Study of Inorganic Iodine Level in Renal Transplant Recipients

Thesis

Submitted for Partial Fulfillment of Master Degree in Internal Medicine

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Samir El Sayed

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List of Abbreviations

Abb.	Full term
AIH	*Amiodarone -Induced Hypothyroidism*
AIT	*Amiodarone-Induced Thyrotoxicosis*
BP	*blood Pressure*
CHD	*Chronic Heart Disease*
CKD	*Chronic Kidney Disease*
CO	*Cardiac Output*
CVD	*Cardiovascular Disease*
DIT	*Diiodityrosine*
ECF	*Extracellular Fluid*
ESRD	*End-Stage Renal disease*
FT3	*Free Triiodothyronine 3*
GFR	*Glomerular Filtration Rate*
HCV	*Hepatitis C Virus*
I	*Iodine*
ICM	*Iodinated Contrast Medium*
IFN	*Interferon*
IIT	*IFN-Induced Thyroiditis*
IQR	*Interquartile Range*
MIT	*Monoiodotyrosine*
PCT	*Proximal Convoluted Tubules*
PVP-I	*Povidone-Iodine*
RBF	*Renal Blood Flow*
rT3	*Reverse Triiodothyronine*
T/S	*Thyroid / Serum*
T3	*Triiodothyronine*
T4	*Thyroxine*

List of Abbreviations (Cont...)

Abb.	Full term
TBA	*Thyroxine Binding Albumin*
TBG	*Thyroxine Binding Globulin*
TBPA	*Thyroxine Binding Prealbumin*
TH	*Thyroid Hormones*
TPO	*Thyroid Peroxidase*
TSH	*Thyroid Stimulating Hormone*

ABSTRACT

All subjects were subjected to full history taking (including transplantation history), full clinical examination (including examination of the neck, eye signs and symptoms suggestive of hypothyroidism or hyperthyroidism), *laboratory investigations including*: CBC, Creatinine, urea, sodium, potassium, calcium, Phosphorus, Serum albumin, estimation of level of serum inorganic iodine, estimation of free T3 & free T4, TSH levels and thyroid ultrasound.

This study included 30 males and 20 females with median age 37 years. We found iodine level was significantly higher in transplant recipients than in control group.

We found that free T3was significantly lower in transplant recipients than control group.

As regard Ultrasonographic findings of the thyroid gland: there was higher prevalence of thyroid nodules in transplant group.

Keywords: Thyroid Peroxidase - Thyroxine Binding Prealbumin- Proximal Convoluted Tubules- Cardiovascular Disease- Chronic Kidney Disease

INTRODUCTION

Thyroid hormones influence renal development, kidney structure, renal hemodynamics, glomerular filtration rate, the function of many transport systems along the nephron, and sodium and water homeostasis ***(Ponsoye et al., 2013).***

Effects of hypothyroidism and hyperthyroidism on kidney function are the result of direct renal effects, as well as systemic hemodynamic, metabolic, and cardiovascular effects. Most of the renal manifestations of thyroid disorders, which are clinically most significant with hypothyroidism, are reversible with treatment. Patients with hypothyroidism can have clinically important reductions in GFR, so screening for hypothyroidism should be considered in patients with unexplained elevations in serum creatinine. Patients with thyroid disorders are also at risk for immune-mediated glomerular diseases ***(Ponsoye et al., 2013).***

Patients with nephrotic syndrome, as well as acute and chronic kidney diseases, have alterations in thyroid gland physiology that can impact thyroid function and the testing of thyroid function status. Dialysis patients have frequently hypothyroidism whose biological diagnosis must be careful ***(Ponsoye et al., 2013).***

Functional thyroid gland disorders were more common among renal transplant patients compared with healthy

subjects, and reveal their link with time on dialysis. A significant link was found between subclinical hypothyroidism with decreased level of T3 and higher incidence of low T3 syndrome in the transplant renal patients compared to control group. It is necessary to screen thyroid hormone levels in these patients periodically in order to check thyroid gland function and to assess the relationship between thyroid dysfunction and mortality risk ***(Halilcevic et al., 2015).***

The most common thyroid imbalance in renal transplant patients is a low T3 syndrome with FT3 levels generally within the normal limits. This reduction is associated with reduced peripheral conversion of T4 to T3, systemic acidosis, the length of dialysis and markers of endothelial dysfunction and inflammation. Total and free T3 are acting as markers of survival after renal transplantation. There are reports which concluded that low serum T3 levels before renal transplantation are associated with decreased graft survival ***(Halilcevic et al., 2015).***

Because of the high incidence of thyroid dysfunction in transplant patients, screening of thyroid function should be a part of follow-up. On the other hand, although frequency of nodules is increased in kidney transplant patients, prevalence of thyroid cancer is slightly, but not significantly, higher than that of the normal population ***(Gungor et al., 2010).***

Significantly more abnormal thyroid gland structures were observed among dialyzed or transplanted patients.

Significant transient decrease in TSH and FT_3 and not FT_4 concentrations is present following kidney transplantation. Occasionally, increase accompanied by a change in FT_4 and TSH concentrations were observed, and antithyroid antibodies were detected only sporadically ***(Junik et al., 2003).***

Low serum T3 concentration in patients with uremia before transplantation may have protective effects against the hypercatabolic uremic state and ischemia-reperfusion injury early after engraftment ***(Hekmat et al., 2011).***

A high prevalence of abnormal thyroid morphology was found in patients after a successful renal transplantation, being partly related to a previous uremia. Abnormalities in the thyroid function are likely an expression of the post-transplant general and immunological conditions. Endocrinological follow-up is advisable in patients after renal transplantation, in order to discriminate thyroid dysfunctions which need specific treatments from those that can only be followed-up, avoiding inappropriate treatments of biochemical abnormalities ***(Tauchmanovà et al., 2006).***

The FT3 level and thyroid volume correlates with kidney transplant function. The supplementary thyroid hormones administration should be considered before and after renal transplantation ***(Łebkowska et al., 2004).***

Aim of the Work

To assess the level of inorganic iodine in renal transplant recipients and its possible relation to thyroid function tests and thyroid ultrasound.