

Muscular dystrophic chicken is the hypernatremia

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The muscular dystrophy chicken has been studying as model animal of muscular dystrophy for more than 50 years. Recently, the mutation of WW domain containing E3 ubiquitin protein ligase 1 (WWP1) gene has been identified as a responsible for muscular dystrophy chicken. We observed that muscular dystrophy chicken not only showed the degeneration of skeletal muscles but also produced watery feces. Therefore, we examined the possibility of abnormalities in water metabolism of muscular dystrophy chicken. We first analyzed plasma osmolality and gene expression of aquaporin 2 (AQP2), AQP3 and alpha subunit of the amiloride-sensitive epithelial sodium channel (α ENaC) in muscular dystrophy chicken and White Leghorn chicken under normal physiological conditions at five-week old. Subsequently, we analyzed these same parameters after one-day water-deprivation. The main findings of our study are that: I) the plasma osmolality was significantly higher in muscular dystrophic chicken than in White Leghorn; II) kidney α ENaC mRNA expression was significantly lower in muscular dystrophic chicken than in White Leghorn; III) AQP2 and AQP3 mRNA expressions in muscular dystrophic chicken were similar in White Leghorn. We suggest that the mutation of WWP1 may cause the abnormality of sodium absorption, and thus muscular dystrophic chicken become hypernatremic.