VARIABILITY IN EMPIRIC ANTIBACTERIAL AND ANTIFUNGAL USE INPEDIATRIC ONCOLOGY PATIENTS WITH FEBRILE NEUTROPENIA

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BACKGROUND Fever and neutropenia (FN) is a **common complication** in children who receive chemotherapy for cancer and hematopoietic stem-cell transplantation recipients and is associated with **high morbidity and mortality**. Proper initiation of empiric treatment can be crucial to a favorable outcome. The aim of this study was to **evaluate the empiric antimicrobial use in these patients in order to identify possible targets for antibiotic stewardship**.

METHODS A prospective study was conducted in 5 public pediatric oncology units in Greece (9/2016-6/2017).

Data collected: demographic, clinical, laboratory, and use of antibacterial and antifungal antibiotics. The first antibiotic initiations for up to 15 unique patients were recorded each month and patients were followed for 7 days. Episodes with FN were extracted.

Fever was defined as a recorded axillary temperature of $\geq 37.5^{\circ}\text{C}$ and neutropenia as absolute neutrophil count (ANC) $\leq 500\text{cells}/\mu\text{L}$ (recorded or expected by the physician). Empiric antibiotic use on the first day and antifungal use within the first 4 days was analyzed.

Most common pathogens isolated from blood cultures were identified.

RESULTS

Among **258 FN** episodes, initial empiric therapy was monotherapy in 50 cases (19.3%). In 34% of all FN cases an antipseudomonal b-lactam with a second gram-negative agent and a glycopeptide was administered. There was variability in antibiotic and antifungal use among the units (Table 1).

45.7% of the cases received **at least 1 antifungal agent** within the first 4 days of the course.

The median rate of de-escalation/discontinuation of antibiotic therapy on the 6th day in cases with negative cultures was 27.8% (IQR: 5.3%-46.9%)

Most frequently used antifungals the first four days of the course were fluconazole, micafungin and voriconazole (Figure 1)

Most common pathogens isolated from blood cultures are Coagulase negative Staphylococci (CoNS), E. coli and Pseudomonas aeruginosa (Figure 2)

Figure 1: Frequency of antifungals used (day1-day 4) in pediatric oncology patients with FN

Figure 2: Pathogens isolated from blood cultures in pediatric oncology patients with FN

Table 1 : Antibacterial and antifungal use in pediatric oncology patients with Fever and Neutropenia

	UNIT 1		UNIT 2		UNIT 3		UNIT 4		UNIT 5		ALL UNITS
A. EVALUATION OF EMPIRIC TREATMENT FOR FEVER AND NEUTROPENIA	(n=32)	%	(n=65)	%	(n=41)	%	(n=72)	%	(n=48)	%	MEDIAN (IQR)
1. Monotherapy with antipseudomonal b-lactam*	0	0.0%	4	6.2%	36	87.8%	6	8.3%	4	8.7%	8.3% (6.2%-8.7%)
2. Antipseudomonal b-lactam* AND 2nd gram negative agent~	0	0.0%	0	0.0%	0	0.0%	39	54.2%	3	15.2%	0.0% (0.0%-15.2%)
3. Antipseudomonal b-lactam AND glycopeptide	0	0.0%	17	26.2%	4	9.8%	7	9.7%	6	6.5%	9.7% (6.5%-9.8%)
4. Antipseudomonal b-lactam AND 2nd gram negative agent~ AND glycopeptide	22	68.8%	38	58.5%	1	2.4%	13	18.1%	14	30.4%	30.4% (18.1%-58.5%)
Other combinations	10	31.3%	6	9.2%	0	0.0%	7	9.7%	19	39.1%	9.7% (9.2%-31.3%)
B. ANTIFUNGALS (DAY1-DAY4)											
Amphotericin B	0	0.0%	7	10.8%	1	2.4%	1	1.4%	3	6.3%	2.4% (1.4%-6.3%)
Caspofungin	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	14.6%	0.0% (0.0%-0.0%)
Fluconazole	1	3.1%	1	1.5%	33	80.5%	8	11.1%	0	0.0%	3.1% (1.5%-11.1%)
Micafungin	0	0.0%	10	15.4%	5	12.2%	1	1.4%	18	37.5%	12.2% (1.4%-15.4%)
Posaconazole	0	0.0%	0	0.0%	1	2.4%	1	1.4%	0	0.0%	0.0% (0.0%-1.4%)
Voriconazole	21	65.6%	3	4.6%	1	2.4%	0	0.0%	3	6.3%	4.6% (2.4%-6.3%)
At least one antifungal	22	68.8%	20	30.8%	40	97.6%	11	15.3%	25	52.1%	52.1% (30.8%-68.8%)
C. IN CASES A1,A2,A3 WITH NEGATIVE CULTURES											
Deescalation/Discontinuation of antibiotic therapy on day 6	1	5.3%	28	66.70%	0	0%	23	47%	5	27.80%	27.8% (5.3%-46.9%)

*excluding ceftazidime due to its poor activity against gram positive organisms
~ gentamycin, amikacin, tobramycin, colistin, tigecycline

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