

## BACKGROUND

- Urine culture is the gold standard for the diagnosis of urinary tract infections (UTI). The implementation of flow cytometry (FC) before the culture allows the automation in quantification and recognition of cell components.
- This screening method could lead to a reduction in the number of cultured urines, a faster report of negative results as well as the possibility to relate the data obtained with cultured uropathogens in specimens from patients with a suspected UTI.



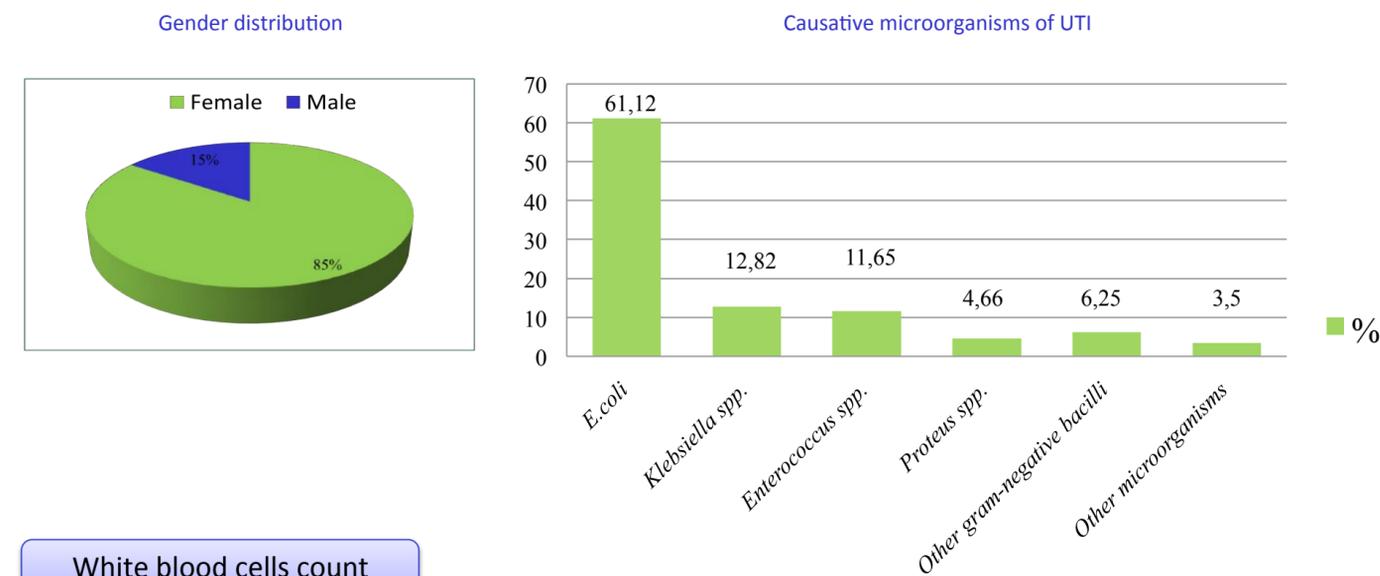
## MATERIAL AND METHODS

- A retrospective study was performed with urine samples that were sent to the Microbiology Laboratory from June 2015 to July 2015. All samples were analyzed by Sysmex UF-1000i FC and those having criteria for their culture (> 25 leucocytes/microlitre or > 100 bacteria/microlitre) were processed by quantitative urine culture on CPSE agar. The urine was considered contaminated if ≥ 2 different species were isolated.
- The measured variables were age, gender, number of red blood cells (RBC), white blood cells (WBC), epithelial cells (EC) and isolated microorganisms.

## RESULTS

MEDIAN (RANGE)			
	WBC (cells/μl)	RBC (cells/μl)	EC (cells/μl)
<i>E.coli</i>	57.1 (0.2-4997.6)	13.4 (0.2-4075.8)	4.5 (0.0-126.6)
<i>Klebsiella spp.</i>	80.5 (0.5-3121.0)	16.8 (0.5-467.4)	4.1 (0.0-65.7)
<i>Enterococcus spp.</i>	16.2 (0.4-14869.8)	14.3 (1.0-515.0)	6.7 (0.1-157.0)
<i>Proteus spp.</i>	63.6 (1.3-1812.0)	11.7 (1.6-1962.9)	8.3 (0.1-123.5)
Other gram-negative bacilli	44.1 (1.2-25240)	12.7 (0.5-755.2)	3.2 (0.0-33.4)
Other microorganisms	75.3 (0.3-2799.7)	22.4 (3.2-571.9)	5.4 (0.1-259.2)
Contaminated urine	14.5 (0.1-9250.6)	16.4 (0.2-3585.1)	8.5 (0.0-519.0)
Negative urine	24.8 (0.1-6372.9)	17.6 (0.2-11486.4)	12.3 (0.0-962.7)

- 4961 samples were processed by flow cytometry, 2918 of which had criteria for culture. The reduction in the number of cultured urines was 41.18%.



### White blood cells count

- Negative urines cultures were significantly associated with less WBC count than samples with *Escherichia coli* ( $p < 0.001$ ), *Klebsiella spp.* ( $p < 0.001$ ) and *Proteus spp.* ( $p < 0.001$ ), but not *Enterococcus spp.* ( $p = 0.07$ ).
- Contaminated urines had significantly lower leucocyte counts than those with *E.coli* ( $p < 0.001$ ), *Klebsiella spp.* ( $p < 0.001$ ) and *Proteus spp.* ( $p < 0.001$ ), but no differences were found with *Enterococcus spp.* ( $p = 0.729$ ).

### Epithelial cells count

- Negative urines cultures had significantly more EC count than all positive samples ( $p < 0.05$ ).
- Contaminated urines were associated with more EC count than *E. coli* and *Klebsiella spp.* ( $p < 0.001$  for both), but not with *Enterococcus spp.* ( $p = 0.164$ ) and *Proteus spp.* ( $p = 0.865$ ).

## CONCLUSIONS

- The use of the UF-1000i flow cytometry for screening of urine samples allows to a reduction in the number of cultured urines.
- White blood cells number correlated well with most significant isolates.
- The obtained results for *Enterococcus spp.* suggest a low significance of these isolates as cause of UTI.