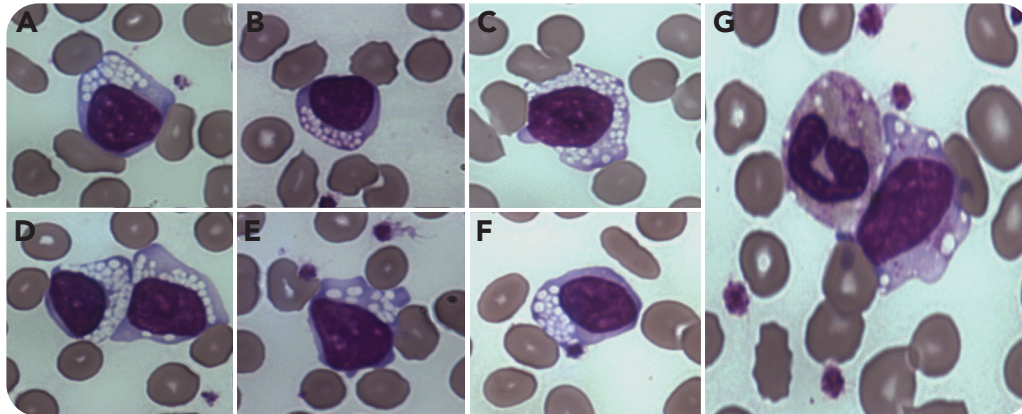


## Vacuolated lymphocytes, a leading piece of diagnostic evidence for a rare storage disorder

Elham Jamali, Peyvand Pathobiology and Genetic Lab Complex; and Reza Ranjbaran, Shiraz University of Medical Sciences



A 7-year-old girl presented with coarse facial features, cardiomegaly, intellectual disability, seizures, and macular cherry red spot. A mucopolysaccharidosis (MPS) disorder was suspected. Hepatosplenomegaly was absent. A comprehensive metabolic panel revealed normal kidney, liver, and thyroid function (thyrotropin: 1.75  $\mu$ U/mL; T4: 9.5  $\mu$ g/dL; blood urea nitrogen: 17 mg/dL; creatinine: 0.38 mg/dL), and the level of glycosaminoglycans in urine was normal (urine MPS: 4.2 mg/mmol creatinine), which excludes most of the common MPS disorders. Hematologic parameters showed hemoglobin: 11.8 g/dL; white blood cells:  $4.48 \times 10^9$ /L; platelets:  $234 \times 10^9$ /L. There was mild neutropenia (absolute neutrophil count:  $1.75 \times 10^9$ /L). However, the blood film showed prominent cytoplasmic vacuoles in peripheral blood

lymphocytes (panels A-F; 100 $\times$  objective, total magnification  $\times 1000$ ; Wright's stain) suggestive of a storage disorder. Whole exome sequencing revealed a diagnosis of galactosialidosis due to homozygous mutations in the CTSA gene (c.556C>A: p. P186T).

Lysosomal storage disorders (LSDs) are a group of rare inherited diseases, and patients frequently encounter delay in diagnosis. Cytoplasmic vacuoles in neutrophils and monocytes are seen in a variety of conditions due to the phagocytic function of these cells (panel G; 100 $\times$  objective, total magnification  $\times 1000$ ; Wright's stain). Vacuoles in mature lymphocytes should raise suspicion of an LSD.