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The Relation between Hypothyroidism and Renal Functions in Patients of Renal Diseases

Wael A. Al Samnawy[1,a)] , Rehab J. Mohammed[2,a)] , Riyadh D. Al Zubaidi[3,c)]

[1,2)] *Department of Chemistry, College of Eduction for Pure Sciencs, University of Kerbala, Iraq*
[3)] *Professor of Internal Medicine, Department of Medicine, college of Medicine, University of Kerbala*

[a)] Corresponding author: wael.ali@ s.uokerbala.edu.iq
[b)] rehab.j@uokerbala.edu.iq
[c)] riyadh.dhayhood@uokerbala.edu.iq

Abstract . Thyroid hormones play important role in ″advance and developments″ of the kidney, and the conservation¸ of water and electrolytes hemostasis. Thyroid defunction explanation significant ˛changes in kidney function¸. ″Hypothyroidis*m* affects renal blood flow (RBF), and tubular function. The most accepted kidney derangement associated with˛ hypothyroidism are, altitude of serum *C*reatinine levels¸ reduction in GFR and (RBF). The aims of this study were to evaluate, the kidney functions in hypothyroidism. The materials and methods: This study included (70) patients with hypothyroidism,(43) of them with subclinical hypothyroidism and (27) of them with over hypothyroidism participated. The following biochemical parameters have been studied (Triiodothyronine, Thyroxine , Thyroid stimulating hormone, urea, and Creatinine). It was studied and done by mini VIDAS, spectrophotometry and chemistry auto analyzer. From August 2020 to January 2021, sera obtained from patients and control to the estimation of T3,T4,TSH, urea, and creatinine. The consequences of this study display that majority of cases were 30-65 years age of patients and control group. Thyroid dysfunction was found to have 80% more occurrence in CKD patients as compared to normal healthy controls. Most common thyroid dysfunction observed was subclinical hypothyroidism by low T_3 syndrome overt hypothyroidism. There was significant reduction of serum T_3 level (1.03 ± 0.67ng/ml) T_4 level (6.06 ± 2.13 ng/ml) and elevation of TSH level (1.63 ±2.2 µLu/ml) in cases compared with controls. The conclusion was thyroid dysfunction (subclinical hypothyroidism) showed a significant and appearance correlation in patients it's with CKD and thyroid disorder and patents of CKD various stage of CKD.

Keywords: renal function tests, thyroid stimulating hormone, thyroxine, triidothronine,.urea, creatinine.

INTRODUCTION

Hypothyroidism is a disorder that happen when the thyroid gland does not manufacture thyroid hormone to meet the body's needs. It recurs females about four times as males. Predefined an raised ˛serum thyrotropin¸ (of referred to as TSH) ˛level with regular¸ levels of free thyroxin redounds up to ten percent¸ of the adult inhabitants,. Hypothyroidism, is seldom related ˛with hypothyroid and ˛pothered¸ breadth or adjustment mood or cognition.[(1,2)] Thyroid hormone regulates metabolism and affects kinship each organ in the body. Crepuscular expose ˛cardiovascular abnormalities, left vorticular systolic and diastolic desiccation and damaged vascular relaxation, have been characterize in patients with grade 1 and 2 subclinical hypothyroidism.[(3)] Kidney activity thyroid hormone insufficiency be able to worsen hemodynamics by reduction cardiac output, leading to a progressive retreating in glomerular filtration GFR.[(4)] However, in patients accompanying renal failure requiring dialysis, hypothyroidism¸ was connected with ˛higher fatality the thyroids affirmcir¸.[(5)]

In elementary hypothyroidism; TSH levels are loud and ˛T_4 and T_3¸ levels are low. TSH most frequently intensify once T_4 and T_3 levels descend. TSH prompts the thyroid gland to fabricates firmest hormone.(6) ˛Subclinical hypothyroidism¸ is linked accompanying reduced exercise capacity but there is some dispute over whether to behave these patients- symptoms contingency meliorates on thyroxin therapy but concerns over risk of downplaying bone mineral bushier and atrial fibrillation. .

