Clinical characteristics of a child with Mendelian susceptibility to mycobacterial disease due to mutations of IL12RB1
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Background and aims Autosomal recessive interleukin-12 receptor β1 (IL-12Rβ1) deficiency is the most common cause of Mendelian susceptibility to mycobacterial disease (MSMD). Here we report a case with multi-drug resistant tuberculosis (MDR-TB) due to mutations of IL12RB1 to investigate the clinical characteristics of MSMD.

Methods The clinical features of a child with mutations of IL12RB1 were summarized and the mutations were analyzed by Sanger sequencing.

Results The 10-year-old boy was vaccinated with Bacille Calmette-Guérin (BCG) at birth, and suffered BCG disease within 3 months of age. A progressive left side axillary adenopathy was developed, then infections disseminated to the lung, thoracic cavity, peritoneal cavity, intestine, brain, skin, and ear. The patient was diagnosed with MSMD due to IL12RB1 deficiency at five years old. There were no significant abnormalities in routine immunological examinations including lymphocyte subsets, immunoglobulins, complement and neutrophil respiratory burst test. The child didn’t receive early and standard anti-tuberculosis therapies after onset, and the disease progressed to MDR-TB. During the whole disease course, the anti-tuberculosis treatments were adjusted several times owing to poor responses. rIFN-γ was added twice a week but stopped because of the adverse reaction of fever. The infections were uncontrolled. Genetic testing revealed the compound heterozygous IL12RB1 mutations c.632G>C in exon 7 and c.1106T>C in exon 10 inherited from father and mother respectively. Those variations lead to R211P and I369T amino acid changes reported previously.

Conclusions Mutations of IL12RB1 can lead to severe MSMD. When there were no obvious abnormalities in routine immunization assessments of patients with BCG disease, the possibility of MSMD needs to be considered. IL12RB1 protein detection and gene analysis are helpful for diagnosis. Standard anti-tuberculosis treatments are conducive to tuberculosis or BCG infection control. The efficacy should be evaluated to determine whether to stop it when adverse reactions of rIFN-γ happen.