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Evaluation urine IL-10 in pregnant women infected with UTI in different pregnancy trimesters at Samarra city

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ABSTRACT

Urinary tract infection is a common disease, affecting a large number of women especially pregnant women, the present study aimed to compare among levels of IL-10 in urine during different pregnancy periods. 70 samples of urine were collected from infected women and 20 samples of urine were used as a control. For culture of bacteria specific culture media are used. The result's show that gram-negative bacteria especially *Escherichia coli* were the highest incidence of UTI infection among the other different microorganisms species. Urine levels of IL-10 were estimated by ELISA and the result showed significant differences in IL-10 mean levels among trimester pregnancy groups and control group ($p < 0.01$). P-Value in the first trimester was 0.00002, in second trimester was 0.00003 and in the third trimester was 0.00001.

Introduction

The urinary tract infection (UTI) is one of the most common and frequent infections in pregnant women after respiratory tract infection and causes high mortality. The source of the infection of urinary tract infection and inflammation of the lower female genital tract is the normal flora present in the feces, as it colonize the vagina and urethra, begins with cystitis, then to the kidney and attributed the injury of these vital organs. While trying to avoid the host defenses the pathogen adheres to the special receptors present on the vaginal and urinary epithelial cells due to its ability to choose the appropriate place for its growth, reproduction and spread [1].

Cytokines are proteins that are excreted from immune cells and perform many functions of those cells, such as intercellular signals to regulate inflammatory responses, whether they are concurrent or systemic, therefore regulate the cellular or humoral immune response [2]. produced in response to microbes, other antigens and various cytokines stimulate an adverse response to cells that include immunity and inflammation [3].

IL-10 is an important pleiotropic immunoregulatory cytokine mainly secreted by macrophages, but also by T helper 1 (Th1) and Th2 lymphocytes, dendritic cells, cytotoxic T cells, B lymphocytes, monocytes and mast cells [4]. It is described as a product of Th2 lymphocyte which inhibits cytokines produced by

active phagocyte [5]. Plays an important role in the inflammation and immune response. Immune responses and its vital events include inhibition of the production of basic interleukins of inflammation such as interferon- γ of the macrophage, monocyte and Neutrophil [6].

Materials and methods

The urine's samples are divided into two parts, first for bacterial culture and the second centrifuged, the supernatant was frozen at -20°C until use to measure the level of IL-10 in urine, then the sediment applied on a clean slide, and a cover slide was applied over the urine sediment. Slide directly examined under the high power field (H.P.F) of light microscope to find out any pus cells, bacteria cells, casts, crystals erythrocytes and epithelial cells [7]. The isolates has been re-purified by sub-culturing on MacConky agar, Eosin methylene blue agar (EMB), *Pseudomonas* agar and nutrient agar by streaking method and incubated for 24 hours at a temperature 37°C. Depending on the morphological and cultural characteristics (such as color, size, shape and odor of the colony), as well as determine the bacterial ability to lactose fermenter [8]. Also Blood agar and nutrient agar are used to detect swarming phenomenon. Biochemical tests, including Indol test [9], Methyl red test [10], Voges-Proskauer test [10], citrate

utilization test [9], oxidase test [9], catalase production test [11], urase production test [9] and growth on Kligler Iron Agar (KIA) test [9].

Interleukine-10 Determination

IL-10 was quantitatively determined in urine of pregnant women with UTI, and UTI non-pregnant women as a control subjects. Pregnant women with UTI are grouped into three categories (first, second and third trimesters) according to the period of pregnancy. By mean of ELISA (Enzyme Linked Immunosorbent Assay) using ready kit for human IL-10 manufactured by Sunlog biotech company (china).

Results and Discussion

The current study classified the urinary tract infection in pregnant women according to bacterial *spp.* isolated in urine culture. Different bacteria *spp.* are reported in the study, among the reported species *E. coli* determined mostly in 38 (54.28%) patients, followed by *Klebsiella spp.* 16 (22.85%) patients, then *Pseudomonas spp.* 10 (14.28%) patients. The lowest reported species are *Proteus spp.* determined in 6 (8.57%) patients. The reported bacteria *spp.* illustrated in table (1).

Table 1: The reported bacteria *spp.* in urine samples of pregnant women

Reported bacteria	Number	Prevalence of infection %
<i>E. coli</i>	38	54.28
<i>Klebsiella spp.</i>	16	22.86
<i>Pseudomonas spp.</i>	10	14.28
<i>Proteus spp.</i>	6	8.58
Total	70	100

Previous studies, similar result reported by Al-Nuaimi (2002) study in Baghdad city; *E. coli* was the mostly reported bacterial *spp.* in urine samples of pregnant women. Other studies [12,13-15], also determined similar results (47%, 68% and 56.3%) respectively. Prais *et al.* [16] reported bacterial growth in 82% of their study cases and *Klebsiella spp.* isolated in 22.85% cases.

Hidron *et al.* [17] disagreed with our results isolated bacteria 6% cases 14.28% of which were *Pseudomonas spp.*, Leblebicioglu *et al.* [18] (2003) result was in agreement with our study results isolating *proteus spp.* in 8.57% cases. The differences in these ratios are due to the number of samples collected during the study period or the development of resistance of some bacterial species. Also, may be due to the difference in studied geographic area.

