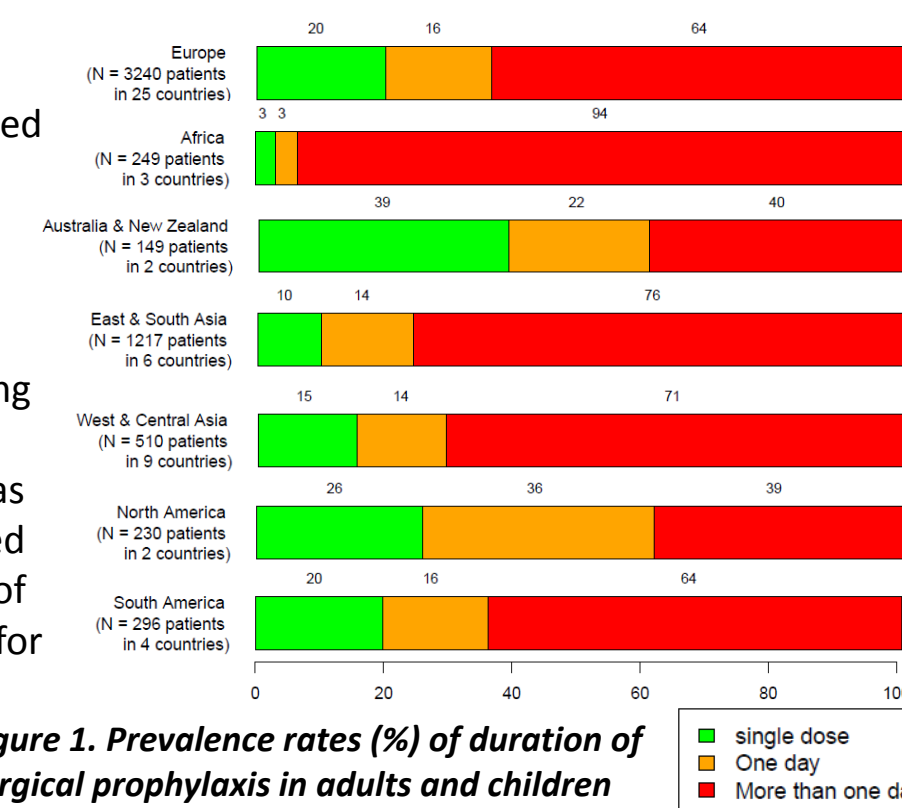


Figure 1. Prevalence rates (%) of duration of surgical prophylaxis in adults and children

CONCLUSION

Various prophylactic prescription practices were observed worldwide. We identified five quality indicators: 1) surgical prophylaxis with broad spectrum antibiotics, 2) prolonged surgical prophylaxis, 3) missing guidelines for SP and MP, 4) failure to prescribe according to local guidelines and 5) failure to document a stop/review data for medical prophylaxis.

Disclosures: "bioMérieux is the sole sponsor of the GLOBAL Point Prevalence Survey. The funder has no role in study design, data collection, data analysis, data interpretation, or writing the report. Data are strictly confidential and stored anonymous at the coordinating centre of the University of Antwerp."