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**OliveNet™ Journal Club**  
Expert review of literature related to olives and olive oil  
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**Title**  
Protective effects of oleuropein against renal injury oxidative damage in alloxan-induced diabetic rats; a histological and biochemical study  

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**Keywords**  
Oleuropein, antioxidant, alloxan-induced diabetic rat, renal injury, glomerulosclerosis  

**Summary**  
This study represents a conventional in vivo model of drug-induced diabetes to evaluate the effects of oleuropein on the protection of renal injury. Subcutaneous injection of the toxic glucose analogue, alloxan monohydrate (120 mg/kg) in rats was used as a well-established and characterized model of diabetes (2, 3); alloxan is selectively cytotoxic to pancreatic β-cells in rodents resulting in experimental insulin-dependent diabetes mellitus analogous to type 1 diabetes in humans (4). It is a well-established and characterised model which is known to induce inflammation and to generate intracellular thiols and cytotoxic reactive oxygen species in various animal models but not humans; due, at least in part, to lower GLUT2-mediated uptake of alloxan in humans (5). Given that oleuropein is a natural antioxidant with potent anti-inflammatory effects (6), it was hypothesised that it could have protective effects in alloxan-induced diabetic rats.  

**Key points and implications**  
A standard, three group (group 1 = control, group 2 = diabetic and group 3 = diabetic treated with oleuropein) and appropriately powered (n=10) study was performed. Following induction of diabetes, rats in group 3 were treated with oleuropein for 48 days (15 mg/kg, intraperitoneally daily). Blood samples and kidneys were then collected for histological and biochemical analyses. The findings were very convincing indicating that 1) the model worked well with an increase in serum nitric oxide and significant increases in glomerular volume, glomerulosclerosis, and leukocyte infiltration observed in in the diabetic rats compared to controls and, 2) daily treatment with oleuropein resulted in a significant reduction in these parameters, with values analogous to those observed in control mice. Similarly, the findings indicated that 1) in the diabetic group significant increases in serum, liver and renal myeloperoxidase, serum fasting blood glucose, urea and creatinine were observed and, 2) all of these parameters except for serum creatinine were significantly
reduced by oleuropein. Overall, this is a conventional study that extends the accumulated evidence that olive phenolics, such as the abundant oleuropein, display potent antioxidant and anti-inflammatory effects in models of human disease.

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