Effect of Serotonin Concentration and Some Variables in the Sera 6 hours before and after Dialysis on Chronic Kidney Patients with Different Ages in Iraqi Population

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Abstract

This study is concerned with chronic kidney disease and control group . The determine patients from (alseder hospital) in Najaf city during the period between January 2019 to July 2019. The CKD patient and control group consisted of sixty with age mean of (80 ±20) years. The blood samples were drawn from all patients 6 hours before and after dialysis to measurement serotonin , blood Urea, Creatinine , uric acid and hemoglobin and control group. Also the patients classified into two groups according to age . This variables measured by using assay (ELISA) technique and colorimetric methods. The higher mean value of serotonin was shown in CKD patients before dialysis (0.0257± 0.00224 ng /ml) compared with patients after dialysis (0.1894 ± 0.05189 ng/ml) compared with control group(0.0059 ± 0.00139 ng/ml). Also the higher value of blood Urea and Creatinine reversibly in CKD patients before dialysis was (126.25± 4.869 mg/dL**)**, (10.041± 0.3019 mg/dL**)** compared in blood Urea and Creatinine in CKD patients after dialysis was (48.183± 2.262 mg/dL**)**, (3.28± 0.201 mg/dL**)** and control group was (28.105 ± 1.896 mg/dL), (1. 095 ± 0.0961 mg/dL).

Also the higher value of uric acid and hemoglobin reversibly in CKD patients before dialysis was (8.0623± 0.1478 mg/dL**)**, (13.800 ± 0.16519 g/dL**)** compared in uric acid and hemoglobin in CKD patients after dialysis was (5.5361± 0.16055 mg/dL**)**, (12.383 ± 0.15872 g/dL**)** and control group was (2.6789 ± 0.2977 mg/dL), (13.742 ± 0.18954 g/dL) , all above results there was a significant difference and correlation ($p<0.05$).

Aim of study: Study the effect of serotonin, blood Urea, Creatinine , uric acid and hemoglobin 6 hours before and after dialysis on CKD patients and compared with control group .Study the effect of variables on CKD patients with different age and study the relation between CKD patients after and before dialysis.

Key words: *serotonin , Before and after dialysis, hemoglobin, uric acid, creatinine*

Introduction

The CKD in dialysis the has increased in the diabetes *mellitus*, chronic obstructive pulmonary disease[1] . Dialysis is considered a good treatment for patients[2] .Serotonin is main neurotransmitters acting on synapses of nerve cells and found in the gastrointestinal tract[3] . The changes serotonin are frequently observed in CKD patients[4] . Uric acid is the a final oxidation metabolite of the purine in the humans, the uric acid level is a risk factor for incident KD in the general human , that serum uric acid levels >7 mg/dl had an increased incidence of KD[5] . The kidney damage is marked by the rise in two chemical substances creatinine and urea is directly toxic and measure of the kidney function[6] . Creatinine is produced from muscles and excreted through the kidneys, creatinine concentration of the serum is maintained by the balance between its generation and excretion by the kidneys[7] .

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Materials and Methods

The subjects determine patients from (Al-Sadr hospital) in the city of Najaf during the period between January 2019 to July 2019. The CKD patient and control group consisted of sixty with age mean of (80 ±20) years. Also the patients classified into Patient's age less than 40 years (n=32) and patient age more than 40 years (n=28).

- Procedure of serotonin

In the Serum the concentrations of serotonin in the Serum were determined by using ELISA assays. The ELISA kits for testing serotonin were obtained from Elabscience Biotechnology co. Ltd. The serotonin of number is Product ID is (E-EL-H2187).

- Procedure of blood Urea

In the Serum the concentrations of Urea in the Serum were determined by using colorimetric methods were obtained from abcam Biotechnology co. The Urea of number is Product ID is (ab83362) (at absorbance = 570 nm) .

- Procedure of Creatinine

In the Serum the concentrations of Creatinine in the Serum were determined by using colorimetric methods were obtained from abcam Biotechnology co. The Creatinine of number is Product ID is (ab204537) (at absorbance = 490 nm) .

- Procedure of uric acid

In the Serum the concentrations of Uric Acid in the Serum were determined by using colorimetric methods were obtained from abcam Biotechnology co. The uric Acid of number is Product ID is (ab65344) (at absorbance = 570 nm) .

- Procedure of hemoglobin

In the Serum the concentrations of hemoglobin in the Serum were determined by using colorimetric methods were obtained from abcam Biovision co. The hemoglobin of number is Product ID is (K219-200) (at absorbance = 575 nm) .

Statistical Analysis

The statistical analysis was measuring by using SPSS version 17 in which mean, stander error, t-test and ANOVA test were used for data comparison. Correlation between of all variables were significant and a p value of <0.05.