MATERIAL AND METEODS

This study included (70) patients of CKD with hypothyroidism,(43) of them with hypothyroidism and (27) of them with over hypothyroidism. (50) of patients were female and (20) were males, and 30

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healthy control (22) were female and (8) were males, with an age mean (44.96 y, 36.57 y) participated. The following biochemical parameters have been studied (Triiodothyronine, Thyroxine , Thyroid stimulating hormone, urea, and Creatinine. They were studied and done by mini VIDAS, spectrophotometry and chemistry auto analyzer . patients have gotten in Al kafeel specialist hospital in Karbalạ city. The patients with anemia were excluded from this study . The duration of the patients of chronic kidney disease CKD is at least 8 months. The patients were not smokers. The study From August 2020 to January 2021, sera obtained from patients and control to the estimation of T_3,T_4,TSH, urea, and creatinine. The consequences of this study. The results were expressed as Mean ± SD and analyzed statistically, The disagreement among the results of patients of and dominate were assessed by students t .test (p value 0.05), significant fluctuation was deemed when p value was less than point zero five. Urea and creatinine were determined by colorimetric method using kits. Pearson's relation analysis was done to study the relation among renal biochemistry with thyroid hormones. There was significant reduction of serum T3 level (1.03 ± 0.67ng/ml) T_4 level (6.06 ± 2.13 ng/ml) and elevation of TSH level (1.63 ±2.2 µLu/ml) in cases compared with controls. The conclusion was thyroid dysfunction (subclinical hypothyroidism) showed a significant and appearance correlation in patients it's with renal functions dysfunction and thyroid disorder and patients of various stage .

RESUITS AND DISCUSSION

TABLE.1. Comparison of biochemical parameters between patients of renal disease of hypothyroidism with control group.

parameter	subject	Mean± SD	range	P value
Age	Patients	44.96±26.79	(30-65)yr	NS
	control	36.57±24.56	(30-65)yr	
BMI(Kg/m^2)	Patients	39.66±21.69	(50-185)	0.050
	control	33.62±24.56	(50-185)	
T_4(ng/dL)	Patients	6.067±3.13	(4.87-11.73)	0.022
	control	6.302±1.79	(4.87-11.73)	
TSH(µlU/mL)	Patients	2.634±2.22	(0.35-4.97)	0.030
	control	2.201±1.43	(0.35-4.97)	
T_3(ng/dL)	Patients	1.030±0.67	(0.58-1.59)	0.042
	control	1.120±0.39	(0.58-1.59)	
Creatinine(mg/dL)	Patients	4.353±2.05	(0.7-1.3)	0.027
	control	1.053±0.28	(0.7-1.3)	
Urea(mg/dL)	Patients	121.16±49.69	(20-50)	0.035
	control	37.84±9.02	(20-50)	

No. of . patients of hypothyroidism=70 ,**No.** of . control of group = 30 ,P probability value , TSH thyroid stimulating hormones, T_3- triiodothyronine. T_4, thyroxine. linear relation between parameter in patients of (CKD) as shown in the following figure

