History of Medicine, 2023, 9(1): 990–993
DOI: 10.17720/2409-5834.v9.1.2023.115

Megrment the level of IL-8 in the Blood of Patients with Urinary tract infection in Iraq-Babil City

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Received: 20 January 2023 **Accepted:** 15 April 2023

Citation: Ali AA, Ibrahim HH (2023) Megrment the level of IL-8 in the Blood of Patients with Urinary tract infection in Iraq-Babil City. History of Medicine 9(1): 990−993. https://doi.org/10.17720/2409-5834.v9.1.2023.115

Abstract

Urinary tract infection, as one of the global threats affecting millions of women and causing some time deaths around the world. Objective: This study aims to assess levels of IL-8 in patients with Urinary tract infections, and people enjoying good health as a control group. Methods: Collecting medical information from (120) participants in the Imam Al-Sadiq General Teaching Hospital in Iraq-Babylon, the Gynecology Consultant, according to specific criteria, the subjects were divided into 2 groups: the control group, the patients (UTI), while the demographic study included age, education, Jobs, and living Laboratory results, IL-8 levels were assessed by the enzyme-linked immunosorbent assay (ELISA) technique. Results: The results revealed that there were significant variations in IL-8 between the UTI group and control groups. IL-8 level with the UTI group was (16.640953±1.6832825 pg/ml) whereas the control group appear was (13.338285±1.6033101 pg/ml), Conclusion: They can be considered good indicators to give knowledge about the diagnosis of urinary tract infection and help doctors to give appropriate medications.

Keywords
UTI, IL-8, Elisa

Urinary tract infections(UTIs) are bacterial infections of the urinary tract and can involve both the lower (cystitis) and upper (pyelonephritis). UTI occurs in females of any age, with the highest prevalence in pregnant and postmenopausal patients.(Czajkowski et al., 2021),(Almukhtar, 2019).

Women experience lower UTIs (Urethral, Bladder infection) much more frequently than men do. The main reason for this is anatomical variations. In most cases, UTIs begin with per urethral contamination by a uropathogenic living in the gut, followed by urethral colonization and, lastly, pathogen migration to the bladder or kidney. When effective host defense mechanisms are defeated by bacterial virulence mechanisms, infections develop. When uropathogenic organisms climb to the kidneys via the ureters, upper UTIs (Kidney infections) result. (Consequences et al., 2013). (Beahm et al., 2017),(Geerlings, 2016) .

Gram -ve and Gram +ve bacteria, as well as some fungi, are responsible for UTIs. Uropathogenic E. coli is the most frequent cause of UTIs. (Totsika et al., 2012).

UTIs are classified based on (Level of Complicated, Site and Type of Infection, Symptoms of UTI) and the nature of the occurrence. (Smelov et al., 2016),(Gajdбcs et al., 2021) ,(Isaacson et al., 2017)

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UTI trigger an exciting protective immunity that is in charge of bacterial clearance that is quick and efficient. Interleukin 8 (IL-8) is a potent chemo- attractant and activator and attracts neutrophils, basophils, and T-cells during the inflammatory process / site of infection. IL-8 is released from several cell types in response to inflammation, including monocytes, macrophages, neutrophils, (Qazi et al., 2011), (Cesta et al., 2022), (Abbas et al., 2022).

Material and methods

Study Design

A group comparison study design was used, started in September 2022 with 120 participants divided into 2 groups (60 women with UTI and 60 women healthy) participants from the Imam Al-Sadiq General Teaching Hospital/ Gynecology Consultant/Babylon /Iraq, the three groups' demographic research criteria were taken (age(15-50Years), education, job, living, and laboratory tests.

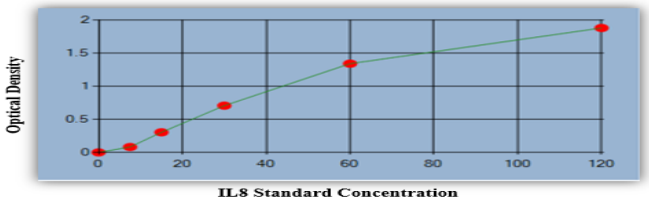
Control and Patients

Patients with urinary tract infection were identified by a specialist in gynecology, according to the patient's signs and symptoms according to the laboratory tests evaluated. The Control group of women who participated in this study matched with patients in age, education, job, living, and laboratory tests, all women in the control groups were checked for signs and symptoms and laboratory tests and were within the normal range and apparently healthy. The medical information was gathered in Imam Al-Sadiq General Teaching Hospital/ Gynecology Consultant/Babylon /Iraq.

