ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 11 | November - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

THYROID PROFILE IN CHRONIC RENAL FAILURE.

General Medicine

Dr. Kodali Ram Praseen Postgraduate Department of General Medicine Alluri Sitarama Raju Academy of Medical Sciences Eluru 534005, West Godavari district Andhra Pradesh, India.

Dr. A. Ayyappa* Assistant Professor Department of Nephrology Alluri Sitarama Raju Academy of Medical Sciences Eluru-534005, West Godavari district Andhra Pradesh, India. *Corresponding Author

Dr. K .V. Chalapathi Rao Professor and HOD, Department of General Medicine, Alluri Sitararaju Academy of Medical Sciences Eluru - 534005, West Godavari district, Andhra Pradesh, India.

ABSTRACT

INTRODUCTION: Chronic Renal Failure is a clinical syndrome due to irreversible renal dysfunction leading to excretory, metabolic and synthetic failure culminating into accumulation of non-protein nitrogenous substances and present with various clinical manifestations. Various studies have been conducted on thyroid function in CRF patients. Since the beginning, the results were inconsistent. Hyperthyroidism, hypothyroidism and euthyroidism all have been reported.

AIMS AND OBJECTIVES: 1. To study the prevalence of thyroid dysfunction in patients with chronic renal failure.
2. To study the correlation between thyroid dysfunction and severity of renal diseases.
3. To differentiate primary thyroid diseases from thyroid dysfunction due to chronic renal failure.

MATERIALS AND METHODS: This study was done among 50 patients from August 2019 to July 2020 at Alluri Sitarama Raju Academy of Medical Sciences.

INCLUSION CRITERIA: 1. Symptoms of uraemia for 3 months or more
2. Elevated blood urea, serum creatinine and decreased creatinine clearance
3. Ultra sound evidence of chronic renal failure

EXCLUSION CRITERIA: 1. Patients underwent pereitoneal dialysis or hemodialysis
2. Nephrogenic range of proteinuria
3. Low serum protein especially albumin

RESULTS: 50 patients with CRF who were on conservative management were studied. Among 50 patients, 10 patients were female and 40 patients were male. The age varied from 12 – 70 years. Among 50 patients, 10 patients were 30 years and below, 33 patients were in the age group of 30 – 60 years and 7 patients above 60 years

CONCLUSION: Thyroid dysfunction occurs in 58% of the chronic renal failure patients. Incidence of hypothyroidism is increased in patients with chronic renal failure. Both clinical and biochemical parameters are essential to diagnose hypothyroidism in patients with CRF

KEYWORDS

INTRODUCTION:

Chronic Renal Failure is a clinical syndrome due to irreversible renal dysfunction leading to excretory, metabolic and synthetic failure culminating into accumulation of non-protein nitrogenous substances and present with various clinical manifestations. End stage renal disease is described as a terminal stage of chronic renal failure that without replacement therapy would result in death. Patients with CRF have many signs and symptoms suggestive of thyroid dysfunction like sallow complexion, edema, dry skin, cold intolerance, decreased BMR, asthenia and hyporeflexia. So in cases of CRF, it is difficult to exclude thyroid dysfunction on mere clinical background.

Various studies have been conducted on thyroid function in CRF patients. Since the beginning, the results were inconsistent. Hyperthyroidism, hypothyroidism and euthyroidism all have been reported.

The relation between thyroid dysfunction and severity of CRF is not clear. Several previous studies debit conflicting results both positive and negative. Prevalence of hypothyroidism in end stage renal disease (ESRD) have been estimated between 0 and 9%. There is also increased prevalence of goiter in patients with ESRD.

AIMS OF THE STUDY:

1. To study the prevalence of thyroid dysfunction in patients with chronic renal failure. 2. To study the
2. correlation between thyroid dysfunction and severity of renal diseases. 3. To differentiate primary thyroid diseases from thyroid dysfunction due to chronic renal failure

MATERIALS AND METHODS:

Patients admitted to the GENERAL MEDICINE department in Alluri Sitarama Raju Academy of Medical Sciences with chronic renal failure who are on conservative management.

Study design:

Single Centre, Non randomized prospective study, Study was conducted between August 2019 and July 2020 for a period of 12 months.

Sample size: 50 patients were included in this study.

INCLUSION CRITERIA:

1. Symptoms of uraemia for 3 months or more
2. Elevated blood urea, serum creatinine and decreased creatinine clearance
3. Ultra sound evidence of chronic renal failure

EXCLUSION CRITERIA:

1. Patients underwent pereitoneal dialysis or hemodialysis
2. Nephrogenic range of proteinuria
3. Low serum protein especially albumin

Criteria for Chronic Renal Failure

1. Symptoms of uraemia for 3 months or more
2. Elevated blood urea, serum creatinine and decreased creatinine clearance.
3. Ultra sound evidence of chronic renal failure a. Bilateral contracted kidneys – size less than 8 cm in male and size less than 7 cm in female b. Poor corticomedullary differentiation c. Type 2 or 3 renal parenchymal changes
4. Supportive laboratory evidence of CRF like anemia, low specific gravity, changes in serum electrolytes, etc.,
5. Radiological evidence of renal osteodystrophy

RESULTS AND OBSERVATIONS:

50 patients with CRF who were on conservative management were studied. Among 50 patients, 10 patients were female and 40 patients were male. The age varied from 12 – 70 years. Among 50 patients, 10 patients were 30 years and below, 33 patients were in the age group of 30 – 60 years and 7 patients above 60 years.