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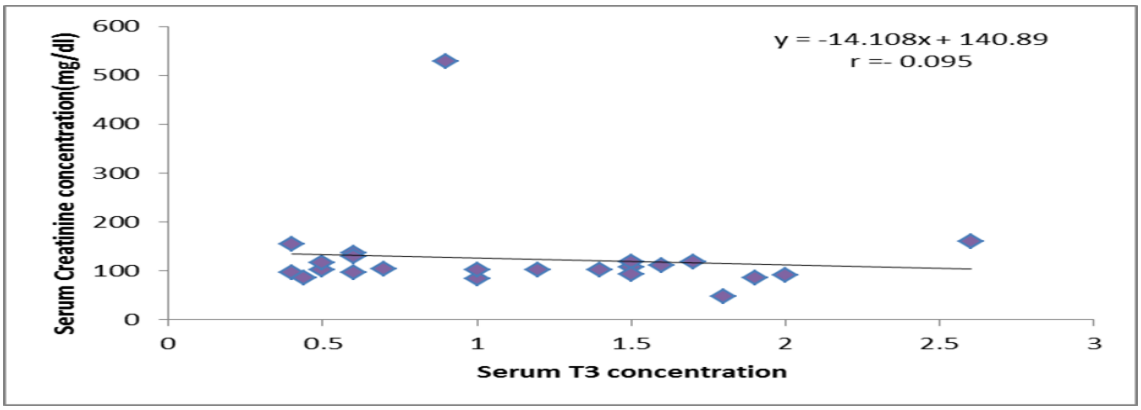

FIGURE .1. : Negative correlation between creatinine and T_3 concentrations in hypothyroidism

negative correlation between the serum creatinine values and serum T_3 (r = - 0.095, clearance values was observed a weak correlation.

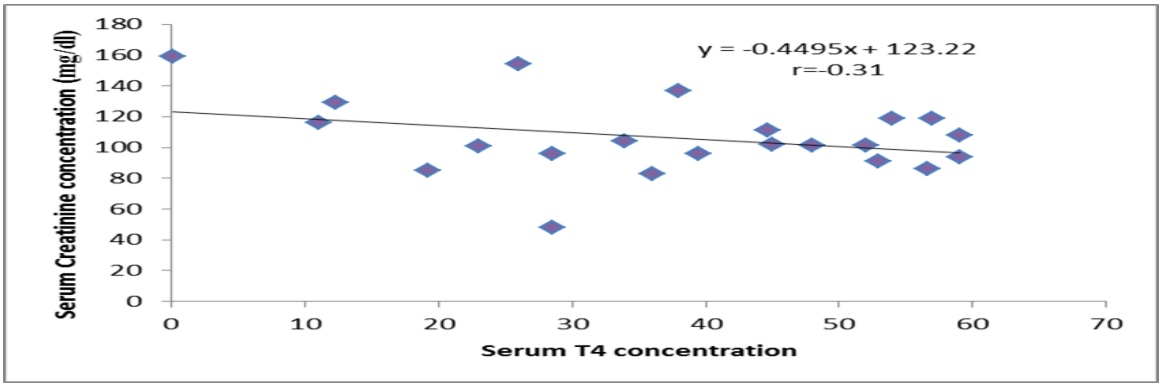

FIGURE 2.: Negative correlation between creatinine and T4 concentrations with overt hypothyroidism

Negative correlation between the creatinine values and serum TSH (r = -031,) using linear correlation coefficient in patients of hypothyroidism.

