IL-8 Antibacterial Innate Immunity in Iraqi Women with Urinary Tract Infections

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Dear Editor

Urinary tract infections (UTIs) are among the greatest public infectious illnesses of humans.[1] The possibility of women experiencing a UTI in their lifespan has been estimated to be over 50%, with approximately 25% experiencing a recurrence.[2] Innate immunity of which interleukin (IL)-8 is significant fundamentals acting a crucial part in the progress of UTI. The personality's reply to UTI is inconstant and the vulnerability to the infection is hereditary.[3]

The aim of this study was to investigate whether there is a correlation between IL-8 serum levels, its receptor polymorphisms, urinary infection vulnerability, and bacterial clearance among Iraqi women.

One hundred and twenty participants were participated in this 1:1 case–control study. Sixty female patients who suffered from UTI were identified at the outpatient clinic of urology in Al-Hilla General Teaching Hospital for the period from May 2019 to March 2020. We performed a cross-sectional study for the bacteriological evaluation among UTI women. Sixty apparently healthy individuals were included as controls and intentionally matched with patients in terms of age, gender, and geographical location.

Table 1: Bacterial species and yeast isolated from urine specimens

Bacterial species	No. of isolates	%
Enterobacteriacae		
Escherichia coli	25	49
Klebsiella spp.	8	16
Proteus coli	3	6
Enterobacter spp.	2	4
Pseudomonas spp.	8	15.3
Gram-positive cocci	4	7.7
Yeast	1	2
Total number of isolates	52	100

Serum samples were obtained for detecting IL-8 using the Elabscience company's enzyme immunoassay Kit which provided materials for the quantitative determination of IL-8 in serum through sandwich enzyme-linked immunosorbent assay (ELISA) (as recommended by the manufacturer company).

The differences in allele and genotype distribution between patients and controls were made fit to Hardy–Weinberg equilibrium then examined by Fisher's exact test.

A cross-sectional methodology was adopted in this study to evaluate the bacterial and yeast uropathogens; case–control study design was used to examine whether IL-8 serum level were associated with UTI among Iraqi women.

A total of 60 urine specimens were collected for culturing from women patients who were admitted to the out-patients clinic of urology in Al-Hilla General Teaching Hospital for the period from May 2019 to March 2020. Only 52 (86.7%) specimens gave positive bacterial growth, there were 38 (73%) isolates belonged to members of the family Enterobacteriaceae. The remaining 14 isolates were identified as nine *Pseudomonas aeruginosa* (15.4%), four isolates of Gram-positive cocci (7.7%), and only one yeast isolate (2%) as displayed in Table 1.

Results showed elevated mean serum value of IL-8 among patients and a highly significant difference between patients and control in this study as presented in Table 2.

Innate immunity switches the resistance to UTI and neutrophils are required for bacterial clearance from diseased tissues. Neutrophil recruitment is motivated by IL-8 and other chemotactic factors. These results are confirmed by Duell *et al*.[1] has have endorsed that *Escherichia coli* expresses numerous adhesins and virulence factors that aggravate infection as the first step in UTI pathogenesis. It may also overwhelm innate immune reactions and prompts inflammation that comprises of immune mediators, including IL-8.[1,4,5]

Table 2: Serum levels of IL-8 among UTI patients and healthy controls

Variable	Patients	Healthy control	*P* value
Serum IL-8 (pg/ml) Mean ± SD	**28.3 ± 22.3**	**7.5 ± 3.2**	**<0.001 HS**

HS: highly sensitive, IL: interleukin, SD: standard deviation, UTI: urinary tract infection

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Serologically, we evaluated the level of IL-8 and it was found to be significantly elevated in the sera of patients with UTI when compared to healthy control group in this study [Table 2]. We explained these results as IL-8 is manufactured locally in the urinary tract as an innate immunity molecule; subsequently, serum IL-8 levels were greater among UTI women patients studied. These results were supported by previous studies pointing out that IL-8 also activates neutrophils in relations of respiratory burst, enzyme discharge, superior activity, and phagocytosis, which are all crucial in antimicrobial purposes.[6,7]

Similarly, Mahyar *et al.*[8] indicated that there was a significant affirmative correlation between UTI among adults and serum levels of IL-8 recommending it as an appropriate indicator for the diagnosis of UTI especially acute pyelonephritis.[2,8]

For unidentified causes, urinary infections occur in specific individuals. Acute pyelonephritis are extra predominant in female relatives with recurrent UTIs, indicating a familial hereditary predisposition to UTI. The inter-individual inconsistency in cellular response may be in charge for inconsistent clinical consequences and could explain why certain individuals are prone to recurring infections.[3]

The pathophysiological aspect of predisposition to frequent UTIs needs to be fully illuminated, in view of that several concerns. Further research in this field could be beneficial and is recommended to prompt characterization of women who are susceptible to recurrent UTI.

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Conflicts of interest
There are no conflicts of interest.

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References

1. Duell BL, Carey AJ, Tan CK, Cui X, Webb RI, Totsika M, *et al*. Innate transcriptional networks activated in bladder in response to uropathogenic *Escherichia coli* drive diverse biological pathways and rapid synthesis of IL-10 for defense against bacterial urinary tract infection. J Immunol 2012;188:781-92.
2. Choe HS, Lee SJ, Cho YH, Çek M, Tandoğdu Z, Wagenlehner F, *et al*; GPIU Asian Investigators. Aspects of urinary tract infections and antimicrobial resistance in hospitalized urology patients in Asia: 10-year results of the Global Prevalence Study of Infections in Urology (GPIU). J Infect Chemother 2018;24:278-83.
3. Ching C, Schwartz L, Spencer JD, Becknell B. Innate immunity and urinary tract infection. Pediatr Nephrol 2020;35:1183-92.
4. Kline KA, Schwartz DJ, Lewis WG, Hultgren SJ, Lewis AL. Immune activation and suppression by group B Streptococcus in a murine model of urinary tract infection. Infect Immun 2011;79:3588-95.
5. Foxman B. Urinary tract infection syndromes: Occurrence, recurrence, bacteriology, risk factors, and disease burden. Infect Dis Clin North Am 2014;28:1-13.
6. Bitsori M, Karatzi M, Dimitriou H, Christakou E, Savvidou A, Galanakis E. Urine IL-8 concentrations in infectious and non-infectious urinary tract conditions. Pediatr Nephrol 2011;26:2003-7.
7. Kjölvmark C, Akesson P, Linder A. Elevated urine levels of heparin-binding protein in children with urinary tract infection. Pediatr Nephrol 2012;27:1301-8.
8. Mahyar A, Ayazi P, Hadi Yarigarravesh M, *et al*. Serum interleukin -8 is not a reliable marker for prediction of vesicoureteral reflux in children with febrile urinary tract infection. Int Braz J Urol 2015;41:1160-66.

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