

Original Article

The Study of Thyroid Profile in Patients with Chronic Kidney Disease — A Hospital Based Observational Study

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Background : Chronic Kidney Disease encompasses a spectrum of different pathophysiologic processes associated with abnormal kidney function and a progressive decline in glomerular filtration rate.

Materials and Methods : A hospital based observational study of one year duration was conducted in the Department of General Medicine, Silchar Medical College and Hospital with 100 Chronic Kidney Disease patients. The thyroid profile of the 100 patients with Chronic Kidney Disease patients was conducted .

Results and Observation : Age ranges from 30-59 years which were sub-grouped into three age groups [30-39 years, 40-49 years, 50-59 years]. Female patients were 52 in number constituting 52% whereas males were 48 in number constituting 48%. The study range of serum T3 is 11-171 ng/dl and the mean being 79.80 ng/dl (normal range is 80-180ng/dl). In our study 65 patients had low T3 syndrome, 50 patients had low T4 syndrome and 3 patients had Hypothyroidism.

Conclusion : As age increases the incidence of low T3 syndrome increases in our study. According to our study as age increases the severity of Chronic Kidney Diseases increases.

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Key words : Low T3, Chronic Kidney Disease, Thyroid Function.

Chronic Kidney Disease encompasses a spectrum of different pathophysiologic processes associated with abnormal kidney function and a progressive decline in glomerular filtration rate¹. CKD is a clinical syndrome that arises due to the loss of irreversible renal function and contributes to endocrine, excretory, metabolic, synthetic and excretory activity resulting in the accumulation of substances such as Non-protein Nitrogen products, resulting in metabolic disturbances resulting in some distinct clinical manifestations.

Chronic Kidney Disease is defined according to the presence or absence of markers of kidney damage and the level of Kidney Function (GFR), irrespective of Kidney Disease (the specific diagnosis).

(1) Kidney damage for ≥ 3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR, manifest by either,

(a) Pathological abnormalities or

(b) Markers of Kidney damage, including abnormalities in the composition of the blood or urine or abnormalities in imaging tests.

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Editor's Comment :

- Thyroid dysfunction is common in CKD patients and the severity of dysfunction increases with the progression of CKD.

AIMS AND OBJECTIVES

(1) Study of prevalence of Thyroid dysfunction in patients with Chronic Renal Failure.

(2) To correlate severity of Chronic Renal Failure and alteration of Thyroid indices.

MATERIALS AND METHODS

Study Setting :

The study was conducted in Department of General Medicine, Silchar Medical College and Hospital, Assam.

Study Period :

The current study was conducted among the Indoor patients in the Department of Medicine, Silchar Medical College over a period of one year from 1st June, 2019 to 31st May, 2020.

Study Design :

The present study is a Hospital based Observational Study.

Source of Data :

Patients with Chronic Kidney Disease admitted in Silchar Medical College and Hospital, Silchar, Assam

who were on conservative management as well as hemodialysis fulfilling the criteria of Chronic Kidney Disease.

Sample Size :

All patients admitted with Chronic Kidney Disease in the Department of General Medicine as inpatient of Silchar Medical College over a period of one year from 1st June, 2019 to 31st May, 2020 meeting the inclusion criteria and exclusion criteria and are willing to participate in the study.

RESULTS

In our study of 100 patients of CKD who were on conservative management including Hemodialysis fulfilling the criteria were studied, among them 48 were males and 52 were females and their age varied from 30 -59 years (Tables 1&2).

Age in Years	Total	
	Frequency	Percentage
30-39	16	16%
40-49	51	51%
50-59	33	33%
Total	100	100%

Sex	Frequency	Percent
Female	52	52%
Male	48	48%
Total	100	100%

Among the 100 patients in our study, 52 patients were females and 48 were males constituting respectively to 52% females and 48% males (Table 3).

In our study of 100 patients, 65 patients have low serum T3 levels (65%) in the different stages of CKD and 35 patients have normal serum T3 levels (35%) and patients of stage 5 disease have the highest number of patients with low serum T3 values with a statistically significant p value of <0.05. So in this study, majority of the population studied have low T3 syndrome with the mean value being 79.80.

DISCUSSION

The present study was aimed at to assess the prevalence of Thyroid Dysfunction in CKD and severity of Renal Disease. A large number of Hormonal Systems are affected by CRF, yet it remains unclear to what extent these changes are responsible for manifestations of Uremic Syndrome.

In our study, CKD patients on conservative management including Hemodialysis were studied. This is because thyroid profile undergoes changes due to dialysis independent of that due to Chronic Kidney Disease. Dialysis also changes the previous serum thyroid hormone status in patients with renal failure. Various studies have been studied by comparing CKD patients on conservative management and patients on Hemodialysis by Ramirez² and Kayima, *et al*³.

In our study of 100 patients who were on conservative management including Hemodialysis fulfilling the criteria of CKD were studied, among these 100 patients 52 were females and 48 were males and their age varied from 30-39 years. Among these 100 patients, patients of age group 30-39 years were 16, 40-49 years were 51, 50-59 years were 33 in number which constitutes a total of 100 patients.

Among the 100 patients, 52 were females constituting 52% and 48 were males constituting 48%.

In our study of 100 patients, 65 patients have Low serum T3 levels (65%) in the different stages of CKD, and 35 patients have Normal serum T3 levels (35%) and patients of stage 5 disease have the highest number of patients with Low serum T3 values with a statistically significant p value of <0.05.

So, in this study, majority of the population studied have Low T3 syndrome with the mean value being 79.80. So 65 patients had Low T3 syndrome in our study. The prevalence of Low T3 in stage 3A&B is 33% whereas in stage 4 is 51% and in stage 5 is 78.95%. This observation is consistent with Sang Heon Song, *et al*⁴ in which the prevalence of low T3 will be increased according to the increase in stage of CKD.

		CKD					Total	p Value	Significance
		GRADE 2	GRADE 3a	GRADE 3b	GRADE 4	GRADE 5			
TOTAL T3	NORMAL	2(100)	0(0)	6(66.67)	15(48.39)	12(21.05)	35(35)	0.001	Significant
	LOW	0(0)	1(100)	3(33.33)	16(51.61)	45(78.95)	65(65)		
Total		2(100)	1(100)	9(100)	31(100)	57(100)	100(100)		

As stated previously, HD and continuous ambulatory peritoneal dialysis have shown to affect the Thyroid profile independently of CKD. Also drugs like heparin, furosemide used during dialysis will affect the Thyroid profile. Kayima, *et al*^β and Giordano, *et al*^β have shown studies regarding effect of dialysis on CKD patients with Thyroid dysfunction. These studies showed no significant improvement in thyroid profile after repeated hemodialysis. But in the patients who have undergone Renal Transplant Surgery, most of the Thyroid function parameters returned to normal with TSH below normal.

CONCLUSION

It is concluded from the present study that the prevalence of Low T3 increases with age and the severity of Chronic Kidney Disease also increases as age increases.

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