

Research Article

Frequency of thyroid dysfunction in cases of chronic kidney disease at Sahiwal Medical College Sahiwal

**¹Samee Ullah khan, ²Rizwan Rabbani
and ³Munaza Gohar**

¹Assistant Professor, Department of Nephrology,
DHQ Teaching Hospital Sahiwal

²Medical Officer, Surgimed Hospital,

Affiliated with Lahore medical and dental college, Lahore

³Ex-House Officer, Bahawal Victoria Hospital, Bahawalpur

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ABSTRACT

Objective: To determine the frequency of thyroid dysfunction in cases of chronic kidney disease at Sahiwal Medical College Sahiwal.

Material and methods: This cross sectional study was conducted at Department of Nephrology, Sahiwal Medical College Sahiwal from January 2018 to June 2018 over the period of six months. Total 130 patients of chronic kidney disease (as per operational definition) having age 20-60 years either male or female were included in the study. Thyroid dysfunction was assessed in selected patients.

Results: Total 130 patients of CKD were selected for this study. Mean age of the patients was 40.81 ± 12.51 years and mean duration of CKD was 5.5 ± 2.125 months. Out of 130 patients, thyroid dysfunction was noted in 45 (35%) patients. Thyroid dysfunction was observed in 26 (42.62%) patients of age group 20-40 years and in 19 (27.54%) patients of age group 41-60 years. Statistically insignificant ($P = 0.096$) association between age group and thyroid dysfunction was observed. Thyroid dysfunction was noted in 22 (29.73%) male patients and in 23 (41.07%) female patients. No association of thyroid dysfunction with gender was noted with p value 0.197.

Conclusion: Results of present showed higher rate of thyroid dysfunction in cases of chronic kidney disease. Most of the patients were belonged to age group 41-60 years and statistically insignificant association of thyroid dysfunction with age of the patients was observed. Most of the male patients were victim of CKD as compared to female patients but the difference of frequency of thyroid dysfunction between the male and female patients were not statistically significant.

Keywords: Chronic kidney disease, thyroid dysfunction, GFR, TSH

INTRODUCTION

Chronic kidney disease encompasses a spectrum of different pathophysiological processes associated with abnormal kidney function and a progressive decline in glomerular filtration rate (GFR).¹ Chronic Kidney Disease (CKD) is defined as per The kidney disease outcomes quality

initiative, 2003, [K/DOQI] of the National Kidney Foundation [NKF] as either kidney damage or a decreased kidney glomerular filtration rate of less than 60ml/min/1.73m^2 for 3 or more months (chronic renal failure corresponds to CKD stages 3-5).² Chronic kidney disease is a major public

health problem with increasing incidence and prevalence associated with poor outcome and high cost.³

The glomerular filtration rate (GFR) is considered to be a representative parameter for evaluating the functional state of the kidney.⁴ Inulin clearance is the gold standard for GFR estimation. However, this method is not performed in clinical practice, because of technical complexity and limited availability.⁵

Thyroid hormones play a very important role regulating metabolism, development, protein synthesis, and influencing other hormone functions. The two main hormones produced by the thyroid are triiodothyronine (T3) and thyroxine (T4).⁶ These hormones can also have significant impact on kidney disease so it is important to consider the physiological association of thyroid dysfunction in relation to chronic kidney disease (CKD).⁷ CKD has been known to affect the pituitary-thyroid axis and the peripheral metabolism of thyroid hormones.⁸ Low T3 levels are the most common laboratory finding followed by subclinical hypothyroidism in CKD patients. Hyperthyroidism is usually not associated with CKD but has been known to accelerate it.⁹ One of the most important links between thyroid disorders and CKD is uremia. Patients who are appropriately treated for thyroid disease have a less chance of developing renal dysfunction.¹⁰

Objective of present was to find out the frequency of thyroid dysfunction in cases of CKD. Results of this study may help us to manage the morbidity related to it.

OPERATIONAL DEFINITION

Chronic kidney disease (CKD):

CKD was defined as GFR below 90 ml/min/1.73 m² body surface areas for more than 3 months.

Thyroid dysfunction:

Subclinical hypothyroidism described as TSH more than 5 mIU/L and T4 level is in normal range.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Nephrology, Sahiwal Medical College Sahiwal from January 2018 to June 2018 over the period of six months. This study was approved by the ethical committee and written informed consent was taken from every patient.

Total 130 patients of chronic kidney disease (as per operational definition) having age 20-60 years either male or female were included in the this study. Patients with acute renal failure and patients on dialysis were excluded from the study. History was taken of all the patients and demographic profile was also noted on pre-designed proforma.

Blood samples of all the selected patients were taken and send to laboratory for analysis of serum TSH and T4 levels. Findings were noted on pre-designed proforma as thyroid dysfunction (Yes/No).

All the collected data was entered in SPSS version 18 and analyzed. Mean and SD was calculated for numerical data like age and duration of disease. Frequencies and percentages were calculated for categorical data like gender (Male/Female) thyroid dysfunction (Yes/No). Stratification was done for age gender and duration of disease. Post stratification chi-square test was applied to see the effect of these on outcome variable i.e. thyroid dysfunction. P value ≤ 0.05 was considered as statistically significant.

