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Protective effect of Sulforaphane in experimental kidney transplantation model

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Ischemia / reperfusion (I/R) injury is one of the very important factors which affect the transplanted organ and is believed to contribute to overall graft function and survival. Therefore, substances for donor and recipient pretreatment are being needed in order to overcome devastating effects of I/R injury.

The isothiocyanate sulforaphane (SFN) derived from broccoli is a known antioxidative, anti-inflammatory and chemopreventive agent. There is a lack of data regarding the effects of SFN on I/R after kidney transplantation. However, antioxidative and anti-inflammatory properties of SFN are appealing. Thus, this study was designed to investigate protective effects of SFN against I/R injury in clinically relevant experimental kidney transplantation (KTx) model.

In this study, positive effects of sulforaphane on kidney graft function were found. Pretreated animals showed a better survival; moreover, kidney function was improved in treated animals, represented by better serum creatinine and BUN levels. These findings were backed-up by preservation of kidney tubules and mitochondrial microstructure. A higher SOD 2 expression and SOD activity in SFN treated animals was observed, this way presenting antioxidative properties of SFN. Higher apoptotic activity was also found in SFN group.

In conclusion, sulforaphane can protect kidney grafts from ischemia/reperfusion injury through its anti-oxidative effects, preserving mitochondrial microstructure and prolonging graft survival. This work may give knowledge to initiate further clinical research of SFN in the field of kidney transplantation.