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STUDY EFFECT OF URINARY TRACT INFECTION ON SOME BIOCHEMICAL PROFILE AMONG PATIENTS IN AL- NAJAF GOVERNORATE, IRAQ

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ABSTRACT

Urinary tract infection (UTI) is a worldwide health problem with an important health impacts on individual suffering from it in relation to effect on certain biochemical changes. **Aims of study:** The present study aims to find out the effect of UTI on some biochemical profile in patients and comparing that with normal individuals. **Methodology**: A cross-sectional study was conducted in Al- Najaf Province during the period between September 2014-March 2014, fulfilled by using different biochemical techniques for estimation of lipid and some other biochemical profile among randomly selected 120 patients with UTI and 150 healthy control individuals. **Results:** There were a significant decrease in the level of serum Cholesterol, Triglyceride (TG), Low-density lipoprotein (LDL), Very low-density lipoprotein (VLDL), with significant increase of High-density lipoprotein (HDL), also there were significant increase of blood urea with slight increase in serum creatinin, all above changes were among those with UTI when compared with normal control group. **Conclusion:** Urinary tract infection has a significant impact on lipid profile and some other biochemical changes when compared with healthy control group. **Recommendations:** Measuring of certain cytokine changes among patient with UTI to know whether a relationship with changes in lipid Profile.

KEYWORD: Urinary tract infection (UTI), lipid profile.

INTRODUCTION

Urinary tract infections are infection that affects part of the urinary tract if affects the lower urinary tract it is known as a simple cystitis and if affects the upper urinary tract it is known as pyelonephritis . The most frequent healthcare-associated infection in the United States.[1,2] and the second most frequent in Denmark.[3] Notably, urinary tract infections have been reported as a frequent focus of infection for enterococcal bacteremia.[2,4] As described earlier, human infections by enterococci have increased notably through the past two to three decades and this increase includes a rise in cases of urinary tract infections. It is reasonable to suspect the increase in enterococcal urinary tract infections to be partly responsible for the increase in enterococcal bacteremia due to the association of the two. A number of previous studies investigating enterococcal bacteremia, all found urinary tract infections as one of the dominant Sources of infection.[4,5]

The majority of urinary tract infections are related to indwelling urinary catheters.[6] Notably, patients with indwelling urinary catheters have been reported to have a high incidence of enterococcal urinary tract infections compared to patients receiving outpatient treatment.[7] It was described by the Egyptians as "sending forth heat from the bladder.[8] In young sexually active women, sexual activity is the cause of 75–90% of bladder infections, with the risk of infection related to the frequency of sex .[9]

U.T.I. are important because they may involve the urethra, the bladder, urethras and kidneys,[10] they are more common in females than males in ratio about 6:1 with exception of the neonatal period when the sexes are equally affected.[11] UTI cause considerable discomfort and inconvenience to the patient and are occasionally responsible for protracted symptoms or more serious manifestation, such as sepsis and death.[12]

MATERIALS AND METHODS

Study design and Patients: Samples were collected in the period from September 2014 until March 2015, 120 samples were randomly collected from patients with UTI and 150 healthy who attended the clinics AL-Sadder Teaching Hospital and AL-Zahra Hospital in AL-Najaf governorate.

Collection of Samples

Urine samples: Patients were supposed to have UTI after performing urinalysis and then confirmed with a urine culture, midstream urine collection is done to minimize sample

contamination. High colony count of one type of bacterium will be present if a person has a urinary tract infection, if there are three or more types of bacteria present, the sample is considered to be contaminated and discarded.

Blood samples: were also drawn from the patients by vein-puncture into specimen tubes and remains for 30 minutes at room temperature. After that the samples were centrifuged at 3000 rpm for 5 minutes (Backman /counter, Germany**)** to separate the serum and collected in other sterile tubes and kept in deep freeze at -20Cº till used for the determination of Lipid profile, urea, creatinine and uric acid.

SEROLOGICAL DIAGNOSIS

Estimation of Total Serum Cholesterol

Measurement of serum cholesterol by dependent on enzymatic method Where cholesterol esterat lysis to cholesterol and fatty acid by cholesterol esterase.[13]

Estimation of Total Serum glycerides (TG)

Measurement of TG in the serum by used enzymatic and colorimetric method, the Tri-glycerides in serum lysis enzymatically to Glycerol Phosphate and fatty acid by Lipase.[14]

Estimation of Total Serum High Density Lipoprotein (HDL)

Measurement of (HDL) in the serum by used sedimentation Lipoproteins are found with HDL, its include (LDL, VLDL) by used phosphotungistic acid solution with found Mg^{+}.[15]
The Very Low Density Lipoprotein concentration was calculated by using the following formula[16] VLDL.
Cholesterol (mg/100 ml) = Tri- glycerides/5.
The Low Density Lipoprotein Concentration was calculated by using the following formula Low density lipoprotein =Serum cholesterol - (VLDL+HDL).[17]

Statistical analysis

Data were analyzed using the software packages Graph pad prism for Windows (5.04, Graph pad software Inc. USA), Data are presented as the mean ± standard error (SE). The comparison between the patients and healthy groups were analyzed by one-way ANOVA. A p-value < 0.05 was considered significant.

