УДК 61:615.1(043.2)
ББК 5:52.82
ISBN 978-985-21-0251-3

Konończuk K.

CAN KIM-1 BE A USEFUL BIOMARKER FOR THE DIAGNOSIS OF CHRONIC KIDNEY DISEASE IN CHILDHOOD CANCER SURVIVORS?

Scientific supervisor Eryk Latoch, PhD
Department of Pediatric Oncology and Hematology
Medical University of Bialystok, Poland

Introduction: Nephrotoxic drugs used in anticancer treatment have a toxic influence on kidney cells. KIM-1 (Kidney Injury Molecule-1) is transmembrane glycoprotein type 1 composed from an extracellular part which is a quantitative marker of renal injury. In a healthy kidney KIM-1 is undetectable in urine. There is observed an increased expression and synthesis of KIM-1 when a kidney is exposed to hypoxia or damage of a proximal renal tube.

Aim: The evaluation and comparison of the KIM-1 levels in childhood cancer survivors treated with different treatment protocols.

Materials and methods: The study group included 81 patients (male: 38, female: 43). The mean age at the time of study was 14.55 ± 5.10 years. The mean age after completed treatment was 6.45 ± 3.65 years. The study group was divided into two groups: patients treated for leukemia and Non-Hodgkin lymphoma (NHL) (n= 56; 69.14%), and solid tumors (n= 25; 30.86%). Nephrectomy was performed in 10 patients. KIM-1 protein was measured by ELISA. The Mann-Whitney U test was used. The statistical significance was defined as $p<0.05$.

Results and discussion. There was no significant difference in KIM-1 levels between the two groups. The mean level of KIM-1 was 0.87 ng/ml (0.55; 1.56) vs. 0.82 ng/ml (0.56; 1.24) (p= 0.67); urine albumin 3.00 mg/l (3.00; 15.25) vs. 4.30 mg/l (3.00; 30.80) (p= 0.58); GFR 113.03 ml/min/1.73 m2 (98.80; 135.91) vs. 122.06 ml/min/1.73 m2 (102.00; 143.18) (p= 0.61) respectively. GFR was below the range norm for the given age in 23.46% of patients. KIM-1 was detected in 97.77% of patients and 43.21% of them had the level of KIM-1 higher than 1 ng/ml. There was no correlation in the levels of GFR and KIM-1 (rs= -0.047; p= 0.697). However, urine albumin and KIM-1 correlated positively (rs= 0.274; p< 0.05) in all patients. Patients were treated due to leukemia and NHL - urine albumin and KIM-1 (rs= 0.211; p= 0.118), solid tumors - urine albumin and KIM-1 (rs= 0.469; p< 0.05).

Conclusions: Almost 24% of patients had GFR below the norm range for the given age. There were no significant differences in KIM-1 levels in patients treated for leukemia, NHL and solid tumors in the first decade after completion of treatment. Due to detectable level of KIM-1 nearly in whole group, the function of the urinary tract in childhood cancer survivors should be regularly monitored for early detection of renal damage.