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ATP6V1B1 mutations cause recessive distal renal tubular acidosis in Algerian patients with hearing loss

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Abstract

Hereditary distal renal tubular acidosis (dRTA) is characterized by metabolic acidosis due to impaired renal acid excretion. To date, three genes (*ATP6V1B1*, *ATP6V0A4* and *SLC4A1*) have been reported to be responsible for this genetic disorder. Notably, mutations of *ATP6V1B1* gene, which encode B1-subunit of H+-ATPase pump cause distal renal tubular acidosis often, associated with sensorineural hearing loss (SNHL). Furthermore, enlarged vestibular aqueduct (EVA) was also described in some patients with *ATP6V1B1* mutations. Four Algerian unrelated patients presented with dRTA and SNHL were recruited. The *ATP6V1B1* gene was preferentially analyzed in all these patients by Sanger sequencing.

We identified two previously reported variants in *ATP6V1B1* gene: a frameshift mutation (c.1155dupC: p.(Ile386Hisfs*56) in exon 12 and a splicing mutation in intron 2 (c.175-1G>C: p?). Both mutations were homozygous in affected members. Interestingly, one patient with p.(Ile386Hisfs*56) mutation presented profound SNHL and bilateral enlarged vestibular aqueduct (EVA). Our study indicates the importance contribution of *ATP6V1B1* gene mutations to the pathogenesis of the dRTA in the Algerian population and will contribute to introducing principles to predict the characteristics of the dRTA in patients. Thus, screening for this gene could allow rapid patient management and provide adequate genetic counseling.

Keywords: *ATP6V1B1* mutations, Distal renal tubular acidosis, Hearing loss.