RESULT

The present study recorded significant decrease in the level of cholesterol and Triglyceride, LDL and VLDL in patients (165.47± 0.601mg/dl; 123.2± 0.552; 101.83±0.328; 24.64±0.702) compared to healthy (186.3mg/dl; 134.9 mg/dl; 125.82; 26.98) respectively. While the HDL was significantly increase (39.0± 0.065mg/dl) compared to control group (33.5± 0,321 mg/dl). as showed in figuer (1); table(1), also this study recorded a non significant increase in level of serum uric acid but significant increase in level blood urea (28.6 ±0.032 mg/dl) compared with control group (25.1±0.811 mg/dl) as showed figuer (2); table(2).

Table 1: The level of lipid profile in patients with UTI and control group

Parameters	Paients with UTI	Control
Cholestrol (mg/dl)	165.47±0.60 *	186.3±1.24
Triglyceride (mg/dl)	123.2±0.552 *	134.9±1.65
LDL (mg/dl)	101.83±0.328*	125.82±0.62
VLDL (mg/dl)	24.64±0.702 *	26.98±0.54
HDL (mg/dl)	39.0±0.06 **	33.5±0.3

*Significantly lower than control at p<0.05.

**significantly higher than control at p<0.05.

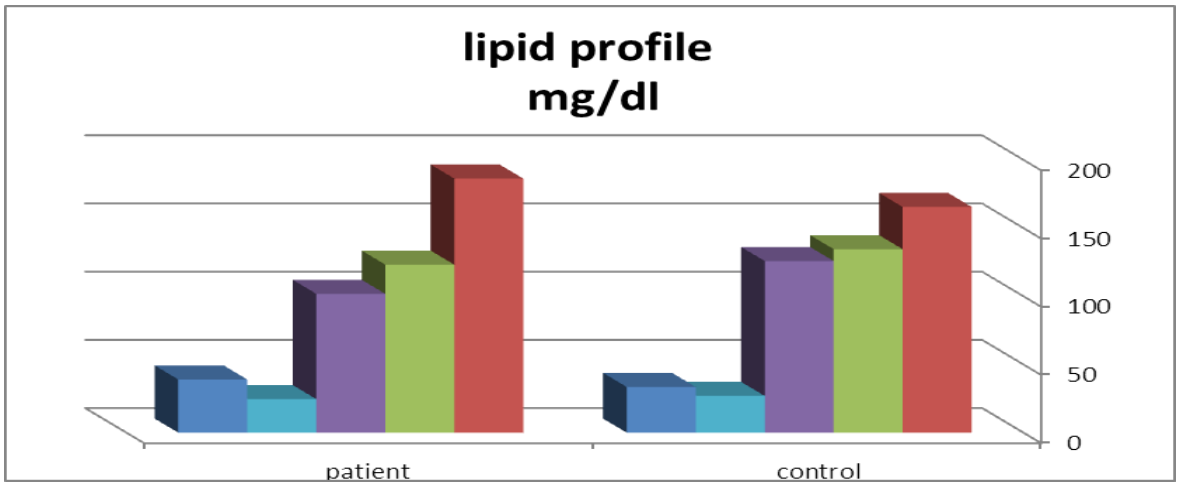

Figure 1: Lipid profile serum concentration (mg/dl) Comparison between Patients Suffering from urinary tract Infection and Control Group.

