Summary

This study was conducted to identify protective effect of grape seed oil and rutin on cefazolin sodium-induced nephrototoxicity. To accomplish this, cefazolin sodium was used to induce oxidative stress on kidney cells which were then treated with grape seed oil and rutin to determine if any of these medicines exerted a protective effect.

Phytochemical analysis of grape seed oil releaved the presence of high amount of fatty acids such as Palmitic (16:0) acid, Oleic (18:1) acid, stearic (18:0), linoleic (18:2) acids which prevent nephrotoxicity, also the present study find a high amount of phenolic compound as Gallic Acid which act as antioxidant agent.

The animals divided in to four groups:

1-The first normal control group which have normal feeding and put under normal condition which consider as a setting group for the other groups.

2-The second group was injected intraperitonially (i.p) in one daily dose for 30 day by cefazolin sodium (4.2 g/kg b.wt).

3-The third group was injected intraperitonially (i.p) in one daily dose for 30 day by cefazolin sodium (4.2 g/kg b.wt) and also taken rutin orally (50 mg/kg b.wt) in one daily dose to CFZ-treated rats for 30 day.

4-The forth group was injected intraperitonially (i.p) in one daily dose for 30 days cefazolin sodium (4.2 g/kg b.wt) and taken grape seed oil orally (100 mg/kg b.wt) in one daily dose to CFZ-treated rats for 30 day.
5-The fifth group was injected orally in one daily dose for 30 days rutin (50 mg/kg b.wt) in one daily dose normal rats for 30 day.

6-The sixth group was injected orally in one daily dose for 30 days grape seed oil (100 mg/kg b.wt) in one daily dose to CFZ-treated rats for 30 day.

The obtained data were subjected for statistical analysis and revealed the following:

1-The level of urea, creatinine and uric acid are increasing in the cefazolin group but on other hand there are improvements in cefazolin-grape seed oil and cefazolin-rutin groups.

2-The levels of Albumin, ALT, and AST are decreasing in the cefazolin group but on other hand there are improvements in cefazolin-grape seed oil and cefazolin-rutin groups.

3-The levels of total bilirubin and cholesterol levels are increasing in the cefazolin group but on other hand there are improvement in gentamicin-fi.sh oil and gentamicin-purstane groups.

4-The levels of ALP are increasing in the cefazolin group but on other hand there are improvements in gentamicin-fi.sh oil and gentamicin-purstane groups.

5-The activity of hepatic MDA and nitric oxide is increasing in the cefazolin group but there are improvements in cefazolin-grape seed oil and cefazolin-rutin groups

6-The activity of kidney MDA and nitric oxide is increasing in the cdefazolin group hut there are improvement in cefazolin-grape seed oil and cefazolin-rutin groups.
7-the activities of hepatic catalase and glutathione-s-transferase are decreasing in the cefazolin group but there are improvements in cefazolin-grape seed oil and cefazolin-rutin groups.

8-The activities of kidney catalase and glutathione-s-transferase show decreasing in the cefazolin group but there are improvement in cefazolin-grape seed oil and cefazolin-rutin groups.

9-Disorders occurred in the electrolyte levels (Na, K, Cl, and Ca) are decreasing in the cefazolin group but on other hand there are improvements in cefazolin-grape seed oil and cefazolin-rutin groups.

**Conclusion**

We conclude that while CFZ elicited deleterious nephrotoxic effects by causing severe damage to renal mitochondria, BBM and other organelles and by suppressing antioxidant defense mechanism, dietary supplementation with grape seed oil enriched in fatty acids and polyphenols caused improvement in nutrition/energy metabolism, BBM integrity, $^{32}$Pi transport capacity and antioxidant defenses and thus prevented CFZ-induced various deleterious effects. We propose that dietary grape seed oil or rutin supplementation may provide a cushion for a prolonged therapeutic option against CFZ nephropathy without harmful side effects.