Article (7)

SP1-binding site polymorphism in the COLIA1 gene and its relation to osteoporosis in Egyptian patients with Gaucher disease

Abstract:

Gaucher disease (GD) is a recessive disorder due to mutation of the glucocerebrosidase gene (GBA) leading to decrease of β-glucocerebrosidase (GCase) activity, accumulation of glucosylceramide and abnormal levels of other sphingolipids. Enzyme replacement is most common therapy; however, bone manifestations can be slow to respond. This study tested the distribution of the polymorphic variant in the regulatory region of COLIA1 gene at recognition site for transcription factor SP1 and its relation to bone mineral density in Egyptian patients with Gaucher Disease compared to control group. Thirty Egyptian patients with GD from Abou El Riche Hospital, Cairo University & 30 healthy age and sexmatched individuals from Fayoum University Hospitals were included as controls.

Clinical examination and DXA scan were done for both patients and controls. SP1 binding site polymorphic variant at COLIA1 gene was detected by PCR-RFLP for both groups. Forty three percent (43%) of GD patients had low lumbar BMD (osteopenia) and 36.7% showed very low BMD (osteoporosis). Over sixty six percent (66.6%) of the GD patients had the wild genotype (G/G) while 26.7% were heterozygous for G/T polymorphism. Only 6.7% harbored the homozygous T/T variant. There was a high statistical significant difference between various COLIA1 genotypes as regards Z-score, which indicates association between COLIA1 genotypes, and lumbar spine Z-score. The findings make the hypothesis of an association between Sp1 COLIA1 gene polymorphism and bone disease in GD probably feasible and that component strongly influence bone remodeling.

Key words: COLIA1 gene, Gaucher disease (GD), bone mineral density (BMD), osteoporosis, osteopenia.