Table 2: The level of blood urea and in patients with UTI and control group

Parameters	Paients with UTI	Control
Blood urea (mg/dl)	28.6±0.032*	25.1±0.811

***significantly higher than control at p<0.05

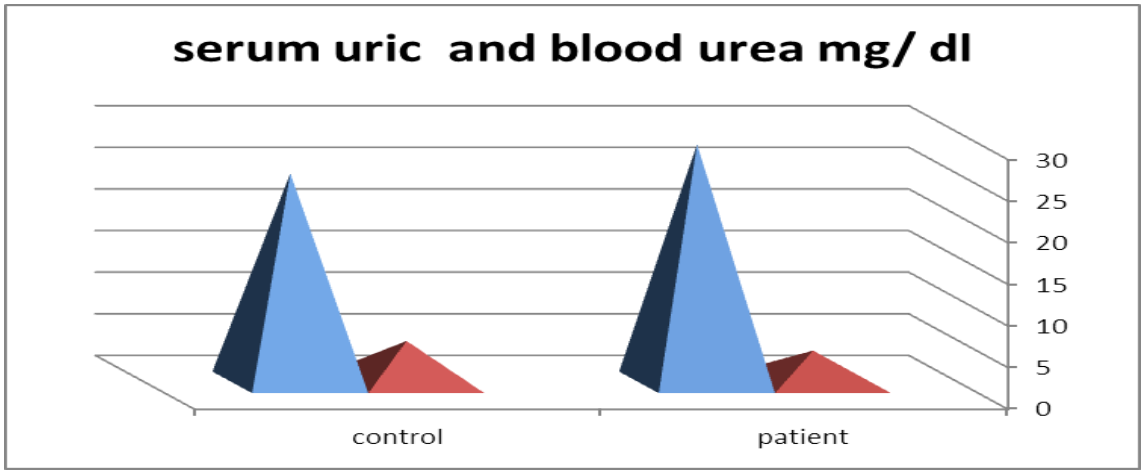

Figure 2: Serum uric acid and urea (mg/dl) Comparison between Patients Suffering from urinary tract Infection and Control Group.

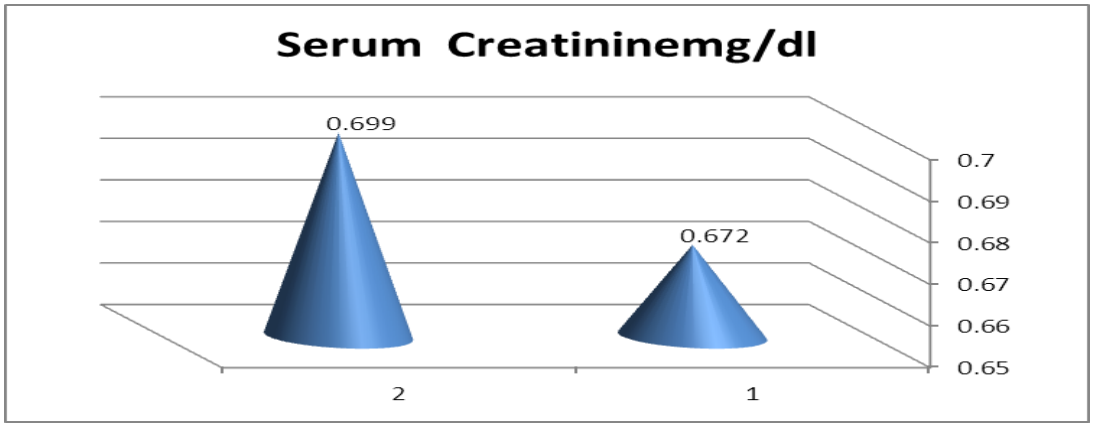

Figure 3: Creatinine serum concentration (mg/dl) Comparison between Patients Suffering from urinary tract Infection and Control Group.

DISCUSSION

In the present study the patients with urinary tract infection had significantly decreased level of total cholesterol when compared with the control, this go with finding of vanleuwen *et al*., 2003 (18) who stated that increased cytokines caused decreased level of cholesterol in acute illness. The interaction of increased level cytokines which are produced during urinary tract infection probably play a role to decrease the level of low density lipoprotein (LDL), or the level of (LDL) decreased due to the host immune response toward microorganism causing urinary tract infection which could induce (LDL) oxidation leading to reduced level of (LDL).[19]

It was stated that bacterial infection cause profound effect on different types of lipid concentration via formation of free radicals, these radicals will cause lipid peroxidation,[20]

consequently lipid peroxidation result in oxidative deterioration of polyunsaturated lipid,[19] moreover lipid are carried by lipoproteins, which is responsible for transportation of lipid to different tissue,[21,22] when an individual have UTI the function of these lipoprotein will be affected thereby the level lipid profile will be changed as a net result. The level of (HDL) will increase when compared with controlled healthy group this inconsistent with finding of Alvarez and Romas, 1986[23] who stated that (HDL) will decrease during sepsis.

Regarding triglyceride (TG) the current study revealed that TG was significantly decreased as compared with the healthy controlled group due to the alteration in the function and composition of the lipoprotein ,the present result was in agreement with gordon *et al*., 2001.[23]

CONCLUSIONS

In the present study patients with UTI have significant effect on the lipid profile in that there were significantly decreased in serum Cholesterol, TG, LDL, VLDL among patients with UTI when compared with health controlled group.

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