Determination Interleukine -10

Table 2: Levels of IL-10 in urine of pregnant women with UTI.

Period	N	Bacteria	IL-10 Mean± S.E. pg/ml Urine	P-Value
1	10	<i>E.coli</i>	29.47 ± 8.94 C	0.00002
	5	<i>Klebsilla spp.</i>	18.26± 3.76 d	
	6	<i>Pseudomonas spp.</i>	42.04 ± 8.77 b	
	2	<i>Proteus spp.</i>	18.75 ± 3.04 d	
2	8	<i>E.coli</i>	27.99 ± 1.45 c	0.00003
	7	<i>Klebsilla spp.</i>	16.77± 2.143 d	
	2	<i>Pseudomonas spp.</i>	45.70 ± 3.5 b	
	2	<i>Proteus spp.</i>	16.25± 4.31 d	
3	20	<i>E.coli</i>	31.40 ± 6.60 c	0.00001
	4	<i>Klebsilla spp.</i>	21.45± 10.18 d	
	2	<i>Pseudomonas spp.</i>	57.24 ± 9.8 a	
	2	<i>Proteus spp.</i>	20.95± 3.89 d	
Control	10		7.74± 0.542 e	

-Values represent the standard ±error rate

- Different letters mean there is a moral difference

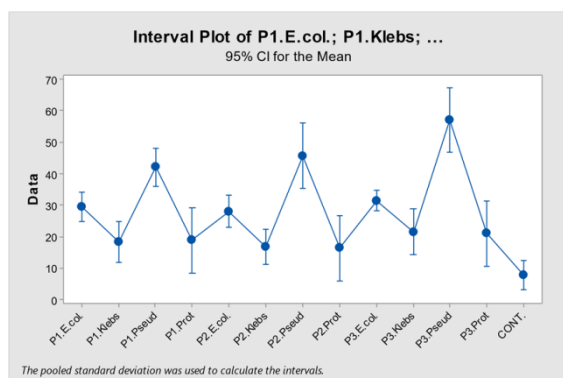


Fig. 1: Difference in IL-10 levels in urine during the three periods of pregnancy

The result in this table 2 show the high levels of IL-10 in urine, which compared with control this result is consistent with the study conducted by Duell *et al* [19] who found high levels of IL-10 explain the reason for this rise is due to a role for IL-10 in the innate response to human UTI. the increase in IL-10 concentration may be suggested to an inhibition mechanism - regulation of the release mechanism that inhibits the contacts [20]. This is consistent with Marchant and his group [21], who confirmed that the function of IL-10 is to inhibit the production of IL-6, IL-8, IL-1, cellular motor and the tumor necrosis factor of the type Alpha (TNF- α). Some infectious diseases such as urinary tract infections increase

during pregnancy due to physiological changes and a successful pregnancy in a woman must be a woman in a state of immunosuppressive inhibition, whether to accept the fetus, which is prepared by the immune system; foreign body or to protect it and protect the fetus from infections that Occur during pregnancy this is the action of cellular motors of TH2 (IL-4, IL-10) and that IL-10 is the first of the Th2 interludes and was thought to be produced from only immune cells, it is certain that it is produced from many cells including the connective cells as it is the IL-10 which is an anti-inflammatory rise, this is consistent with our study [22]. Therefore, studies conducted on pregnant mice to determine the extent of the effect of IL-10 on them have been shown to be produced in pregnant women from placental cells and uterus since the beginning of pregnancy to protect the mother and fetus from the risk of miscarriage due to the attack of the fetus's immune system as a foreign body [23]. The effect of IL-10 deficiency on pregnant mice was

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تقييم نسبة الانترليوكين 10 في بول النساء الحوامل المصابة بالتهاب المسالك البولية خلال فترة الحمل المختلفة في مدينة سامراء

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الملخص

عدوي المسالك البولية من الامراض الشائعة التي تؤثر على عدد كبير من النساء وخاصة النساء الحوامل، تهدف الدراسة إلى مقارنة بين مستويات IL-10 في البول خلال فترات الحمل المختلفة. تم جمع 70 عينة من البول من النساء المصابات و 20 عينة بول من النساء الحوامل غير المصابات كمجموعة سيطره . تم زرع البكتيريا الموجودة في البول وتشخيصها باستخدام اوساط زرعيه خاصه. وقد أظهرت البكتيريا السالبة للجرام وخاصة القولونية اعلي معدلات الاصابه بعدوى المسالك البولية بين أنواع الكائنات المجهرية المختلفة الأخرى. وقدرت مستويات IL-10 في البول بواسطة تقنية (ELISA) وأظهرت النتيجة اختلافات كبيره في المستويات المتوسطة من IL-10 بين مجموعات الحمل الثلاث ومجموعه السيطرة ($p < 0.01$) حيث كانت القيمه الاحتمالية لمستويات IL-10 في الثلث الاول من الحمل 0.00002 وفي الثلث الثاني كانت 0.00003 وفي الثلث الاخير كانت 0.00001.