De novo mutation of *ABCC8* gene in a child with MODY developed at 25 months of age

Goo Lyeon Kim[1], Soo Heon Kwak[2], Jeesuk Yu[1]

[1]Department of Pediatrics, Dankook University Hospital, Dankook University College of Medicine, Cheonan, Korea
[2]Department of Internal Medicine, Seoul National University College of Medicine, Seoul, Korea

Introduction

The incidence of type 2 diabetes mellitus increased in children and adolescents. The underlying mechanism of childhood-onset type 2 diabetes mellitus may be different to the adult-onset type 2 diabetes. Therefore, it is useful to conduct genetic study in children with type 2 feature to understand underlying cause of glycemic dysregulation as well as for the management of diabetes mellitus.

Case

A 25-month-old male was admitted at Urology department for the operation of scrotal mass and was referred to the department of Pediatrics because hyperglycemia was detected during pre-op evaluation. Polydipsia and polyuria were reported from the parents. The child had no family history of diabetes mellitus (DM). He was born at 36 weeks of gestation by normal vaginal delivery with birth weight of 2.61kg.

Initial HbA1c level was 13.6%. Serum levels of glucose, insulin, and C-peptide were 413 mg/dL, 2.0 uIU/mL, and 0.45 ng/mL, respectively. Under the impression of type 1 DM, subcutaneous insulin injection was started with NPH and regular insulin with total insulin dose of 0.5 U/kg/day. We increased insulin dose up to 0.75 U/kg/day at discharge. After discharge, autoantibodies were reported as negative. Glutamic acid decarboxylase antibody was less than 0.2 U/mL (Normal range: 0-1 U/mL) and anti-insulin antibody was 5% (Normal range: 0-7%). He was hospitalized once again with uncontrolled blood glucose level, and daily insulin dosage was increased up to 1 U/kg/day. During follow-up at out-patient clinic, his HbA1c was maintained well, ranging from 6.3 to 6.9%. We could gradually reduce insulin dose to 0.58 U/kg/day, but intermittent mild hypoglycemia occurred. Under the suspicion of type 2 DM, we changed treatment modality from NPH and RI to Lantus and Sulfonylurea (Glimepiride™). Furthermore, we could discontinue Lantus™ and added Metformin™ (Fig. 1). There was no severe hypoglycemia or hyperglycemia. With a strong suspicion of MODY, we performed targeted exome sequencing which included 29 genes associated with monogenic DM. Mutation of the gene *ABCC8* (p.Asp209Glu) was found (Fig. 2A). Both parents did not have any mutation in the region of *ABCC8* gene.

