Deletion at 12q12 increases the risk of developmental delay and intellectual disability

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Introduction
Deletions at 12q12 are extremely rare chromosomal imbalances; only four cases involving a deletion of this type have previously been reported. Here, we identified a Chinese girl with a 3.18 Mb deletion at 12q12 (human genome build 19: 43,418,911-46,601,627), who showed postnatal growth delay, low-set ears, small hands and feet, widely spaced nipples and blue sclerae. In these five sporadic cases, all of the patients exhibited developmental issues accompanied by different degrees of intellectual disability.

Method
This study was approved by ethics committees of our hospital and consent was obtained from the patient’s parents. Chromosomal microarray analyses (CMAs) was performed on a CytoScan 750K Array (Affymetrix, CA) in accordance with the manufacturer’s instructions. Genomic DNA was extracted from peripheral blood and isolated via standard procedures using a QIAamp DNA Blood Mini Kit (Qiagen, Hilden). Polymerase chain reaction (PCR) was performed on a 9700 thermal cycler (AB, Singapore).

Results & Conclusions
We presented 11 individuals with 12q12 deletion, including one new subject. Our analysis suggested that a 12q12 microdeletion increases risk for developmental delay and intellectual disability. In conclusion, 12q12 deletion could be added to the database of pathophysiological genomic alterations that induce developmental delay, which will be helpful for counselling and management of the patients with developmental delay.

References

Figure 1. Appearance of the patient at the age of 3 months. a: Facial features including; upslanting palpebral fissures, a broad nasal bridge with anteverted nares, and the blue sclerae; b: Laterral view showing short neck, low-set and large ears; c: Small hands and 5th finger clinodactyly; d: Intersecting palms; e: Widely spaced nipples; f: Small feet.

Figure 2. Genes with high HI scores in the deleted 12q12 regions (modified from the DECIPHER genome browser: https://decipher.sanger.ac.uk) in our patient and 10 other patients. Case 1 is the girl we have reported; case 2 was reported by Carlsen in 2015; case 3 was reported by Failla in 2008; and cases 4 and 5 involved patients 1 and 2 (firstly reported by Tonoki et al., 1998), respectively, of the patients reviewed by Miyake in 2004. Cases 5-11 were obtained from the DECIPHER database.