CAFFEIC ACID PHENETHYL ESTER PROTECTS AGAINST AMPHOTERICIN B INDUCED NEPHROTOXICITY IN RAT MODEL

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Background: The present study was conducted to investigate whether caffeic acid phenethyl ester (CAPE), an active component of propolis extract, has a protective effect on amphotericin B induced nephrotoxicity in rat models.

Methods: Male Wistar-Albino rats were randomly divided into four groups: (I) control group (*n* = 10); (II) CAPE group (*n* = 9) received 10 µmol/kg CAPE intraperitoneally (i.p.); (III) amphotericin B group (*n* = 7) received one dose of 50 mg/kg amphotericin B; and (IV) amphotericin B plus CAPE group (*n* = 7) received 10 µmol/kg CAPE i.p. and one dose of 50 mg/kg amphotericin B. CAPE started one day before the administration of amphotericin B and continued for 7 days. The left kidney was evaluated histopathologically for nephrotoxicity. Levels of malondialdehyde (MDA), nitric oxide (NO), enzyme activities including catalase (CAT) and superoxide dismutase (SOD) were measured in the right kidney.

Results: Histopatological damage was prominent in the amphotericin B group compared to controls, and the severity of damage was lowered by CAPE administration (Figure 1). The activity of SOD, MDA, and NO levels increased and catalase activity decreased in the amphotericin B group compared to the control group (P=0.0001, P=0.003, P=0.0001, P=0.0001 respectively). Amphotericin B plus CAPE treatment caused a significant decrease in MDA, NO levels, and SOD activity (P=0.04, P=0.002, P=0.0001 respectively) and caused an increase in CAT activity compared with amphotericin B treatment alone (P=0.005).

Conclusion: Amphotericin B toxicity remains high despite developments in drug formulations. The main strategies are based on prevention. The role of oxidative stress in Amphotericin B toxicity is clear. Therefore, administration of CAPE seems to be an alternative agent for the management of Amphotericin B toxicity. Further clinical studies are necessary for confirmation of these positive effects in clinical settings.

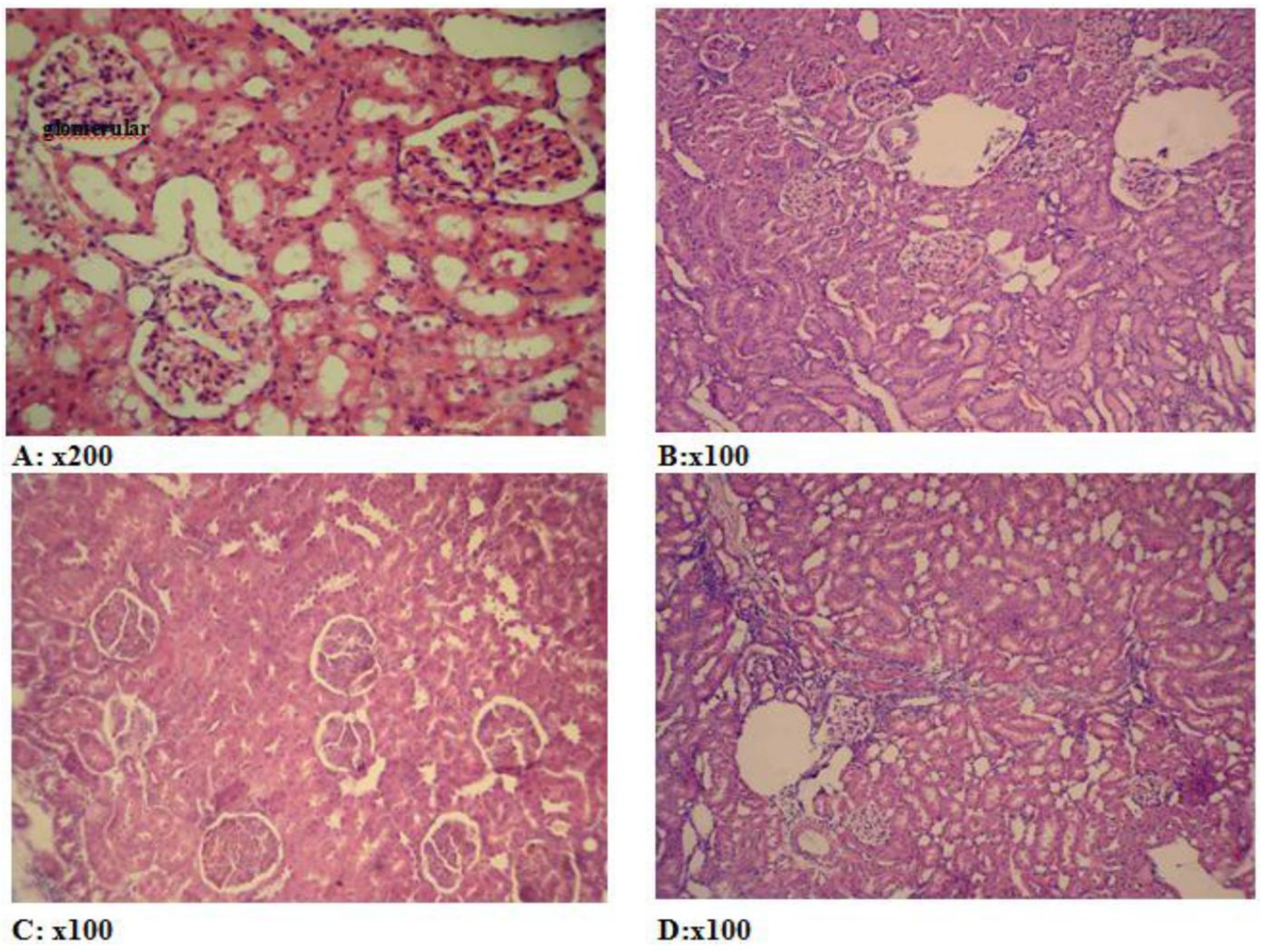

Figure 1. Four micrographs taken from the cortex of kidney in control (A), CAPE (B), Amphotericin B (C) and Amphotericin B + CAPE (D) groups. Control rats show no abnormality (A) and CAPE group had similar findings with the control group (B). Necrotic areas located in the cortex, dilatation-degeneration of the proximal and distal tubules, proximal and distal epithelial cells which are abundant hyperchromatic nuclei are clearly observed in the rat kidneys given amphotericin B (C). Although CAPE treatment reduced the severity of renal damage it was not able to protect completly the histopathological damages (D).

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