Title: Development of innovative method for diagnosing renal disease: Analysis of urinary cells in model mice

Author(s): Kimura, Jumpei; Ichii, Osamu; Otsuka, Saori; Hashimoto, Yoshiharu; Kon, Yasuhiro

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Development of innovative method for diagnosing renal disease -Analysis of urinary cells in model mice-

Jumpei Kimura1), Osamu Ichii1), Saori Otsuka1)2), Yoshiharu Hashimoto1)2), Yasuhiro Ko1)
1) Laboratory of Anatomy, Department of Biomedical Sciences, Graduate School of Veterinary Medicine, Hokkaido University,
2) Office for Faculty Development and Teaching Enriched, Graduate School of Veterinary Medicine, Hokkaido University.

【Conclusion】
1. The urinary decidual cells (UDCs) derived from glomerular epithelial cells and collecting duct cells could be detected and increased with the development of lupus nephritis.
2. Evaluating the UDCs may be useful for diagnosis of lupus nephritis which is progressive to chronic kidney disease (CKD).
3. In future study, we will target other urinary molecules derived from damaged kidney for development of earlier diagnostic methods.

【Introduction】
Recently, the global population of patients with CKD, associated with the change of lifestyle, rapidly increase (Fig.1). Renal disease including CKD is the most serious problem in all animals.

In the present study, we analyzed UDCs to develop new non-invasive early diagnostic methods. Our study will contribute to decrease the number of patients having renal disease.

【Materials and methods】
<animals>
- Renal disease model; BXSB/MpJ
- Lupus nephritis model<CKD model>, n=3
- Control mice; male C57BL/6 (n=3)

【Section.1: Cytological observation of UDCs】
BXSB/MpJ (12-week-old, No.1)  C57BL/6 (12-week-old, No.1)

Magnified image of UDCs from BXSB/MpJ No.1 urine

In BXSB/MpJ mice urine, the several kinds of UDCs were observed.
- UDCs with pyknotic nucleus
  - Small round shaped cells ( ▽ )
  - Round ( ▽ ) or spindle-shaped ( ▽ ) cells with basophilic cytoplasm
- UDCs without nucleus
  - Homogeneous and amorphous cell-component ( ▽ )
  - Other kinds of cells(such as red blood cell, blood platelet etc…)

The UDC numbers of BXSB/MpJ mice were significantly higher than those of C57BL/6 mice. (However, these cells cannot be identified by morphological analysis.)

【Section.2: Urinary mRNA expression】

Moderate glomerular lesion (PAS, Bar = 50μm)

BXSB/MpJ (12-week-old, No.1)

Slight glomerular lesion (PAS, Bar = 50μm)

BXSB/MpJ (12-week-old, No.2)

The expressions of Wt1 and Aqp2 were not detected from the urine samples of BXSB/MpJ No.2 and No.3.

It is suggested that UDCs derived from glomerulus and collecting appeared with the developments of renal pathological lesion in BXSB/MpJ.