SUSCEPTIBILITY PATTERNS AND CLINICAL MANAGEMENT OF HOSPITALISED CHILDREN WITH URINARY TRACT INFECTIONS IN CENTRAL GREECE

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BACKGROUND

- There is limited evidence on paediatric UTIs prescribing in Greece
- The high antimicrobial resistance (AMR) rates and inappropriate antibiotic prescribing are posing an increasing threat to public health in Greece

AIMS

Retrospective cohort study aiming to:

- describe antibiotic prescribing patterns
- evaluate resistant rates in hospitalised children with febrile and afebrile UTIs in a district hospital in central Greece

Table 1: Demographics

Demographics	All UTIs (n=230)	Febrile UTIs (n=181)	Afebrile UTIs (n=49)	p-value
Age (on admission)				
<29days	15 (6.5%)	12 (6.6%)	3 (6.1%)	0.07
1month – <2 years	138 (60.0%)	116 (64.1%)	22 (44.9%)	
2 years – <5 years	37 (16.1%)	25 (13.8%)	12 (24.5%)	
≥5 years	40 (17.4%)	28 (15.5%)	12 (24.5%)	
Sex				
Male	64 (27.8%)	49 (27.1%)	15 (30.6%)	0.72
Female	166 (72.2%)	132 (72.9%)	34 (69.4%)	
Background				
Previously healthy children	181 (78.7%)	141 (77.9%)	40 (81.6%)	0.70
UT-abnormalities ^a	25 (10.9%)	24 (13.3%)	2 (0.04%)	0.08
Other medical conditions ^b	24 (10.4%)	17 (9.4%)	7 (0.14%)	0.30
Concurrent infections	11 (4.8%)	11 (6.1%)	0 (0.0%)	0.13
Bacteraemic UTIs	6 (2.6%)	6 (3.3%)	0 (0.0%)	0.35
Recurrent UTIs	40 (17.4%)	35 (19.3%)	5 (0.1%)	0.20
Atypical UTIs	96 (41.7%)	78 (43.1%)	18 (36.7%)	0.74
Recent hospitalisation	10 (4.3%)	8 (4.4%)	2 (0.04%)	1
Recent/concurrent antibiotics use	29 (12.6%)	27 (14.9%)	2 (0.04%)	0.05
Pathogens				
<i>E. coli</i>	187 (79.2%)	153 (81.8%)	34 (69.4%)	0.07
<i>Klebsiella sp</i>	17 (7.2%)	14 (7.5%)	3 (6.1%)	1.00
<i>Proteus sp</i>	12 (5.1%)	8 (4.3%)	6 (12.2%)	0.05
<i>Pseudomonas aeruginosa</i>	11 (4.7%)	6 (3.2%)	3 (6.1%)	0.40
<i>Enterobacter sp</i>	4 (1.7%)	2 (1.1%)	2 (4.1%)	0.19
<i>Citrobacter sp</i>	1 (0.4%)	1 (0.5%)	0 (0.0%)	1
Gram (+) cocci ^c	4 (1.7%)	3 (1.6%)	1 (2.1%)	1
Total	236 (100%)	187 (100%)	49 (100%)	-

METHODS

- Study period: August 2010 to September 2016
- Included children 0-17 years old
- Patients records retrieved using ICD-10 codes
- Data was collected on antibiograms and antibiotic prescriptions
- Patients were included based on clinical and microbiological criteria
- Sensitivity to antimicrobials was determined using the Kirby-Bauer disk diffusion method

Table 2. Antibiotic prescriptions for febrile and afebrile UTIs treatment

Antibiotic	No of hospital prescriptions	<29 days	1m- 2y	2y-5y	5y-18y	Treatment duration in days (Mean; SD)
fUTIs	n=378					
Amikacin	124 (32.8%)	10	82	14	18	(4.4; 1.9)
AMC	63 (16.7%)	1	45	10	7	(5.8; 2.1)
Ampicillin	53 (14.0%)	10	37	4	2	(3.9; 2.7)
Cefotaxime	42 (11.1%)	8	25	5	4	(6.7; 2.7)
SAM	34 (9.0%)		21	4	9	(4.8; 1.7)
Cefuroxime	25 (6.6%)		14	3	8	(4.3; 1.9)
Ceftriaxone	17 (4.5%)		10	4	3	(8.4; 2.2)
TAZ	7 (1.9%)	1	5		1	(7.4; 4)
Ceftazidime	3 (0.8%)		2		1	6.7
Cefoxitin	2 (0.5%)		2			3.7
TMP/SMZ	2 (0.5%)		2			-
Other	6 (1.8%)	1	4		1	-
aUTIs	n=81					
Amikacin	19 (23.5%)	3	14	1	1	(5; 2.5)
AMC	17 (21.0%)	1	12	1	3	(4; 2.3)
Cefuroxime	13 (16.0%)		7	3	3	(3.6; 1.6)
Ampicillin	9 (11.1%)	2	6		1	(4.9; 4)
SAM	5 (6.2%)		2	2	1	(3.4; 1.5)
Cefprozil	4 (4.9%)			2	2	(1.3; 0.3)
TAZ	3 (3.7%)		2		1	(7.7; 0.3)
Cefaclor	3 (3.7%)			2	1	
Cefotaxime	3 (3.7%)	1	2			(7.7; 2.5)
Other	5 (6.1%)		3	1	1	

Abbreviations: SAM, ampicillin-sulbactam; AMC, amoxicillin-clavulanic acid; TLV, ticarcillin-clavulanic acid; TAZ, piperacillin-tazobactam; TMP/SMZ, trimethoprim-sulfamethoxazole

RESULTS

- Two hundred thirty patients were included
- Among 459 prescriptions identified, amikacin (31.2%) was the most commonly antibiotic prescribed in this population (Table 2)
- The following most common antibiotics were amoxicillin-clavulanic acid (17.4%) and ampicillin (13.5%) (Table 2)
- Children received prolonged intravenous treatments for febrile (5.4 days; SD 1.45) and afebrile UTIs (4.7 days; SD 1.34)
- Two-hundred thirty-six pathogens isolated (Table 1)
- The main causative organism was *Escherichia coli* (79.2%) with high reported resistance rates to ampicillin (42.0%), trimethoprim-sulfamethoxazole (26.5%) and amoxicillin/clavulanic acid (12.2%)
- Lower resistance rates of *E. coli* to 3rd generation cephalosporins (1.7%), nitrofurantoin (2.3%), ciprofloxacin (1.3%) and amikacin (0.9%)
- Klebsiella spp.* isolates were highly resistant to cefaclor (27.3%)

CONCLUSION

- UTIs is a key area to monitor antimicrobial resistance in childhood
- The establishment of antimicrobial stewardship programs could help to minimise inappropriate prescribing for UTIs in Greek hospitals

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