

Elemental Analysis and Electron Microscopy of Kidneys Intoxicated with La

T. Daimon,^{*1} Y. Katou,^{*2} Y. Gotoh,^{*2} K. Yamamoto^{*2} and M. Miyagawa^{*3}

^{*1}Department of Anatomy and ^{*2}Central Animal Laboratory, School of Medicine, Teikyo University,
2-11-1, Kaga, Itabasi-ku, Tokyo, 173-8605, Japan

^{*3}Faculty of Health Sciences, Tokyo Metropolitan University of Health Sciences, 7-2-10, Higashi-ogu, Arakawa-ku,
116-8551, Japan

Abstract

Effects of Lanthanum (La) on rats were studied by analytical electron microscopy and PIXE analysis. Rats given five intravenous injections of La (5mg/week) showed depressed weight gains. Electron microscopy of the kidneys showed necrosis of proximal convoluted tubular epithelium cells. The basement membrane of the proximal convoluted epithelium increased in width. Electron opaque deposits were localized in the lamina densa of the thickened basement membrane. Energy dispersive X-ray microanalysis showed La in the electron opaque precipitates deposited in the basement membrane and lysosomes in mesangium cells in the renal corpuscles. PIXE analysis showed La of 40 μ g/g dry weight in the kidneys after administration of La. However, essential elements in the kidney decreased in amount. These morphological and elemental analytical data clearly showed nephrotoxicity in rats after intravenous administrations of La.