RESULTS

Total 130 patients of CKD were selected for this study. Mean age of the patients was 40.81 ± 12.51 years and mean duration of CKD was 5.5 ± 2.125 months. Out of 130 patients, thyroid dysfunction was noted in 45 (35%) patients. (Fig. 1) Selected patients were divided into two age groups i.e. age group 20-40 years and age group 41-60 years. Total 61 (46.92%) patients belonged to age group 20-40 years and 69 (53.08%) patients belonged to age group 41-60 years. Thyroid dysfunction was observed in 26 (42.62%) patients of age group 20-40 years and in 19 (27.54%)

patients of age group 41-60 years. Statistically insignificant ($P = 0.096$) association between age group and thyroid dysfunction was observed. (Table 1)

Male patients were 74 (56.92%) and female patients were 56 (43.08%). Thyroid dysfunction was noted in 22 (29.73%) male patients and in 23 (41.07%) female patients. No association of thyroid dysfunction with gender was noted with p value 0.197. (Table 2) Minimum duration of CKD was 3 months and maximum duration of CKD was

9 months. Patients were divided into two group according to duration of CKD i.e. 3-6 months duration and 7-9 months duration. Out of 69 (53.08%) patients of 3-6 months duration group, thyroid dysfunction was noted in 23 (33.33%) patients. Among the 61 (46.92%) patients of 7-9 months group, thyroid dysfunction was noted in 22 (36.07%) patients. Statistically insignificant association thyroid dysfunction with duration of CKD was noted with p value 0.854. (Table 3)

Fig. 1: Frequency of thyroid dysfunction

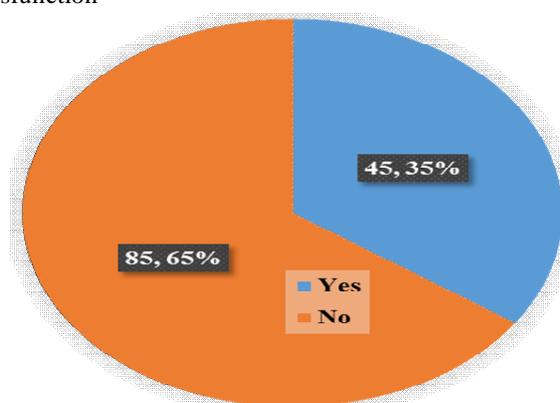


Table 1: Association of thyroid dysfunction with age

Age Group	Thyroid Dysfunction		Total	P value
	Yes	No		
20-40	26 (42.62)	35 (57.38)	61 (46.92)	0.096
41-60	19 (27.54)	50 (72.46)	69 (53.08)	
Total	45 (35)	85 (65)	130	

Table 2: Association of thyroid dysfunction with gender

Gender	Thyroid Dysfunction		Total	P value
	Yes	No		
Male	22 (29.73)	52 (70.27)	74 (56.92)	0.197
Female	23 (41.07)	33 (58.93)	56 (43.08)	
Total	45 (35)	85 (65)	130	

Table 3: Association of thyroid dysfunction with duration of CKD

Duration (Months)	Thyroid Dysfunction		Total	P value
	Yes	No		
3-6	23 (33.33)	46	69 (53.08)	0.854
7-9	22 (36.07)	39	61 (46.92)	
Total	45 (35)	85 (65)	130	

DISCUSSION

Objective of present study was to evaluate the frequency of thyroid dysfunction in patients of CKD. Mean age of the patients was 40.81 ± 12.51 years and mean duration of CKD was 5.5 ± 2.125

months. Out of 130 patients, thyroid dysfunction was noted in 45 (35%) patients.

In one study by Gupta et al,¹¹ out of 100 CKD patients, 25 were found to have subclinical hypothyroidism and 75 were euthyroid. The mean

age in patients was 47.72 ± 10.09 years. total 12 males (48%) and 13 females (52%) patients were found to have subclinical hypothyroidism. In this study prevalence of SCH was highest in age group of 40-50 years. In our study male patients were 74 (56.92%) and female patients were 56 (43.08%). Thyroid dysfunction was noted in 22 (29.73%) male patients and in 23 (41.07%) female patients. No association of thyroid dysfunction with gender was noted with p value 0.197.

In another study by Shantha et al,¹² prevalence of thyroid dysfunction was 24.8%. Similarly Khatiwada S et al,¹³ reported prevalence of subclinical hypothyroidism as 27.2%.

Shantha et al¹⁴ reported frequency of thyroid dysfunction as 24.8% in cases of CKD.

In another study by Chandra et al¹⁵ among 1,863 CKD patients, 358 patients underwent biochemical analysis for hypothyroidism. Among these, 143 had biochemical subclinical hypothyroidism and 59 had overt hypothyroidism. Patients in the overt hypothyroid group had significantly higher TSH levels and a lower free T4 level than those in the nonhypothyroid group. Thyroid autoimmunity and subclinical primary hypothyroidism are highly prevalent in CKD patients not requiring long-term dialysis treatment.¹⁶ Lo et al¹⁷ reported a prevalence of hypothyroidism of 23.1% in CKD patients with an eGFR < 30 mL/min/1.73 m². In another study, subclinical hypothyroidism and clinically apparent hypothyroidism have been reported to occur in 18-20% of patients with CKD.¹⁸

CONCLUSION

Results of present showed higher rate of thyroid dysfunction in cases of chronic kidney disease. Most of the patients were belonged to age group 41-60 years and statistically insignificant association of thyroid dysfunction with age of the patients was observed. Most of the male patients were victim of CKD as compared to female patients but the difference of frequency of thyroid dysfunction between the male and female patients were not statistically significant.

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