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PRELIMINARY TRIAL FOR
THE DEVELOPMENT OF AN EXPERIMENTAL MODEL
OF PUROMYCIN AMINONUCLEOSIDE-INDUCED RENAL DAMAGE IN CATS

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To developmental model of renal damage in cats, uninephrectomized cats were injected with a combination of puromycin aminonucleoside (PAN), which is especially nephrotoxic in rats, and protamine sulfate (PS). In this study, 6 clinically healthy domestic cats (divided into groups A, B and C) and 2 additional cats with renal diseases (group D) were used. Groups A, B and D received daily injections of subcutaneous PAN (2 mg/kg) and intravenous PS (2 separate doses of 5.25 mg/kg) for three days. The series of injections was repeated another three times at 11-day intervals (groups A and D) and 4-day intervals (group B). The same injection protocol after the first 4 series of injections was repeated in one cat in group B. Group C received saline and was considered as a control. The effects of the administration of PAN and PS were investigated hematologically, serum biochemically and histopathologically. In addition, the changes in the urinary protein-creatinine ratio (UP/UC), the activities of urinary enzymes (ULDH, UALP, UGGT and UNAG) and ULDH isoenzymes (ULDH-iso) were monitored.

Group A showed no significant abnormalities. Group B showed mild elevation of BUN and creatinine (CRE) levels. UP/UC and UNAG activities were also elevated following the administration. Hyalin casts were detected in the distal renal tubules histopathologically. Furthermore, the cat that received repeated PAN injection showed more severe elevation of BUN and CRE levels and proteinuria. In this cat, mild lesions of the glomerular loops were detected histopathologically. In group D, elevations of BUN, CRE and UP/UC levels were also recognized. On ULDH-iso analysis, ULDH4 and ULDH5 were elevated in all PAN-treated cats.

These results suggested that the administration of PAN and PS might induce renal damage in cats. In addition, it appeared that the changes in UNAG and UP/UC reflected the progression of renal damage.