Results

The purpose of this study was to evaluate the level of some variables (serotonin , blood Urea, Creatinine , uric acid and hemoglobin) associated with CKD patients 6 hours before and after dialysis and control group are shown in table (1). The higher mean value of serotonin was shown in CKD patients before dialysis (0.0257± 0.00224 ng /ml) compared with patients after dialysis (0.1894 ± 0.05189 ng/ml) compared with control group(0.0059 ± 0.00139 ng/ml). Also the higher value of blood Urea and Creatinine reversibly in CKD patients before dialysis was (126.25± 4.869 mg/dL**)**, (10.041± 0.3019 mg/dL**)** compared in blood Urea and Creatinine in CKD patients after dialysis was (48.183± 2.262 mg/dL**)**, (3.28± 0.201 mg/dL**)** and control group was (28.105 ± 1.896 mg/dL), (1. 095 ± 0.0961 mg/dL). Also the higher value of uric acid and hemoglobin reversibly in CKD patients before dialysis was (8.0623± 0.1478 mg/dL**)**, (13.800 ± 0.16519 g/dL**)** compared in uric acid and hemoglobin in CKD patients after dialysis was (5.5361± 0.16055 mg/dL**)** , (12.383 ± 0.15872 g/dL**)** and control group was (2.6789 ± 0.2977 mg/dL), (13.742 ± 0.18954 g/dL) , all above results there was a significant difference and correlation between the mean value in CKD patients before and after dialysis and control group ($p<0.05$). (Table1).

This result showed the correlation value between some variables (serotonin , blood Urea, Creatinine , uric acid and hemoglobin) in serum of 60 CKD patients before and after dialysis , the result revealed that correlation between serotonin before dialysis and serotonin after dialysis ($r = 0.058$ ($p<0.01$) . Also the high correlation between blood Urea before dialysis and blood Urea after dialysis ($r = 0.694$ ($p<0.05$) . The result showed correlation between Creatinine before dialysis and Creatinine after dialysis ($r = 0.050$ ($p<0.05$) . The result showed high correlation between uric acid before dialysis and uric acid after dialysis ($r = 0.241$ ($p<0.05$) . Also the high correlation between hemoglobin before dialysis and hemoglobin after dialysis ($r = 0.276$ ($p<0.05$) . (Table 2).

The concentrations of these variables were divided according to different age in CKD patients (Table 3). The patients were divided in to two groups according to the age intervals of patients : age less than 40y n=32 and age more than 40y n=28**.** The all levels of these variables showed a significant difference in each age group ($p < 0.001$)(Table 3). This result showed the correlation between serotonin less than 40 years and serotonin more than 40 years ($r = 0.268$ ($p<0.01$) . Also the high correlation between blood Urea less than 40 years and blood Urea more than 40 years ($r = 0.023$ ($p<0.05$) . The result showed correlation between Creatinine less than 40 years and Creatinine more than 40 years ($r = 0.488$ ($p<0.05$) . The result showed high correlation between uric acid less than 40 years and uric acid more than 40 years ($r = 0.135$ ($p<0.05$) . Also the high correlation between hemoglobin less than 40 years and hemoglobin more than 40 years ($r =$**-0.229** ($p<0.05$) . (Table 4).

Discussion

In this reports , we shown that the concentration of serotonin was higher in CKD patients before dialysis than CKD patients after dialysis and control groups . The concentration of serotonin in CKD was higher in less than 40 years than other deferent age . Until now, there are few studies about relation between serotonin and CKD . The increasing serotonin levels and serotonin receptors in patients of CKD [8]. Some factor effect on serotonin level such as depression and age is highly prevalent and is associated with poor quality of life and increased mortality among adults with CKD, Depression is well known to affect adults with end-stage KD [9]. Serotonin has been studied before and after dialysis because we believe there is a relationship between depression and kidney patients and serotonin is a trigger in depression and the risk of hospitalization due to psychiatric disturbances are higher in patients on dialysis in comparison with pre-dialysis and post-transplant patients, the neuropsychiatric manifestations in CKD patients [10].The Serotonin mechanisms that links with CKD, our resulting shown agree with reports [11]. The creatinine and serum urea was significantly high before dialysis and reduced significantly after dialysis, both serum creatinine and serum urea are widely accepted biomarkers to assess the renal functions [12]. Generally urea accumulation in blood serum of kidney failure patients arises from the degradation of food and tissues such as muscle[13].The high level of urea in blood leads the body very sick unless remove it from the blood streams by kidneys. mass differences [14]. Reduction in the level of creatinine during dialysis is also used as a surrogate marker of the inadequacy of dialysis [15]. During the study it was also observed that CKD is more 40 years are more affected with CKD our result agree with[16]. Uric acid level before and after dialysis is measurement and comber with control group our result agree with [17]. It is catabolism and production of uric acid is not limited to dialysis duration and uric acid metabolism measured immediately after dialysis is indicator of uric acid accumulation in the plasma[18].

Conclusions

In CKD patients there were increasing in serotonin, blood Urea, Creatinine, uric acid and hemoglobin in before dialyses compare in after dialyses and control group . Whereas, the serotonin and hemoglobin level were increased in these patients of less than 20 years. While blood Urea, Creatinine and uric acid level showed the highest value in the group of older than 40 years.

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