



A STUDY ON THYROID DYSFUNCTION IN CHRONIC KIDNEY DISEASE

Dr. B. Rajendra Naik

MD., Designated Assistant Professor, Dept. of General Medicine, Sri Venkateswara Medical College, Govt. General Hospital, Tirupati.

Dr. K. Manoraju*

MD., Designated Associate Professor, Dept. of General Medicine, Kurnool Medical College/ Govt. General Hospital, Kurnool. *Corresponding Author

ABSTRACT The world is facing a global pandemic of chronic kidney disease. As the morbidity and mortality from infectious diseases decline, life expectancy increases and chronic degenerative diseases have become more prevalent. CKD is unique amongst the chronic non-infectious illnesses". CKD is a widely recognized cause of nonthyroidal illness-causing thyroid dysfunction, i.e., alteration in thyroid hormones in the absence of underlying intrinsic thyroid disorder. Chronic Kidney Disease affects thyroid function in multiple ways, including low circulating thyroid hormone concentration, altered peripheral hormone metabolism, disturbed binding to carrier proteins, possible reduction in tissue thyroid content and increased iodine stores in thyroid glands. When hypothyroidism becomes more severe, it can cause reduced cardiac function and lead to progressively worsening kidney function. When hypothyroidism becomes more severe, it can cause reduced cardiac function and lead to progressively worsening kidney function. Thus the prevalence of subclinical hypothyroidism in patients with CKD might be a risk factor for both cardiovascular disease and progressive kidney disease. So the early detection of thyroid abnormalities reduces cardiovascular and progressive kidney disease. The analysis was done by a biochemical study on thyroid function.

KEYWORDS : CKD- chronic kidney disease

INTRODUCTION:

This study is designed to determine the prevalence of thyroid dysfunction in CKD patients to intervene early in the thyroid hormone abnormalities and reduce the cardiovascular risk and progressive worsening of kidney function.

MATERIALS AND METHODS:

This was a prospective cross-sectional study where newly detected CKD patients attending the o/p department of general medicine GGH Kurnool were selected randomly for enrollment into the study. A total of 80 patients diagnosed to have CKD with stages 3 to 5 with creatinine clearance < 60ml per minute were studied from 2017 to 2019. 80 age and sex-matched healthy controls were enrolled in the study. A total of 80 CKD patients were included in the study. The patient's age range from 23 to 75 years. The number of males were 60 (75%) and females were 20 (25%).

RESULT:

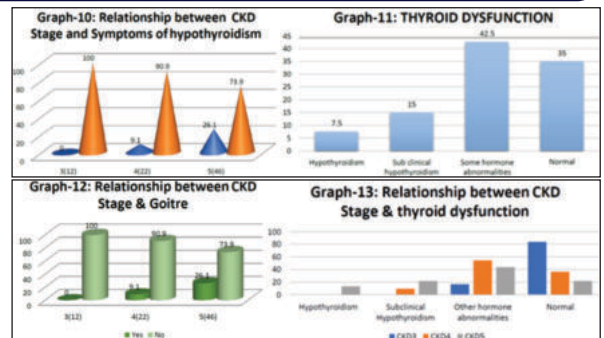
Most cases (75%) were between 31 to 60 years. Males constitute 75% and females constitute 25% of the study group. In our study of the 80 patients of the sample blood urea levels of 40-80 mg/dl -12 patients, blood urea levels of 81- 120 mg/dl-42 patients, blood urea levels of 121- 160 mg/dl- 14 patients, blood urea levels of 161- 200 mg/dl-10 patients of the sample serum creatinine levels 0-4 mg/dl-33 patients, serum creatinine levels 4-8 mg/dl-27 patients, serum the creatinine levels 8-12 mg/dl-16 patients, serum creatinine levels 12-16 mg/dl-4 patients.

In this sample, 12 patients belonged to stage 3, 22 patients to stage 4 and 46 patients to stage 5. Of the 80 patients in this sample, 6 patients (7.5%) had hypothyroidism 12 patients (15%) had subclinical hypothyroidism 34 patients (42.5) had some thyroid hormone abnormalities.