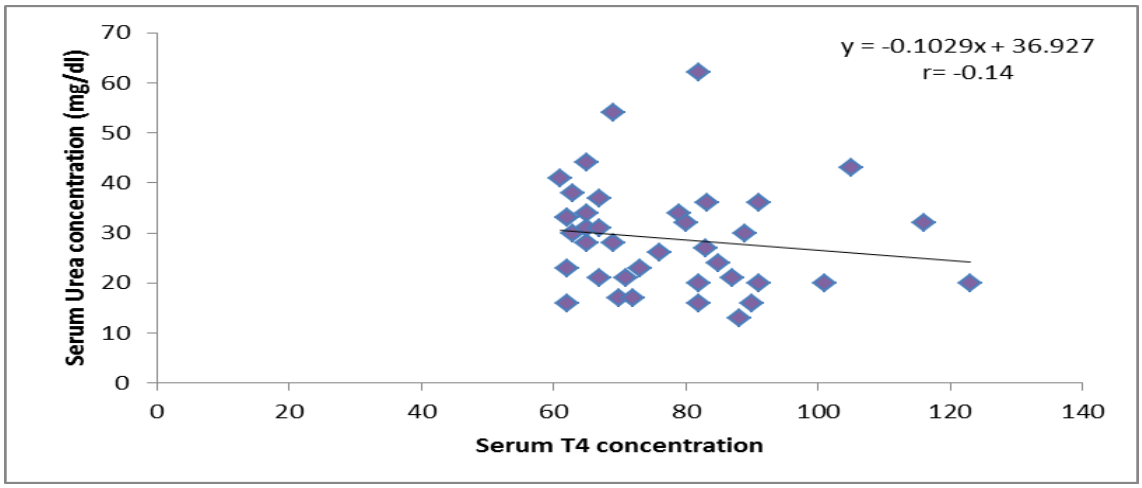

FIGURE 3 . Negative the Correlation between serum T_4 and urea concentrations in patients with Hypothyroidism.

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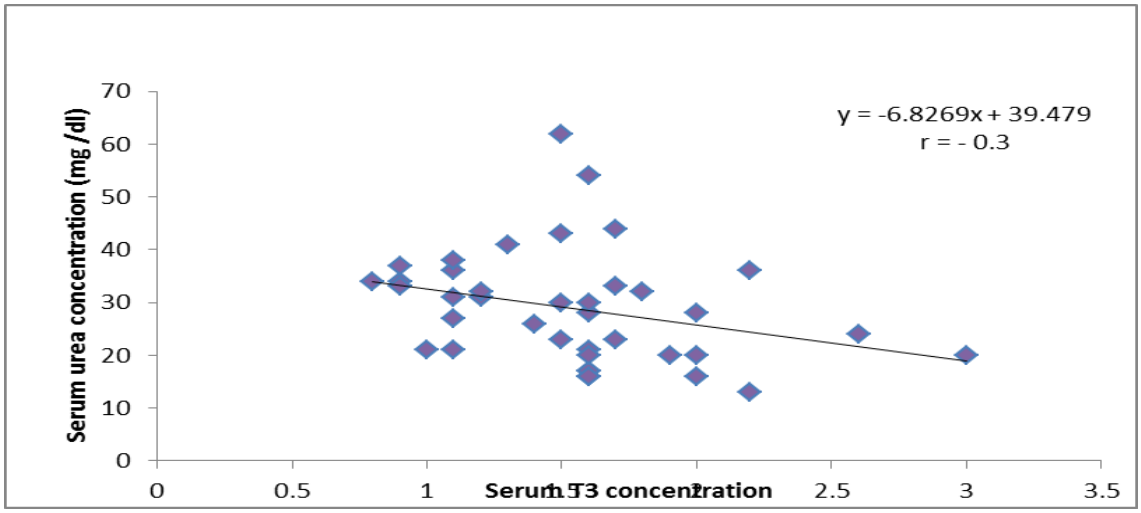

FIGURE 4 . Negative the Correlation between serum T_3 and urea Concentrations in patients with Hypothyroidism.

Moreover the level of serum urea was inversely correlated with serum T_4 and T_3 concentrations, but it does not reach the level of significance (r= -0.14 and r= - 0.3 respectively).