Samples Collection and ELISA Assay

Blood collection from the vein of approximately (5ml) was obtained from patients and control, let clotting for 15 minutes and centrifugation at (3000xg) for10 minutes to obtain serum stored at -20ºC. Determination of Interleukin 8 Levels by ELISA kit supplied from Melsin Medical Co. applied to the in vitro quantitative determination of IL-8 in serum. This ELISA kit used the Sandwich - ELISA principle at 450 nm.

The standard curve for IL-8 using the ELISA technique (Figures1-1)



ABS	0.000	0.082	0.304	0.706	1.340	1.879
Con.	0.000	7.500	15.000	30.000	60.000	120.000

Correlation coefficient(R2) =0.999

Figure (1-1): Standard Curve for IL-8

Statistical Analysis:

All statistical analyses were performed using software package version 28 (SPSS) data were presented as (mean + standard deviation) with 95% confidence intervals.

Results and Discussions

The medical information (Table 3-1) was collected for the patients and control including:

Table (3-1) medical information

N=60 each group		UTI		Control		Sig.
Mean± Std.		30.433±9.59		34.100±10.50		*P.value
		Freq.	Perc.	Freq.	Perc.	
Age groups	15-25 Y	21	35.0	19	31.7	0.08
	26-36 Y	21	35.0	15	25.0	
	37-47Y	14	23.3	16	26.7	
	48-58 Y	4	6.7	10	16.7	
Education levels	Elementary	8	13.3	9	15.0	**0.001
	Intermediate	14	23.3	19	31.7	
	Academic	11	18.3	13	21.7	
	Institute	9	15.0	7	11.7	
	College	18	30.0	10	16.7	
	Master/PhD	0	0	2	3.3	
Job	Employee	20	33.3	25	41.7	**0.042
	Student	22	36.7	14	23.3	
	Housewife	18	30.0	21	35.0	
Living	Urban	29	48.3	37	61.7	**0.001
	Rural	31	51.7	23	38.3	

*One-way ANOVA significant at 0.05.

****Freidman significant at 0.005, UTI = Urinary Tract Infection, Sig = Significant.**

The distribution of patients according to 10 years' intervals was shown in table (3-1). It was obvious that the majority of UTI patients were in the age groups (15-25-26-36) years accounting for (35.0% for 15-25 years and,35.0% for 26-36 years), in control subjects the highest rate with (15-25) years, this may be attributable to the fact that the age of onset of UTI, usually in young women, caused by frequent or recent sexual intercourse (increased sexual activity) is a major risk factor,(Dubois et al., 2017) For UTI ,According to the educational levels, for the UTI group, most of the had a college level (30%), and for the control group, most of them had intermediate level (31.7%),(Lelie-van der Zande et al., 2021). For the jobs, for the UTI group, most of them were students (36.7%), Finally, 41% of the control were employees (Javaheri Tehrani et al., 2014).

For the living area, 51.7% of the UTI group was living in a rural area and control were living in urban areas respectively.

Interleukin 8

Table (3-2) IL8 comparison among study groups

Groups	No.	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	*P.value
UTI	60	16.640953	1.6832825	.2173108	16.206115	17.075791	0.001
Control	60	13.338285	1.6033101	.2069864	12.924106	13.752464	

Confidence Interval 95%

*One-way ANOVA, significant at 0.05

the comparison among means reveals that there is highly statistically significant difference between them (0.001). The study's findings of women with UTI have elevation of IL8 (16.640953 ±1.6832825pg/ml) compared with those in controls group (13.338285 ±1.6033101 pg/ml).

this result similar to previous studies that says the amount of serum IL-8 were expressively high in women with UTI compared to uninfected women

IL-8 is protecting the urinary tract by recruitment of leukocytes involved neutrophil activation, and is released from several cell types in response to infection/inflammation, including monocytes, macrophages, neutrophils, and epithelial, fibroblast, endothelial (Qazi et al., 2011),(Tseng-Rogenski & Liebert et al, 2009),(Abbas et al., 2022).(D'Asheesh et al., 2020)

Conclusion

IL-8 was used as diagnostic tools to reveal the Urinary tract infection Elevated levels IL-8 act to protect the mucosal tissues from microbial invasion by preventing bacterial adherence to per urethral epithelia and uroepithelia linings of the genitourinary tracts and attracting and accumulating, activation, adhesion, and migration of immune cells to infection/inflammatory sites.

Ethical Approval

The study was carried out after obtaining the approvals of the patient and the Iraqi Ministry of Health.

Study Conflict: there are no studies conflicts.

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