

## Genetic and clinical characteristics of Chinese children with Glucokinase-maturity-onset diabetes of the young (GCK-MODY)

### ABSTRACT

Background: There is scarcity of information on the clinical features and genetics of glucokinase-maturity-onset diabetes of the young (GCK-MODY) in China. The aim of the study was to investigate the clinical and molecular characteristics of Chinese children with GCK-MODY. Methods: Eleven children with asymptomatic hyperglycemia and clinically suspected GCK-MODY were identified from the database of children with diabetes in the biggest children's hospital in South China. Clinical data were obtained from medical records. Blood was collected from the patients and their parents for glucokinase (GCK) gene analysis. Parents without diabetes were tested for fasting glucose and HbA1c. Clinical information and blood for GCK gene analysis were obtained from grandparents with diabetes. GCK gene mutational analysis was performed by polymerase chain reaction and direct sequencing. Patients without a GCK gene mutation were screened by targeted next-generation sequencing (NGS) technology for other MODY genes. Results: Nine children tested positive for GCK gene mutations while two were negative. The nine GCK-MODY patients were from unrelated families, aged 1 month to 9 years and 1 month at first detection of hyperglycaemia. Fasting glucose was elevated (6.1–8.5 mmol/L), HbA1c 5.2–6.7% (33.3–49.7 mmol/mol), both remained stable on follow-up over 9 months to 5 years. Five detected mutations had been previously reported: p.Val182Met, c.679 + 1G > A, p.Gly295Ser, p.Arg191Gln and p.Met41Thr. Four mutations were novel: c.483 + 2 T > A, p.Ser151del, p.Met57GlyfsX29 and p.Val374\_Ala377del. No mutations were identified in the other two patients, who were also tested by NGS. Conclusions: GCK gene mutations are detected in Chinese children and their family members with typical clinical features of GCK-MODY. Four novel mutations are detected.

**Keyword:** MODY; Glucokinase; Genetics; Chinese; Children

