SP246

ADMINISTRATION OF ASTRAGALUS MEMBRANACEUS PREVENTED KIDNEY DYSFUNCTION IN MICE AND IN PATIENTS WITH CHRONIC KIDNEY DISEASE

Kagemasa Kajiwara1, Makoto Arai2, Yoshinobu Nakada3, Takaaki Kinoue1

1Department of Community Health, Tokai University School of Medicine, Isehara, Kanagawa, Japan, 2Department of Kampo Medicine, Tokai University School of Medicine, Isehara, Kanagawa, Japan and 3Molecular Life Sciences, Tokai University School of Medicine, Isehara, Kanagawa, Japan

INTRODUCTION AND AIMS: Astragalus membranaceus (AM) is widely used for herbal medicine in Asia (see http://nccih.nih.gov/health/astragalus), and has been shown to possess various pharmacological effects in several organs including the kidney. However, few findings about the therapeutic effect against chronic kidney disease (CKD) have been demonstrated because of the difficulty in the management of experimental severe acute kidney injury (AKI) related to CKD progression. We focused on moderate AKI only causing azotemia to examine the AM effects in mice. Furthermore, we showed a translational approach for therapies with AM to prevent the progression from AKI to CKD.

METHODS: Female C57BL/6 mice were allocated to two groups and administered with AM powder-mixed sterilized 0.5% methylcellulose 400 (AM-administered group) or with sterilized 0.5% methylcellulose 400 (control group), respectively. In advance, about 0.2 ml of blood sample from each mouse was collected by more than two hours before surgery. Anesthetized mice from both groups were surgically operated at 37.0°C with a heating pad. Left renal artery was exposed and occluded by non-traumatic small clips for 30 minutes. Twenty hours after the unilateral renal IR, about 0.2 ml of blood sample was collected from each mouse. These serum samples were measured to detect urea nitrogen (BUN) and creatinine. Next, we obtained a primitive and observational data at Kampo medicine of Tokai University Hospital Isehara to estimate the AM effects against CKD. The Institutional Review Board for Clinical Research of Tokai University approved this study. Informed consent was obtained from the patient.

RESULTS: We carried out unilateral ischemia for 30 minutes in mice of various ages, which showed a slight but significant increase in levels of blood urea nitrogen 20 hours after reperfusion. Interestingly, AM administration normalized this azotemia only in
older mice, suggesting a positive AM effect of age-dependent AKI treatment for CKD therapy. We subsequently examined a clinical case monitoring a moderate CKD patient successively for several years. As expected, declined serum creatine levels and improved estimated glomerular filtration rate were maintained during AM administration for 1 year. This evidence suggests the possibility that AM improves daily generated minor problems such as moderate AKI causing pathogenesis and progression of CKD.

CONCLUSIONS: AM administration can protect kidney against moderate IR injury, which would play a critical role in older kidney and CDK, indicating that AM administration, at least in part, can reduce day-to-day generated AKI, which is ineffective to younger kidney.