

# Haemodialysis treatment for patient undergoing radioiodine therapy for Thyroid Cancer

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## Introduction

ESRD patients are more likely to have Thyroid Carcinoma than the general population. The treatment is Thyroidectomy with Neck Dissection when needed. If after the surgery, malignant cells are still present the treated is radioactive iodine – I 131. I 131 is cleared in the kidneys. Therefore it is clear that ESRD patients need special attention with the amount of I 131 needed, timing and amount of Dialysis treatment. In addition, preparations for the treatment must include protocols how to protect the staff involved from radiation, How to protect and re-qualify the dialysis machine for all patients, ways to drain the radioactive dialysate, and preparations for emergencies.

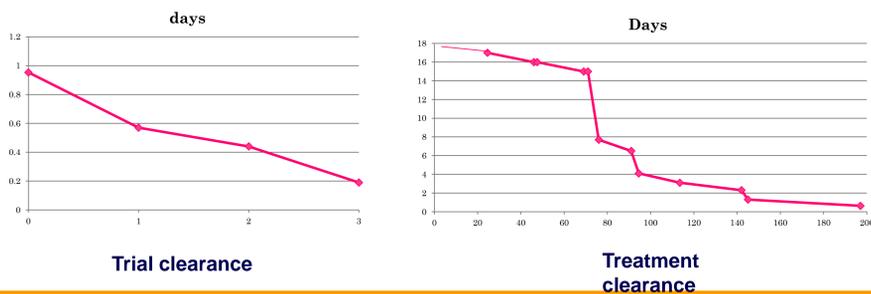
Lancet. 1999 Jul 10;354(9173):93-9. Endocr Rev. 1996 Feb;17(1):45-63.

## I131 treatment

- ❖ The purpose of the I131 treatment is to expose the malignant left over cells after the operation to maximum Radiation with minimum exposure to the rest of the body.
- ❖ The I131 is cleared from the body through the kidneys.
- ❖ After taking the I131 pills, patients with healthy kidneys are isolated in their homes.
- ❖ Patients with ESRD need to stay in the hospital in an isolated room with lead walls, where they also have their hemodialysis treatments.

## Dialysis prescription

- ❖ I 131 mapping with low dosage of 5 milikiri to identify the clearance time of radioactivity. This helps to decide on the treatment dosage of I 131
- ❖ A full dialysis treatment was done just before the I 131 was taken.
- ❖ First dialysis was done 72 hours later.
- ❖ Following treatments were done every second day
- ❖ The patient was released from the hospital after 6 days with 3.1 milirentgen.



## Equipment protection

- ❖ Dialysis machine and RO should be covered with thick nylon
- ❖ Drainage of dialysate directly to special drainage of radioactive waists
- ❖ There was no direct contact of the blood and the machine therefore the residual radiation was minimal and the machine was back for regular treatments after a short time after internal radiation monitoring.
- ❖ The room itself was contaminated was the same as from patients without ESRD



## Background

- ❖ Female patient age 55
- ❖ Hypertension, Bipolar Disorder, Obesity
- ❖ ESRD due to Lithium Therapy
- ❖ Treated with Haemodialysis since December 2008 3 t/w, 4h each treatment
- ❖ During preparations for Kidney transplant a tumor was found in the Thyroid
- ❖ U.S. - Suspicious mass in the Thyroid size 10 mm
- ❖ FNA – Papillary Carcinoma
- ❖ **Diagnosis - Papillary Thyroid Carcinoma Numerous positive lymph nodes in neck – stage 3**
- ❖ July 2009 Thyroidectomy and Neck dissection
- ❖ Feb. 2010 I 131 Treatment

## Staff protection

- ❖ Usage of Lead shield by the dialysis nurse
- ❖ Minimal exposure time – maximum 2h. We had CCTV in the room directed to the patient so the nurse could stay outside the room most of the dialysis treatment.
- ❖ Exposure distance of 2m.
- ❖ Usage of precautions like gloves, hat, gown, mask.
- ❖ Usage of radiation dosimeter by the staff
- ❖ After 3-4 treatments no protection is needed

## Emergencies preventions

- ❖ Psychiatric evaluation of the patient prior to the I 131 treatment to know if the patient will be able to stay in isolation for several days
- ❖ CCTV in the room 24h/d
- ❖ Resuscitation equipment in the room (עגלת החייה)
- ❖ Blood samples and radiation levels were measured each day

## conclusions

Treatment of ESRD patients with Thyroid cancer who need Radioactive Iodine treatment is not simple, but is possible. In order to achieve the best results for the patient and prevent personnel and environmental damage, a multidisciplinary approach including – Nephrologists, Oncologists, Radiologists, endocrinologists, dialysis nurses and radiation technicians is obligatory.

Short term effect of the treatment like Radiation Thyroiditis, nausea and vomiting and throat pains did not occur, unfortunately, long term effect like damage to bone marrow did happen. Therefore we recommend to do the first dialysis 48h after the I 131 intake.

Our preparations for staff and equipment protection were excellent and neither of them was injured or damaged.