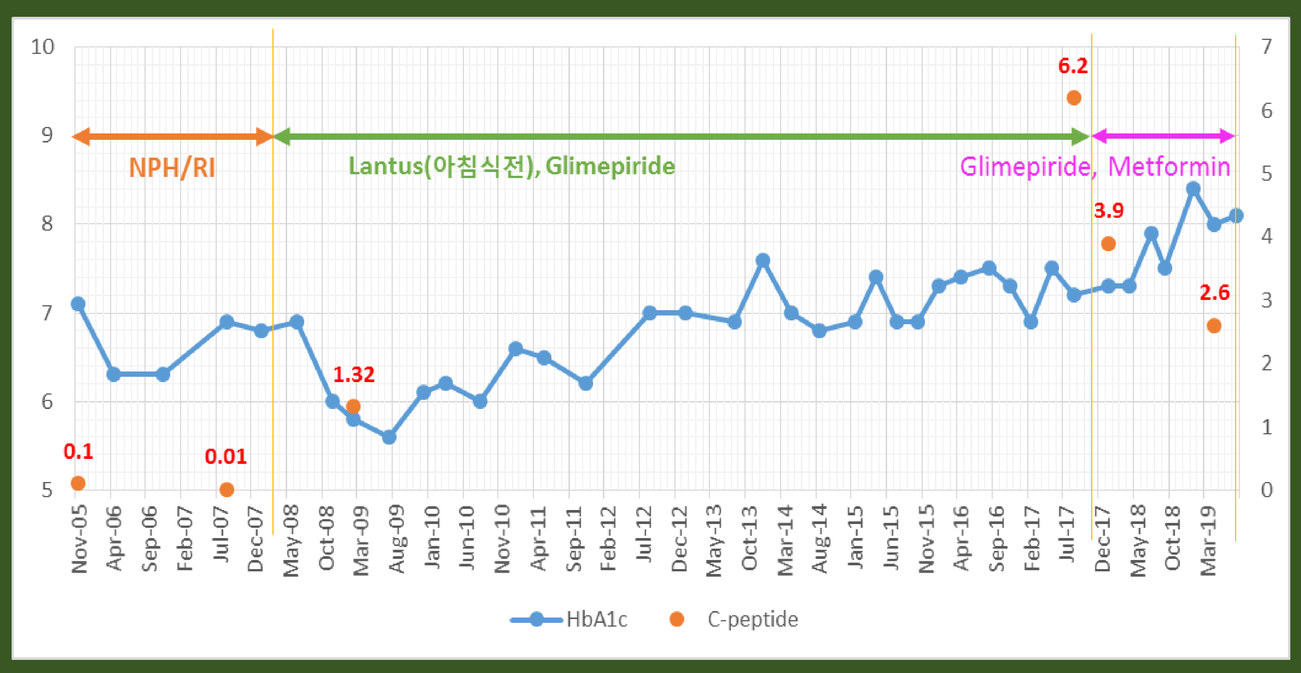

Fig.1. HbA1c and C-peptide levels and management during follow-up.

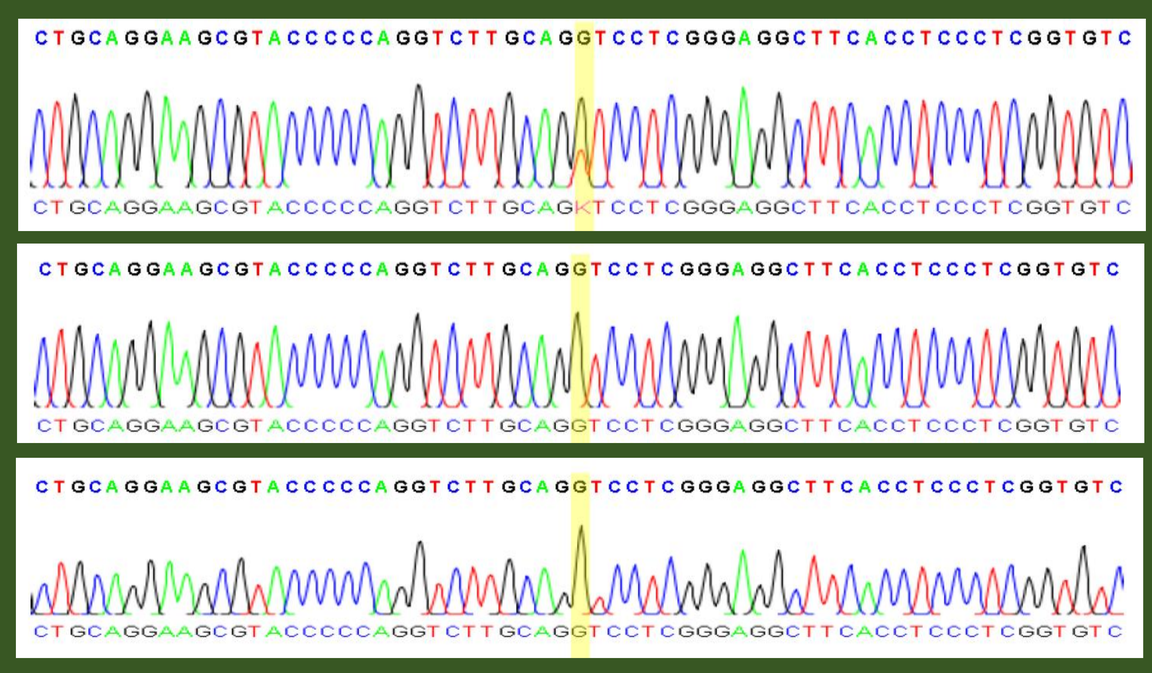

Fig.2. Chromatogram of the gene *ABCC8* in the family. Case (A), Father (B), and Mother (C).

Conclusion

It may be recommended to perform the genetic test to find the candidate gene of type 2 DM which developed in children and adolescents. Here we report a case with de novo mutation of *ABCC8* gene in a child with MODY developed at 25 months of age.

References

1. Elizabeth R, Alan M. Obesity and Type 2 Diabetes in Children: Epidemiology and Treatment. Curr Diab Rep 2014;14:508.
2. Annabelle S. Monogenic diabetes in children and young adults: Challenges for researcher, clinician and patient. Rev Endocr Metab Disord 2006;7:171-185.

58ESPE P3-064
Diabetes and insulin
Jeesuk Yu
Poster presented at: ESPE 2019 VIENNA
PosterSessionOnline.com