Radioiodine Therapy for Hyperthyroidism in a Patient with End-Stage Renal Disease on Hemodialysis: Case Report

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INTRODUCTION

End-stage renal disease (ESRD) is characterized by irreversible loss of renal function that affects multiple systems. Renal failure affects thyroid function by decreasing circulating thyroid hormone concentration, disturbing the binding of the hormone to the carrier protein, and increasing iodine storage in thyroid gland (1).

In ESRD patients, hypothyroidism is generally seen, whereas hyperthyroidism is rare (2). The incidence of hyperthyroidism in haemodialysis patients is similar to that of the general population but treating the patient with 131 I while on dialysis is quite rare (3). The physician must bear in mind the possibility of toxic nodular goiter (TNG) in ESRD patients on haemodialysis.

The medical treatment choices of hyperthyroidism in haemodialysis patients with ESRD, are antithyroid drugs and radioiodine therapy (RAI). Because RAI is cleared mainly by the kidneys, the radioiodine dose given and the timing of haemodialysis sessions must be taken into consideration (4).

CASE REPORT

A 56-year-old woman with ESRD and undergoing maintenance haemodialysis for four years was admitted to our hospital complaining of palpitations and fever. In her clinical examination a right thyroid lobe mass was
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REFERENCES


DISCUSSION

The kidney has an important role in the metabolism, degradation and excretion of thyroid hormones. End-stage renal disease (ESRD) is characterized by irreversible loss of renal function and has effect on multiple systems, including endocrine system (1).

Hyperthyroidism is an entity that is rarely seen in ESRD. Despite extensive studies, thyroid status in uremia is still inconclusive due to the complexity of the system studied (1). In ESRD patients, radioiodine excretion is primarily by dialysis, as residual renal function is minimal or absent (4). In this case, we present an ESRD patient with hyperthyroidism who is receiving haemodialysis treated with radioiodine therapy. The experience in managing patients with RAI on dialysis is limited (5). To avoid from excessive radiation exposure, dosage of RAI should be appropriately calculated. In the literature, the calculation of treatment dose in ESRD patients is generally done with empiric methods. Several studies recommend reduction of RAI dose to less than 40% in chronic renal failure patients with thyroid carcinoma (6-13). Holst et al suggested that the treatment dose of (131)I for a patient with thyroid cancer on hemodialysis would be approximately 13%-28% of a typical empiric dose of (131)I for a patient with normal renal function (6). In our case, the dose of RAI was 50% of a typical empiric dose of RAI for a patient with normal renal function.

In conclusion; RAI therapy can be performed safely and effectively in patients suffering from end-stage renal disease undergoing dialysis with special precautions.