Comparative analysis of microbiological spectrum from urine culture of patients with acute pyelonephritis using standard and extended microbiological examinations

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Introduction. Role of other microorganisms, than Enterobacteria in acute obstructive pyelonephritis development is debated or ignored. For the first time we showed the causative role of peptococcus in experimental model of acute obstructive pyelonephritis (Eur Urol Suppl 2011; 10(2):162).

Materials and methods. Bacteriological urine analysis in 33 female with acute obstructive pyelonephritis (AOP) (mean age was 25.4±2.2) prior to starting of antibacterial treatment was performed. Obstruction was due to stones (60.6%) and ureteropelvic junction obstruction (39.6%). The duration of the disease was 3.0±2.0 days. Bacteriological urine analysis using standard and extended amount of the 9 mediums (Mac Conkey, HiCrome Candida Differential Agar, HiCrome Enterococcus Agar, HiCrome Aureus Agar Base, blood agar, made on the basis of Mueller Hinton Agar with addition of sheep erythrocytes) was performed. For nonclostridial anaerobes isolation medium Blaurokka, Shaedler Agar and broth, Bacteroides Bile Esculinum Agar were used.

Results. Using the standard mediums we isolated 57 types of microorganisms in urine, while using extended amount of mediums we determined 135 types ($p<0.05$) (table.1). In all cases of AOP the extended microbiological studies detected mixed bacterial infection with predominance of Enterobacteria/CNS combination and/or other gram-positive bacteria combined with nonclostridial anaerobes (45.6%). In 33.4% cases combination of Enterobacteria and nonclostridial anaerobes was detected, while in 18% patients association of nonclostridial anaerobes, Candida sp., and CNS and/or another types of gram-positive bacteria was found. Conversely, in cases with using of the standard medium the mixed infection was seen only in 57.5% cases. The mean bacteriuria levels, determined by extended microbiological studies were 10^5CFU/ml and 10^6CFU/ml for aerobes and nonclostridial anaerobes, respectively.

Conclusion. Using the **s**tandard mediums we can determine only limited microorganism spectrum, which compromise 42.2% of microorganisms, detected using extended analysis. Enterobacteria and nonclostridial anaerobes dominate in urine in patients with AOP. In all cases we isolated from 1 to 3 types of nonclostridial anaerobes using urine bacteriology. In 24.4% patients Candida sp. was detected in urine and its role in AOP pathogenesis is underestimated. Cause of inflammatory process in mixed infection remains unknown and, also, whether AOP can be caused by microbiological association or not.

Table 1.

Microorganisms	Types of microorganisms (%)	
	Standard mediums	Extended mediums
Enterobacteriaceae	78.6	78.6
Coagulase-negative staphylococcus (CNS)	39.3	51.4
Corynebacterium sp.	24.2	36.4
E.faecalis	12.1	18.2
S.aureus	9.0	9.0
C.albicans	9.0	12.1
C.krusei	0	9.0
C.tropicalis	0	3.0
Nonclostridial anaerobic bacteria	0	100.0