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Research Article

Amelioration of Cisplatin-Induced Kidney Injury by *Pometia pinnata*

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ABSTRACT

Introduction: Cisplatin is one of the most effective anticancer drugs. But using cisplatin can cause very serious nephrotoxicity and acute kidney injury (AKI). Pometia pinnata (PE) or commonly referred to as matoa is a typical plant, especially Papua, Indonesia. Pometia pinnata belongs to the Sapindaceae family. This study aimed to determined the nephroprotective activity of the extract ethanol pometia pinnata on rats induced cisplatin. **Methods:** 30 rats are divided into six groups, each group were contained 5 rats. Group I was a normal group which rats only given CMC (carboxy methyl cellulose). Group II was a negative group which rats injected 7 mg / kgbw of Cisplatin in day 3. Group III was a positive group which rats given vitamin C 1% from day 1 to 7 and in day 3 rats were injected cisplatin. Group IV-VI were extract groups (100 mg / kgbb, 200 mg / kgb, 400 mg / kgbb) which rats orally given extract from day 1 to 7 and in day 3 rats were injected cisplatin. On day 8 rats were injected ketamine 1% which directly took the blood from the heart. **Results:** The result shows that EEPE on rats biochemical parameters including urea, creatinine, uric acid. Group II showed that there was a significant increase (p <0.05) compared to the normal group that was not given cisplatin and extracts. Whereas in the group given the extract in groups IV, V, and VI there was a reduction in biochemical parameters because the Pometia leaf extract had high antioxidant activity so that it had nephroprotective activity. extract ethanol pometia pinnata can reduced the level of sodium, potassium and chloride of each group after receiving cisplatin. Statistically group II that only given cisplatin has significantly different with group I (p<0,05) and also statically different with group VI (p<0,05).

Key words: Cisplatin, Pometia pinnata, Kidney injury.

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INTRODUCTION

Cisplatin (cis-diamminedichloroplatinum II, CDDP) is one of the most effective anticancer drugs. But using cisplatin can cause very serious nephrotoxicity and acute kidney injury (AKI). Nearly 30-40% of cisplatin use in patients causes neprotoxicity as a result of CDDP accumulation and kidney biotransformation. Until now, only amifostine is widely used as a nephroprotective agent during cisplatin treatment but has side effects such as hypocalcemia, hypotension, and vertigo. Cisplatin can increase biomarkers of kidney damage such as KIM-1 (Kidney injury molecule-1), cystatin C and NGAL (Neutrophil gelatinase)[1-4].

Two of the largest clinical manifestations of nephrotoxicity due to the use of cisplatin is acute renal failure (20-30%) and hypomagnesemia (40-100%). Acute renal failure can be detected by an increase in Blood Urea Nitrogen (BUN) and serum creatinine. Dialysis costs are expensive and weaknesses of cisplatin chemotherapy supportive therapy that has been provided at this time to encourage research on other materials that can be used as chemoprotective agents to prevent and reduce the use of cisplatin nephrotoxicity[5,6].

The main mechanism of cisplatin is an agent becomes activated intracellularly by akuasi one of two groups chloride groups and then covalently binds to DNA, forming a DNA adduct. This process activates various signal transduction pathways, for example, in DNA-damage recognition and repair, cell cycle arrest, and programmed cell death / apoptosis.[7] However, the clinical success of cisplatin is limited because of severe side effects and intrinsic or acquired resistance during treatment. Unfortunately, resistance has limited the effectiveness of these agents in most diseases. Resistance to platinum-based chemotherapy can be intrinsic or acquired and may be mediated by factors outside or inside cancer cells or on the cell membrane.[8,9] The toxicity due to the use of cisplatin is very dangerous, so that in its use, additional therapy is needed, both traditional and modern. Traditional therapy is often used by people, especially in Indonesia, one of which is the use of herbs.

Pometia pinnata (PE) or commonly referred to as matoa is a typical plant, especially Papua, Indonesia. Pometia pinnata belongs to the Sapindaceae family. Matoa fruit has a characteristic and combined taste of rambutan, longan and a little durian taste. PE is cultivated by local people because it has economic value. There is very little research on pometia pinnata, such as the study conducted by Ni wayan, which revealed that the ethanol extract of matoa leaves has strong antioxidant activity, qualitative phytochemical screening shows that the ethanol extract of matoa leaves contains flavonoids and tannins.[10,11] Another study reported that the ethanol extract of the matoa fruit peel contains strong antioxidant activity and has antibacterial activity by inhibiting the bacteria Escherichia coli, Bacillus cereus and Staphylococcus aureus. Another study also revealed that the ethanol extract of the matoa fruit peel contains high levels of phenols and flavonoids compared to gallic acid and quercetin.[12,13] This study aim to determine the nephroprotective activity of *Pometia pinnata* ethanol extract.

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