ETIOLOGY OF ACUTE PYELONEPHRITIS AND ANTIBACTERIAL RESISTANCE IN PEDIATRIC MALE AND FEMALE PATIENTS

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Table 1. Number of male and female patients included in the study, with obtained urine culture and with positive urine culture and median age for both sexes.

	Male	Female	p
Number of patients, % (n)	29 (221)	71 (546)	
Age, months (IQR)	5 (2 – 18)	49 (12 – 103)	p<0.001
Urine culture obtained, % (n)	71 (157)	58 (317)	p=0.001
Positive urine culture, % (n)	76 (120)	75 (236)	p=0.735

Data are presented as median and IQR unless indicated otherwise by % (n).
IQR – interquartile range, n – number of patients.

Background and Aims

Acute pyelonephritis (AP) is common in childhood and the choice of empiric therapy should be based on the local antibacterial resistance (AR), which might differ between sexes.

The aim of our study was to determine the most common etiological agents of AP and their AR in paediatric population.

Method

A retrospective study was performed to determine the differences between etiological agents of AP in male and female patients and their AR to cefuroxime, nitrofurantoin and cefotaxime. Extended-spectrum beta-lactamases (ESBL) producing agents were also analysed. Medical histories of 769 inpatients with diagnosis of AP or exacerbation of chronic pyelonephritis during a 4-year period (2013 – 2016) were studied.

Results

29% (n=221) of the patients were male. In 46% (n=356) the diagnosis was confirmed with a positive urine culture (PUC) (table 1.). The isolated agents from PUCs were *E. coli* in 54% (n=65) and 85% (n=201), other single agents in 22% (n=26) and 9% (n=20), and multiple agents in 24% (n=29) and 6% (n=15) male and female patients respectively, p<0,001 (figure 1. and 2.). AR to cefuroxime, nitrofurantoin and cefotaxime, when determined (table 2.), was 17% (n=12), 14% (n=16) and 16% (n=15) respectively in male patients and 4% (n=6), 5% (n=11) and 4% (n=8) in female patients, p=0,002 (for difference between sexes). ESBL production was determined in 294 PUCs and was positive in 14% (n=13) and 3% (n=6) of cases in male and female patients respectively, p<0,001 (figure 3.).

Conclusion

The aetiology of AP differs in male and female patients. The AR to cefuroxime, nitrofurantoin and cefotaxime is higher in males. ESBL producing agents are more common in males.

Abbreviations

AP – acute pyelonephritis
AR – antibacterial resistance
ESBL – extended spectrum beta- lactamase
IQR – interquartile range
PUC – positive urine culture

Figure 1. ETIOLOGY OF ACUTE PYELONEPHRITIS IN PEDIATRIC MALE PATIENTS

Figure 2. ETIOLOGY OF ACUTE PYELONEPHRITIS IN PEDIATRIC FEMALE PATIENTS

Figure 3. Antibacterial resistance to cefuroxime, nitrofurantoin and cefotaxime and ESBL production in male and female patients

Table 2. Number of male and female patients in which the specific antibacterial resistance was determined.

Antibiotic	Male	Female
Cefuroxime, n	72	148
Nitrofurantoin, n	112	228
Cefotaxime, n	96	216
ESBL positive, n	93	201

ESBL – extended spectrum beta-lactamase