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Original Research Article

ASSESSMENT OF THYROID DYSFUNCTION AMONG PATIENTS OF CHRONIC KIDNEY DISEASE AT TERTIARY CARE CENTRE

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ABSTRACT

Background: Chronic kidney disease is differentiated from acute kidney disease or acute kidney injury by its longterm form of kidney disease in which symptoms are presents for over 3 months. Several studies from all over the world reported prevalence of chronic kidney disease varies from 5-10% and recognized as public health problem globally. **Material & Methods:** The present prospective study was conducted among the patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination based upon National Kidney Foundation (NKF) criteria were enrolled into the study. Written informed consent was taken from each study participant. **Results:** In present study, out of total study participants, based on the Serum creatinine (mg%) status, among the study participants who had serum creatinine levels less than 5 mg%, 18% had TSH less than 5, 6% had TSH between 5-10 and none of them had TSH more than10. Among the study participants who had serum creatinine levels more than 5 mg%, 52% had TSH less than 5, 20% had TSH between 5-10 and 4% had TSH more than10. among the study participants who had 24 hour urine protein levels less than 1 gm%, 20% had TSH less than 5, 4% had TSH between 5-10 and none of them had TSH more than 10. Among the study participants who had 24-hour urine protein levels more than 1 gm%, 50% had TSH less than 5, 22% had TSH between 5-10 and 4% had TSH more than 10. **Conclusion:** We concluded from the present study that sub-clinical hypothyroidism is significantly associated as an additional risk factor in patients of Chronic Kidney Disease. We found significant association of serum creatinine, serum albumin levels and 24-hour urine protein with sub-clinical hypothyroidism.

Keywords: Chronic kidney disease, Subclinical hypothyroidism, Thyroid dysfunction.

INTRODUCTION

According to the previous studies, chronic kidney disease was among the common causes of mortality worldwide and its incidence is increasing decade by decade **(1)**. A study reported that more than 2 million people from all around the world were on treatment with dialysis or opts for kidney transplant **(2)**. Chronic kidney disease is differentiated from acute kidney disease or acute kidney injury by its long-term form of kidney disease in which symptoms are presents for over 3 months. Several studies from all over the world reported prevalence of chronic kidney disease varies from 5-10% and recognized as public health problem globally **(3)**.

It is well established various researches that thyroid hormones functions very important role in development, regulating metabolism, protein synthesis, and functioning of other hormones. The thyroid gland produces two main hormones namely triiodothyronine (T3) and thyroxine (T4) and they play significant role in functioning of renal system **(4)**. Hence, it is important to evaluate the association of thyroid disorders in relation to etiopathogenesis of chronic kidney disease. Peripheral metabolism of thyroid hormones and pituitary-thyroid axis reported to be affected in chronic kidney disease and characterized by the Low T3 level which is followed by subclinical hypothyroidism findings **(5)**.

However, some studies reported that hyperthyroidism is not usually associated with chronic kidney disease but sometimes has been shown to accelerate it. Uremia ia among the most important associated factor between thyroid disorders and chronic kidney disease. Some studies reported that patients who were treated or operated for thyroid disorders had a less incidence of developing chronic kidney disease **(6)**. We conduct the present study to assess the thyroid dysfunction among patients of chronic kidney disease at tertiary care centre.

MATERIALS & METHODS

The present prospective study was conducted at department of general medicine of our tertiary care hospital. The study was an observational study conducted during a period of one year. The study was done at 95% confidence interval at 10% of maximum allowable error. The sample size of 50 patients was calculated by epi info software. All the patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination based upon National Kidney Foundation (NKF) criteria were enrolled into the study. Clearance from hospital ethics committee was taken before start of study. Written informed consent was taken from each study participant.

All the study participants were subjected to general physical and clinical examination and detailed history was recorded from all of them. We exclude the patients from the present study who had family history of thyroid disorder, patients had past history of any treatment for thyroid disease, had history of any operative procedure or any radiological intervention for thyroid gland disorders. All the study participants were subjected to routine blood investigation for complete blood count, urine routine and microscopic examination, kidney function test, serum electrolytes, thyroid profile, lipid profile, liver function test, USG abdomen and 24 Hour urine protein. All the recorded data was entered in an Excel spread sheet on Microsoft Excel 2016. The statistical analysis was done using the Statistical software package SPSS v22 and Epi Info v7.2. A p-value <0.05 with 95% confidence intervals were considered statistically significant.

RESULTS

In present study we enrolled a total of 50 patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination based upon National Kidney Foundation (NKF) criteria and their presenting signs, symptoms and laboratory findings were recorded. All the study participants were above the age of 18 years of age and age of study participants was ranged from20 to 66 years with the mean age of 46.45 years. Out of the total majority of study participants were in the age group of 40 - 50 years 31% which was followed by 22% in the 30-40 years of age group and 21% in the age group of 50 to 60 years. 14% study participants were in the age group of more than 60 years and 12% study participants were in the age group of less than 30 years. In the present study males 56% were more common than females 44%. (Table 1)

Table 1: Distribution of study subjects according to the age and gender.

