

## Evaluasi kadar kidney injury molecule-1 kim-1 dan neutrophil gelatinase associated lipocalin ngal dalam urin untuk mendeteksi gangguan fungsi ginjal pada pasien kanker nasofaring dengan kemoterapi berbasis sisplatin = Evaluation of urinary kidney injury molecule 1 kim 1 and neutrophil gelatinase associated lipocalin ngal levels to detect kidney dysfunction in patients with nasopharyngeal cancer treated with cisplatin based chemotherapy

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### Abstrak

Latar belakang Sisplatin merupakan pengobatan utama untuk karsinoma nasofaring KNF , tetapi berpotensi menimbulkan nefrotoksisitas. Selain kadar BUN dan kreatinin serum, KIM-1 dan NGAL diduga cukup sensitif untuk mendeteksi nefrotoksisitas. Penelitian ini bertujuan untuk mengevaluasi kadar KIM-1 dan NGAL dalam urin untuk mendeteksi gangguan fungsi ginjal pada pasien KNF stadium lanjut yang mendapatkan kemoterapi berbasis sisplatin.

Metode: Penelitian ini merupakan penelitian kohort prospektif. Subyek penelitian dibagi dalam 3 kelompok: pasien yang belum pernah terpapar dan yang sudah pernah mendapatkan kemoterapi berbasis sisplatin 75-100 mg/m<sup>2</sup> serta pasien yang belum pernah mendapatkan kemoterapi sisplatin dan kemudian diberi sisplatin 40 mg/m<sup>2</sup> . Kadar KIM-1, NGAL dalam urin serta kadar BUN dan kreatinin dalam serum diukur pada saat sebelum dan sesudah mendapatkan sisplatin pada ketiga kelompok. Analisis statistik yang digunakan adalah uji ANOVA, uji Pearson, Spearman, Kolmogorov-Smirnov dan SPSS versi 22,0.

Hasil: Terdapat perbedaan selisih kadar BUN yang bermakna antara sebelum dan sesudah diterapi pada ketiga kelompok  $p=0.0001$  . Perbedaan selisih kadar NGAL dalam urin pada penelitian ini juga berbeda bermakna antara sebelum dan sesudah diterapi terhadap ketiga kelompok  $p=0,025$  , tetapi ada perbedaan rerata pada sepasang kelompok yang bermakna hanya didapatkan pada kelompok yang belum pernah dikemoterapi 40 mg/m<sup>2</sup> dan kelompok yang sudah pernah diberi kemoterapi 75-100 mg/m<sup>2</sup>  $p=0,02$ . Perbedaan selisih kadar KIM-1 tidak bermakna pada ketiga kelompok  $p=0,275$ .

Kesimpulan: Sisplatin menunjukkan akumulasi nefrotoksisitas yang tergantung pada dosis dose-dependent manner . Pengukuran kadar NGAL dalam urin dapat mendeteksi nefrotoksisitas tahap dini, tetapi belum bisa menggantikan peran BUN. Pengukuran kadar KIM-1 dalam urin tidak dapat mendeteksi gangguan fungsi ginjal.

<hr>Background: Cisplatin is the main treatment for nasopharyngeal carcinoma NPC with a potency of causing nephrotoxicity. In addition to serum BUN and creatinine levels, KIM 1 and NGAL levels is assumed to be quite sensitive in detecting nephrotoxicity. The study was aimed to evaluate urinary KIM 1 and NGAL level to detect kidney dysfunction in patients with advanced stage NPC who received cisplatin based chemotherapy.

**Method:** The study was a cohort prospective study. Subjects were categorized into 3 groups, i.e. patients who had never received and who had received 75 100 mg m<sup>2</sup> cisplatin based chemotherapy as well as those who had never received any cisplatin based chemotherapy and were subsequently received 40 mg m<sup>2</sup> cisplatin. The levels of urinary KIM 1, NGAL and serum level of BUN and creatinine were measured before and after receiving cisplatin in the three groups. Statistical analysis used in our study were ANOVA, Pearson, Spearman, KolmogorovSmirnov test and SPSS version 22.0.

**Results:** There was a significant difference of delta BUN level before and after treatment in all three groups p 0.0001 . Delta urinary NGAL level was also significantly different between before and after treatment in all groups p 0.025 however, a significant mean difference of a pair group was only found between those who never had 40 mg m<sup>2</sup> chemotherapy and those who had received 75 100 mg m<sup>2</sup> chemotherapy p 0.02 while delta KIM 1 level showed no significant difference in all three groups p 0.275.

**Conclusion:** Cisplatin may cause accumulated nephrotoxicity, which has dosedependent manner. Measuring urinary NGAL level can detect an early stage of kidney dysfunction however, it still cannot replace the role of BUN. Measurement of urinary KIM 1 level cannot detect kidney dysfunction.