

# INFLUENCE OF IODINATED CONTRAST MEDIA ON THYROID AND RENAL FUNCTION IN PATIENTS WITH CHRONIC KIDNEY DISEASE.

D. Brodowska-Kania<sup>1</sup>, A. Paturej<sup>1</sup>, K. Szamotulska<sup>2</sup>, M. Wojciechowska<sup>3</sup>, M. Dzierżanowska<sup>3</sup>, Z. Bartoszewicz<sup>4</sup>, S. Niemczyk<sup>1</sup>

1. Department of Internal Diseases, Nephrology and Dialysis, Military Institute of Medicine, Warsaw, Poland

2. Department of Epidemiology, Institute of Mother and Child, Warsaw, Poland

3. Department of Laboratory Diagnostics, Military Institute of Medicine, Warsaw, Poland

4. Department of Internal Medicine and Endocrinology Medical University of Warsaw, Warsaw, Poland.

Key words: contrast media, contrast induced nephropathy, thyroid gland, hypothyroidism.

## INTRODUCTION AND AIMS:

Occurrence of contrast induced nephropathy (CIN) is underestimated and varies. Administration of radiological contrast media (CM) exposes the body cells to a high dose of iodine, which exceeds the recommended daily allowance of iodine. No data in literature is available to show how the thyroid gland reacts in CKD and patients treated with renal replacement therapy(RRT).

The aim of our study was to assess the risk and incidence of CIN in patients with CKD, the impact of iodine CM on the endocrine function of the thyroid gland and the impact of renal impairment on the risk of contrast-induced hypothyroidism or hyperthyroidism.

## METHODS:

The study included 75 patients(pts). The first group consisted of 36 patients with CKD and eGFR<60ml/min. (CKD-Group, mean age 69.4±11, male prevalence 72.2%). The second group consisted of 20 chronically dialysed patients (RRT-Group, Mean age 63.7±12.2, male prevalence 50%). The control group consisted of 19 patients with eGFR>60 ml/min (CT-group, mean age 48.2±18.0, male prevalence 57.9%). Measures of CIN prevention were conducted among all patients: hydration and N-acetylcysteine. All patients received CM of low molarity (iomeprol or iohexol). Patients were monitored for 6 months after the administration of CM in a total of 3 follow-up visits (48 hours, 14 days and 6 months after contrast administration). During those visits values of creatinine, urea, eGFR, cystatin C, TSH, free-T3(fT3), free-T4(fT4), reverse-T3(rT3), were monitored. Risk factors of CIN were evaluated: age over 75 years old, creatinine concentration 1,5mg/dl, diabetes, anaemia as defined by WHO (Hgb <13g% among males and <12g% in females). The results were statistically analyzed. Study was approved by the Ethics Committee.

## RESULTS:

AKI was found in 2.7% in test group (3 pts). In the CKD group, the mean creatinine was 1.65mg / dl (1.33-2.28), eGFR 39.91 ± 12.89, cystatin C 2.17mg / dl ± 0.83, urea 67.7mg / dl ± 27.55. Increase in creatinine value was not statistically significant ( $\Delta$ CREA 0.2 p = 0.8,  $\Delta$ cystatin C-0.04, p = 0.891, and  $\Delta$ eGFR = 0.62, p = 0.912 within 48 hours after administration of CM.

In the CKD group two weeks after administration of CM a decrease fT3,  $\Delta$ fT31CKD -0.39 ± 0.77 p1CKD = 0.004. changes fT3 persisted during the 6 months follow-up ( $\Delta$ fT32CKD = -0.36 ± 0.91 p2CKD = 0.023). The changes of  $\Delta$ fT3 were no correlation with dose of CM and eGFR.

In the group of RRT a change of  $\Delta$ fT41RRT 1.58 ± 2.56 p1RRT = 0.013 was observed after 2 weeks, which maintained for 6 months ( $\Delta$ fT42RRT 2.0 ± 3.38 p2RRT = 0.016).

In the control group the changes were minimal and not statistically significant. No thyroid dysfunction was observed.

## CONCLUSIONS:

After appropriate patient preparation, adverse effects of intravenous administration of iodine contrast are rare. The incidence of CIN in the group with CKD is 2.7%. Contrast media have no adverse effect on kidney and thyroid function among patients with good function of these organs. CKD is not a risk factor for contrast-induced hyperthyroidism or hypothyroidism. Changes in thyroid hormones were statistically significant but asymptomatic. Therefore, it is possible, that there is no need to test TSH before the administration of contrast media among patients with normal thyroid function and CKD.



WOJSKOWY INSTYTUT MEDYCZNY