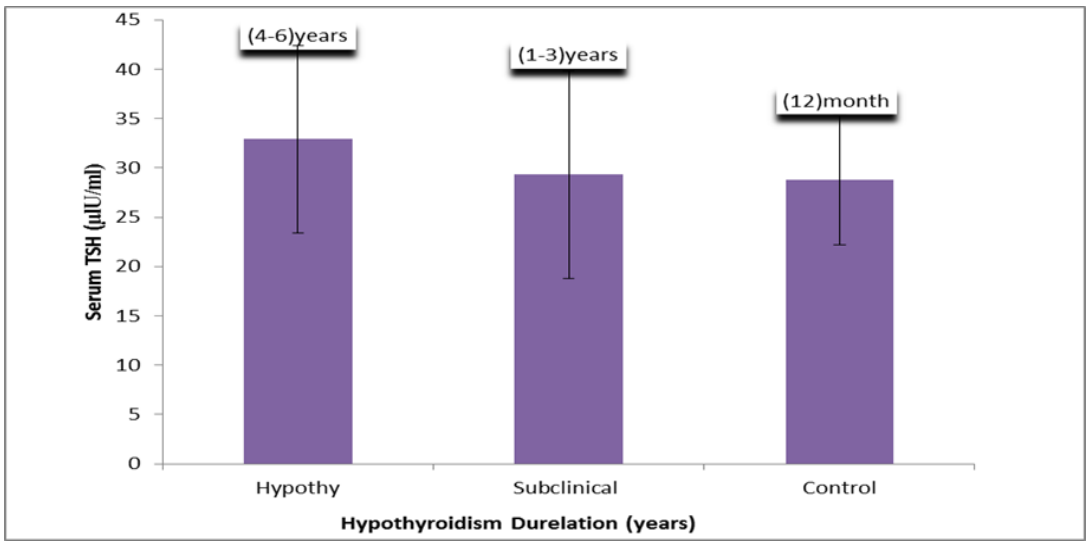

FIGURE 5 . Relation between duration of renal disease and thyroid stimulating hormones (TSH).

Follow-up was done from 8-11 months, 12-48 months(1-4yr), and 96 months, (6 years), and showed difference in some biochemical parameters, and there was variation in T_3, T_4 and TSH levels, with a significant increase of TSH levels in patients CKD of mean ± SD 26.183±18.976 after 12-96 months,(6yr). Compared with the control group 10.280±1.7266 as shown in figure 5.

Levels of biochemical parameters of the 70 patients of hypothyroidism and dominate group are summarized in table one the results are . Significant reduction (p=0.285),(0.184) levels of T_3,T_4 in patents when compared with group2, TSH levels significantly increased (p=0.353) in group1 when compared with health. Urea and creatinine levels were increase of patients when compared with control group (P = 0.244), and the levels of creatinine increase(p=0.221) of patients when compared to the control group. In this study as the patient were affected of thyroid disorder this because thyroid gland hormones influence protein authored and cell development. Thyroid hormone status effection the function renal calculated as decomposition and eventual renal function . [7] Thyroid functional

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disorders were commonly observed in patients with kidney disease and of thyroid function test abnormalities were frequently seen in those patients resulting from alterations in thyroid hormones synthesis, metabolism, and regulation. [8] Thyroid gland hormones play an consequential part in evolution with physiology of kidney, it is discerned that hypothyroidism reduces with hyperthyroidism augment the kidney to body mass Index aspect by a not full under stood procedures . It was probable that all cells in the body were targets from thyroid hormones. Whereas not strictly, necessary form life, thyroid hormone command profound influence on many "big time" physiological processes, such as advancement growth and metabolism , failure in thyroid hormones was not computers " with normal health. In addition many of the influence of thyro id hormone have been depict by study of dearth and excess emotions. Kidney was not just an member from metabolism , and destruction of thyroid hormone because a objectiv e of some of its job . Convinced influence of the hypothyroid on the kidney were well founded which contain alter in water . Hypothyroidism is befriend by a diminish in renal blood stream .[9] Both subclinical and overt hypothyroidism, is generally identify with weight gain. In the present study, the majority of patients were with in unacceptable, ranges of BMI in both overt (overweight 39%) which confirm the previous studies. Some investigators, regard the hormonal patients associated with mild disease connected state in which high serum TSH saves to continue, normal regulating thyroid hormone concentration. [10] But most representative raised TSH concentration, to be marker of true, albeit balmy thyroid hormone failure.

CONCLUSIONS

The aim of the study according of the results it finds of that apparent relation between thyroid gland and renal functions by the relation between the renal disease and disorder of thyroid hormones (hypothyroidism).

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