Parameters		No. of patients
Age (years)	<30	21%
	30-40	35%
	40-50	31%
	50-60	14%
	>60	8%
Gender	Male	56%
	Female	44%

In present study, out of total study participants, based on the Serum creatinine (mg%) status, among the study participants who had serum creatinine levels less than 5 mg%, 18% had TSH less than 5, 6% had TSH between 5-10 and none of them had TSH more than10. Among the study participants who had serum creatinine levels more than 5 mg%, 52% had TSH less than 5, 20% had TSH between 5-10 and 4% had TSH more than10. (Table 2)

In present study, out of total study participants, based on the Serum albumin (gm%) status, among the study participants who had serum albumin levels up to 1 gm%, 6% had TSH less than 5, 10% had TSH between 5-10 and 2% had TSH more than 10. Among the study participants who had serum albumin levels up to 2 gm%, 44% had TSH less than 5, 12% had TSH between 5-10 and 2% had TSH more than10. Among the study participants who had serum albumin levels up to 3 gm%, 20% had TSH less than 5, 4% had TSH between 5-10 and none of them had TSH more than10. (Table 2)

Table 2: symptoms wise distribution of study subjects

Study parameters		TSH (<5)	TSH (5-10)	TSH (>10)
Serum Creatinine (mg%)	<5	9 (18%)	3 (6%)	0
	>5	26 (52%)	10 (20%)	2 (4%)
Serum albumin (gm%)	1	3 (6%)	5 (10%)	1 (2%)
	2	22 (44%)	6 (12%)	1 (2%)
	3	10 (20%)	2 (4%)	0
24 HR URINE PROTEIN (gm%)	Less than 1	10 (20%)	2 (4%)	0
	More than 1	25 (50%)	11 (22%)	2 (4%)

In present study, out of total study participants, based on the 24-hour urine protein (gm%) status, among the study participants who had 24 hour urine protein levels less than 1 gm%, 20% had TSH less than 5, 4% had TSH between 5-10 and none of them had TSH more than 10. Among the study participants who had 24-hour urine protein levels more than 1 gm%, 50% had TSH less than 5, 22% had TSH between 5-10 and 4% had TSH more than 10. (Table 2)

DISCUSSION

In present study we enrolled a total of 50 patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination based upon National Kidney Foundation (NKF) criteria and their presenting signs, symptoms and laboratory findings were recorded. All the study participants were above the age of 18 years of age and age of study participants was ranged from20 to 66 years with the mean age of 46.45 years. Out of the total majority of study participants were in the age group of 40 - 50 years 31% which was followed by 22% in the 30-40 years of age group and 21% in the age group of 50 to 60 years. 14% study participants were in the age group of more than 60 years and 12% study participants were in the age group of less than 30 years. In the present study males 56% were more common than females 44%. Similar results were obtained in a study conducted by Ghanshyam P et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported high prevalence of sub-clinical hypothyroidism in their end stage renal disease patients. They also reported that serum albumin levels was significantly associated with sub-clinical hypothyroidism **(7)**. Similar results were obtained in a study conducted by Ea Wha Kang et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported high prevalence of sub-clinical hypothyroidism in chronic renal disease patients **(8)**.

In present study, out of total study participants, based on the Serum creatinine (mg%) status, among the study participants who had serum creatinine levels less than 5 mg%, 18% had TSH less than 5, 6% had TSH between 5-10 and none of them had TSH more than10. Among the study participants who had serum creatinine levels more than 5 mg%, 52% had TSH less than 5, 20% had TSH between 5-10 and 4% had TSH more than 10. Similar results were obtained in a study conducted by Zulfikar J et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported nearly similar results to present study **(9)**. Similar results were obtained in a study conducted by Gilles R et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported high prevalence of sub-clinical hypothyroidism in chronic renal disease patients. They also reported that proteinuria was significantly associated with sub-clinical hypothyroidism **(10)**

In present study, out of total study participants, based on the Serum albumin (gm%) status, among the study participants who had serum albumin levels up to 1 gm%, 6% had TSH less than 5, 10% had TSH between 5-10 and 2% had TSH more than 10. Among the study participants who had serum albumin levels up to 2 gm%, 44% had TSH less than 5, 12% had TSH between 5-10 and 2% had TSH more than 10. Among the study participants who had serum albumin levels up to 3 gm%, 20% had TSH less than 5, 4% had TSH between 5-10 and none of them had TSH more than10. Similar results were obtained in a study conducted by Nehal R et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported nearly similar results to present study **(11)**.

In present study, out of total study participants, based on the 24-hour urine protein (gm%) status, among the study participants who had 24-hour urine protein levels less than 1 gm%, 20% had TSH less than 5, 4% had TSH between 5-10 and none of them had TSH more than 10. Among the study participants who had 24-hour urine protein levels more than 1 gm%, 50% had TSH less than 5, 22% had TSH between 5-10 and 4% had TSH more than 10. Similar results were obtained in a study conducted by Michel C et al among patients of Chronic Kidney Disease above 18 years of age and diagnosed on the basis of history, detailed clinical examination and laboratory investigation. They reported high prevalence of sub-clinical hypothyroidism in chronic renal disease patients. They also reported that proteinuria was significantly associated with sub-clinical hypothyroidism **(12)**.

CONCLUSION

We concluded from the present study that sub-clinical hypothyroidism is significantly associated as an additional risk factor in patients of Chronic Kidney Disease. We found significant association of serum creatinine, serum albumin levels and 24-hour urine protein with sub-clinical hypothyroidism. However, further studies are needed with more patients to generalization of study results.

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