Observation regarding CRF in this study:
The duration of CRF in this study varied from 3 months to 5 years. The Creatinine clearance varied from 6 ml/min to 34 ml/min. 20 patients had GFR10 ml/min accounting for 40%, 20 patients GFR 11 – 20 ml/min accounting for another 40%, remaining 10 patients accounting for 20% had GFR more than 20 ml/min.

Blood urea varied from 64 to 170 mg/dl and Creatinine varied from 3 mg to 17.2 mg/dl. 24 hours urinary protein excretion was less than 1 gm/day in all the patients in this study group.

Serum calcium and phosphorous were normal in all the patients. 80% of the patients had anaemia with peripheral smear revealing normocytic normochromic anaemia in 72% and hypochromic anaemia in 8% of the patients.

ANALYSIS OF HYPOTHYROID SYMPTOMS IN CRF

Variants	No. of patients with symptoms	Percentage
Low T_3 Syndrome (n=23)	17	73.91%
Hypothyroidism (n=5)	5	100%
CRF without thyroid dysfunction (n=22)	13	59.09%

DISTRIBUTION OF LOW T_3 AND T_4 SYNDROME IN THIS STUDY

Creatinine Clearance ml/min	Low T_3 Syndrome		Low T_4 Syndrome	
	No. of Patient	Percentage	No. of patient	Percentage
≤ 10	13	65%	6	30%
11 – 20	7	35%	3	15%
> 20	5	30%	1	10%

Observation of TSH in the study:
Values of TSH vary from 0.6 to 27 µIU/ml with mean value in 6.53 µIU/ml. Excluding hypothyroidism mean value is 4.75 µIU/ml. This shows normal serum level of TSH.

Among the 50 patients, TSH was normal in 38 patients (76%) and values between 7.1 – 20 µIU/ml in 7 patients (14%). It was elevated more than 20 µIU/ml in 5 patients (10%).

According to our study, in patients with low T3 syndrome, the mean values of TSH in various stages of renal failure are within normal range. But the values of TSH didn't show any linear correlation with GFR.

DISCUSSION:
Thyroid dysfunction in CRF was extensively studied by Ramirez.
Apart from his study, various studies conducted in this line have showed different results. In our study, patients only on conservative management were studied. This is because thyroid profile undergoes changes due to dialysis independent of that due to chronic renal failure. Dialysis also changes the previous serum status of thyroid hormone in the patients with renal failure. Many studies have conducted by comparing CRF patients conservative Management and Hemodialysis by Ramirez.

Mean T4 level in our study is within normal limits in all levels of GFR, but it is in low normal level and also it does not correlate with the severity of renal failure. In our study, not all the patients with CRF have low T3 and T4. It is estimated that only 58% (29 patients) of patients have Thyroid Profile abnormality. Remaining 42% of patients have normal thyroid profile. Among 58% of these patients exclude primary hypothyroid patIents have normal thyroid profile.

Among 58% of these patients exclude primary hypothyroid patients 28% have only low T3 level with normal T4 level. Remaining 20% have both low T3 and T4 level. The percentage of patients having low T3 and T4 gradually increase, with decrease in GFR.

The patient who will develop such change in thyroid profile is not known. Excluding hypothyroidism, mean TSH level in our study is within normal limits. The mean TSH levels are also within normal limits for the various ranges of GFR. But TSH level doesn't show any linear correlation with the severity of renal failure.

CONCLUSIONS:
1. Thyroid dysfunction occurs in 58% of the chronic renal failure patients.
2. Incidence of hypothyroidism is increased in patients with chronic renal failure.
3. Both clinical and biochemical parameters are essential to diagnose hypothyroidism in patients with CRF.
4. Excluding patients with hypothyroidism T3 level is low in 46% of the patients, T4 level is low in 20% of the patients.
5. Number of patients with low T3 and T4 syndrome progressively increase with severity of renal failure. 6 Serum level of T3 and T4 has no correlation with the severity of renal failure.
6. Alteration in the values of T3 and T4 occurs as a part of body adaptations mechanism to conserve energy.

REFERENCES:

1. Avasthi G et al, (2001) Study of Thyroid function in patients of chronic renal failure. Indian Journal of Nephrology, 11:165 – 170.
2. Beckett G et al, (1983). Thyroid status in patient with chronic renal failure. Clinical Nephrology, 19: 172 – 8.
3. Bartalena L et al, (1990). Lack of nocturnal serum Thyrotropin surge in patients with chronic renal failure undergoing regular maintenance hemofiltration; a case of central hypothyroidism. Clinical Nephrology, 34: 30 – 4.
4. Biersack HJ et al, (1976), Thyroid hormones and thyrotropin in liver and kidney insufficiency. J Nuclear Medicine 15: 135 – 7.
5. Carter JN et al, (1977). Effects of triiodothyronine administration in patients with chronic renal failure. AUST NZ J Med, 7:612 – 6.
6. Custro N et al, (1992). Prospective study on thyroid function anomalies in seriously ill patient. Ann Ital med Int 7:13 – 8.
7. Dandona P et al, (1976). Thyroid function in chronic renal failure. Proc Eur Dial transplant Assoc, 12:268 – 71.
8. Davidson's Principle and Practice of Medicine, 18th Edition. The thyroid gland.