Totally 28 patients (65%) had some thyroid dysfunction. Of the 80 patients in this study group, 46 patients had stage 5 CKD. The prevalence of goitre in stage 3 CKD was 0 %, in stage 4 CKD 9.1% and in stage 5 CKD 26.1%.

The more the stage of CKD, the higher was the prevalence of goitre. In the study group, 46 patients had stage 5 CKD. 13% of stage 5 CKD pts had hypothyroidism when compared to stage 3 (0%) and stage 4(0%). 21.7% of stage 5 CKD patients had subclinical hypothyroidism.

The mean hormone abnormalities to stage 3(0%) and stage 4 (9.1%). Some hormone abnormalities in stages 3, 4 & 5 CKD were 16.7%, 54.5% and 43.5% respectively. So higher the stage of CKD higher was the prevalence of thyroid dysfunction. This correlation was found to be statistically significant.



DISCUSSION:

Many patients with chronic kidney disease have a mild reduction in thyroid function or subclinical hypothyroidism – a condition that becomes more common as kidney function declines. In our study, 53.3% of the patients have thyroid profile abnormalities. The remaining 46.7% of patients had normal thyroid profiles. Among the patients with thyroid dysfunction hypothyroidism is present in 10.7% of patients. Excluding the primary hypothyroidism patients, 42.7% of patients have decreased serum T3 values (low T3 syndrome). Among these low T3 syndrome patients 21.3% of patients also have decreased serum T4 value (low T4 syndrome). The percentage of patients who have low T3 syndrome increases with the decrease in creatinine clearance, which is statistically significant. The increase of low T4 percentage does not show this linear relationship with creatinine clearance. The mean T3 value is below a normal limit after excluding hypothyroidism patients the mean T3 value is within low normal limits. The mean T3 value progressively decreases with a decline in creatinine clearance. This means the T3 value has a linear correlation with the severity of renal disease which is statistically significant. In our study excluding those with hypothyroidism, 14 patients have slightly elevated TSH.

Eight patients had TSH in the range of 10 to 20 μ U/ml. In these eight patients, only five have low T4 levels, among them, only one patient had few clinical features of hypothyroidism. An investigation like free T4, Free T3, TRM response and antithyroid antibodies can be done to diagnose hypothyroidism in these patients. Of the 80 patients studied, 6 pts (7.5%) had hypothyroidism, 12 patients (15%) had subclinical hypothyroidism, and 34 patients (42.5%) had some thyroid hormone abnormalities in the form of a reduction in TT3, TT4 and FT3 levels. So totally of 65% of patients with CKD had thyroid hormone abnormalities. Of the 80 patients studied, 14 patients (17.5%) had a goitre. The prevalence of hypothyroidism does not correlate with the severity of the renal failure. The symptoms of hypothyroidism are

present both in CKD with hypothyroidism patients and in CKD patients without hypothyroidism. So, the diagnosis of hypothyroidism in CKD mainly relies on TSH level which should be more than 20 μ U/ml with low serum T4. It also showed that Total T3 and Total T4 levels were lower than normal, especially among patients with stage 4 & 5 CKD. A progressive reduction in values of Total T3 and Total T4 were observed as the severity of renal failure increased. Overall the prevalence of thyroid hormone abnormalities in stages 3,4 and 5 CKD pts were 16.7%, 63.6% and 78.2% respectively in our study." Thyroid hormone abnormalities could represent a risk factor for cardiovascular disease and might also be implicated in kidney disease progression".

CONCLUSION:

The prevalence of thyroid abnormalities increases with an increase in the stage of CKD. Thyroid hormone abnormalities could represent a risk factor for cardiovascular diseases and might also be implicated in kidney disease progression.

- ❖ In our study, the prevalence of thyroid dysfunction is 65% in patients with chronic kidney disease.
- ❖ 7.5% of Chronic Kidney Disease patients had hypothyroidism.
- ❖ 15% had subclinical hypothyroidism.
- ❖ 42.5% had abnormalities of thyroid hormone.
- ❖ 17.5% of Chronic Kidney Disease patients had a goitre.
- ❖ There was a significant correlation between the prevalence of thyroid dysfunction and the stage of chronic kidney disease.
- ❖ Increase the severity of renal insufficiency; increase the prevalence of thyroid hormones.

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