USERN™
| Universal Scientific Education & Research Network |
| usern.org |

Twins with Novel X-linked variant in *IL2RG* Gene Suspected to Early Onset Inflammatory Bowel Disease

Elham Rayzan [1], Sepideh Shahkarami [2], Samaneh Zoghi [3], Kaan Boztug [4], Nima Rezaei [2,5]

1- Research Center for Immunodeficiencies, Pediatrics Center of Excellence, Children's Medical Center, Tehran University of Medical Science, Tehran, Iran.
2- International Hematology/Oncology of Pediatrics' Experts (IHOPE), Universal Scientific Education and Research Network (USERN), Tehran, Iran.
3- Ludwig Boltzmann Institute for Rare and Undiagnosed Diseases, Vienna, Austria.
4- Department of Pediatric Hematology and Oncology, St. Anna Children's Hospital, Department of Pediatrics, Medical University of Vienna, Vienna, Austria.
5- Department of Immunology, School of Medicine, Tehran University of Medical Sciences, Tehran, Iran.

Objective

X-linked severe combined immunodeficiency is caused by the *IL2RG* gene which encodes a protein called the common gamma chain. Herein, a case of novel X-linked variant in *IL2RG* gene in twin brothers with inflammatory bowel symptoms has been reported.

Case Presentation

Two-year-old twin brothers born to non-consanguineous parents were referred to Children's Medical Center following chronic non-bloody diarrhea which was started at the age of 12 months. Also, their first hospital admission was at the age of 2 months following pneumonia. Pancolitis revealed after performing upper and lower endoscopy for one of the brothers with more severe gastrointestinal symptoms. Furthermore, polymerase chain reaction confirmed cytomegalovirus colitis and the patient underwent intravenous Gancyclovir. Further investigations confirmed positive Epstein–Barr virus serology as well. However, the other brother's tests were negative for the mentioned viral infections, both had experienced recurrent respiratory symptoms and two episodes of otitis media. They had failure to thrive and several admissions due to severe watery diarrhea. Moreover, complementary investigations demonstrated *G6PD* deficiency in the twins, that was in accordance with episodes of jaundice and hemolytic anemia. Their older 7-year-old brother and both parents were apparently healthy.

Results

Immunologic laboratory tests showed very low levels of CD4+ cells in both patients. Next generation Sequencing-based gene panel tests proved a novel missense X-linked *IL2RG* gene variant (70330011 A>G) in one of the patients, which soon after was confirmed by Sanger segregation in his twin brother. Both parents were wild type and never had experienced similar symptoms.

Conclusions

In this report, twins with a novel *IL2RG* gene variant has been described. Based on genetic analysis both parents were wild type and symptom-free. While the bowel inflammatory symptoms were the very early disease manifestations, X-linked severe combined immunodeficiency was established as the final diagnosis. In conclusion, various severe combined immunodeficiency manifestations could be a result of different mutation sites, even in the same gene defect.