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Nail-patella 증후군의 임상-유전학적 연구

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A Clinico-genetic Study of Nail-patella Syndrome

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Background : Nail-patella syndrome (NPS) is an autosomal dominant disease characterized by classic tetrad of dysplastic nails, absent or hypoplastic patellae, elbow dysplasia, and iliac horns. Some patients manifest nephropathy and adult-onset glaucoma. NPS is associated with mutations in the LMXIB gene. There is marked inter- and intrafamilial variability in the phenotypes.

Methods : In this study, phenotype-genotype correlation was analyzed in 7 unrelated Korean children with NPS.

Results : The probands were 3 boy and 4 girls. They manifested dysplastic nails (7/7, 100%), absent or hypoplastic patellae (6/7, 86%), elbow dysplasia or contracture (4/7, 57%), iliac horns (3/7, 43%), and nephropathy (2/7, 29%). Four missense mutations [2 in the LIM-B domain (H114Q and L127P) and 2 in the homeodomain (R200Q and A213P)] and 1 frame-shifting deletion (c,680delA) were identified in the LMXIB Gene. R200Q and A213P are known to be common mutations, and R200Q was detected in 3 patients in this study. Autosomal dominant inheritance was identified in 3 patients by phenotype and genotype analysis of the family members and in 2 patients by phenotype analysis only. Remaining 1 patient had de novo R200Q mutation. One patient and her mother with R200Q mutation developed nephrotic syndrome, which progressed to end-stage renal disease (ESRD). Another patient with H114Q mutation had asymptomatic proteinuria with microscopic hematuria, and her father had ESRD. Glaucoma was not detected in any patients or family members affected. There were inter- and intrafamilial variability of the phenotypes, but no genotype-phenotype correlation was identified.

Conclusion : This is the first study to characterize mutations in the LMX1B gene in Korean patients with NPS. R200Q is a common mutation in Korean, also. The mechanism underlying the phenotypic variations and predisposing factors to the development nephropathy remain unknown.