

# Analysis of Phenotypes and Genotypes in 84 Patients with 21-Hydroxylase Deficiency

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## Objectives:

Congenital adrenal hyperplasia (CAH) is a group of autosomal recessive disorders characterized by impaired cortisol synthesis. 21-hydroxylase deficiency (21-OHD) caused by mutations in CYP21A2 gene is the most common form of CAH. This study aims to analyze the phenotype-genotype correlation and the characteristics of gene mutation frequency of 21-OHD patients in China, helping to provide evidence for clinical practice and genetic counseling of 21-OHD patients.

## Methods:

The clinical features, laboratory tests and gene mutational analysis of 84 cases of 21-OHD in department of Pediatrics of Sun Yat-sen Memorial Hospital, Sun Yat-Sen University from 2012 to 2018 were analyzed retrospectively. The correlation between phenotypes and genotypes of these patients were analyzed.

## Results:

(1) 59 of 84 patients (70.2%) who were classified as salt-wasting (SW) forms presented adrenal crisis or other signs of salt loss at the age of 7 days to 2 months. The other 21 patients did not present any signs of salt loss. (2) Mutations of CYP21A2 gene on two alleles were found in all 84 patients (168 alleles). The mutation types included different point mutations (145/168, 86.3%), large gene deletions (15/168, 8.9%) and clusters of point mutations (8/168, 4.8%). 20 different point mutation were found in these patients, and the most frequent point mutations in order were I2G, p.I173N, p.R357W and p.Q319\*, accounting for 69.8% of alleles. (3) In 46 of 59 patients of SW forms (78.0%), predicted phenotypes according to genotypes were consistent with their actual salt-wasting phenotypes.

## Conclusions:

Patients of 21-OHD might often present adrenal crisis or other signs of salt loss in 2 month after birth. Point mutations were the most comment types of CYP21A2 gene mutations. In this study, the most frequent point mutations in order were I2G, p.I173N, p.R357W and p.Q319\*, and in 78.0% patients of SW forms, predicted phenotypes according to genotypes were consistent with their actual phenotypes, indicating that estimate of phenotypes according to genotypes had certain clinical significance for 21-OHD patients.

## References:

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