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Case Report

HYPOPARATHYROIDISM, DEAFNESS, AND RENAL FAILURE: A CASE OF BARAKAT SYNDROME

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Abstract

Introduction: Barakat syndrome is an autosomal dominant rare genetic disease caused by haploinsufficiency of the GATA binding protein 3 (*GATA3*) gene[1]. It is also known as HDR syndrome, and is characterized by varying degrees of hypoparathyroidism, sensorineural deafness and renal disease.

Case report: We report a rare case of Barakat Syndrome (HDR Syndrome) a developmental disorder associated with mutations in the *GATA3* gene.

Conclusion: It emphasises the need for HDR syndrome to be considered in the differential diagnosis of persistent hypocalcaemia with sensorineural deafness and/or renal involvement, and for appropriate genetic evaluation to be done to confirm the diagnosis.

Keywords: Hypoparathyroidism, Sensorineural deafness, renal dysfunction, GATA3 gene.

Introduction

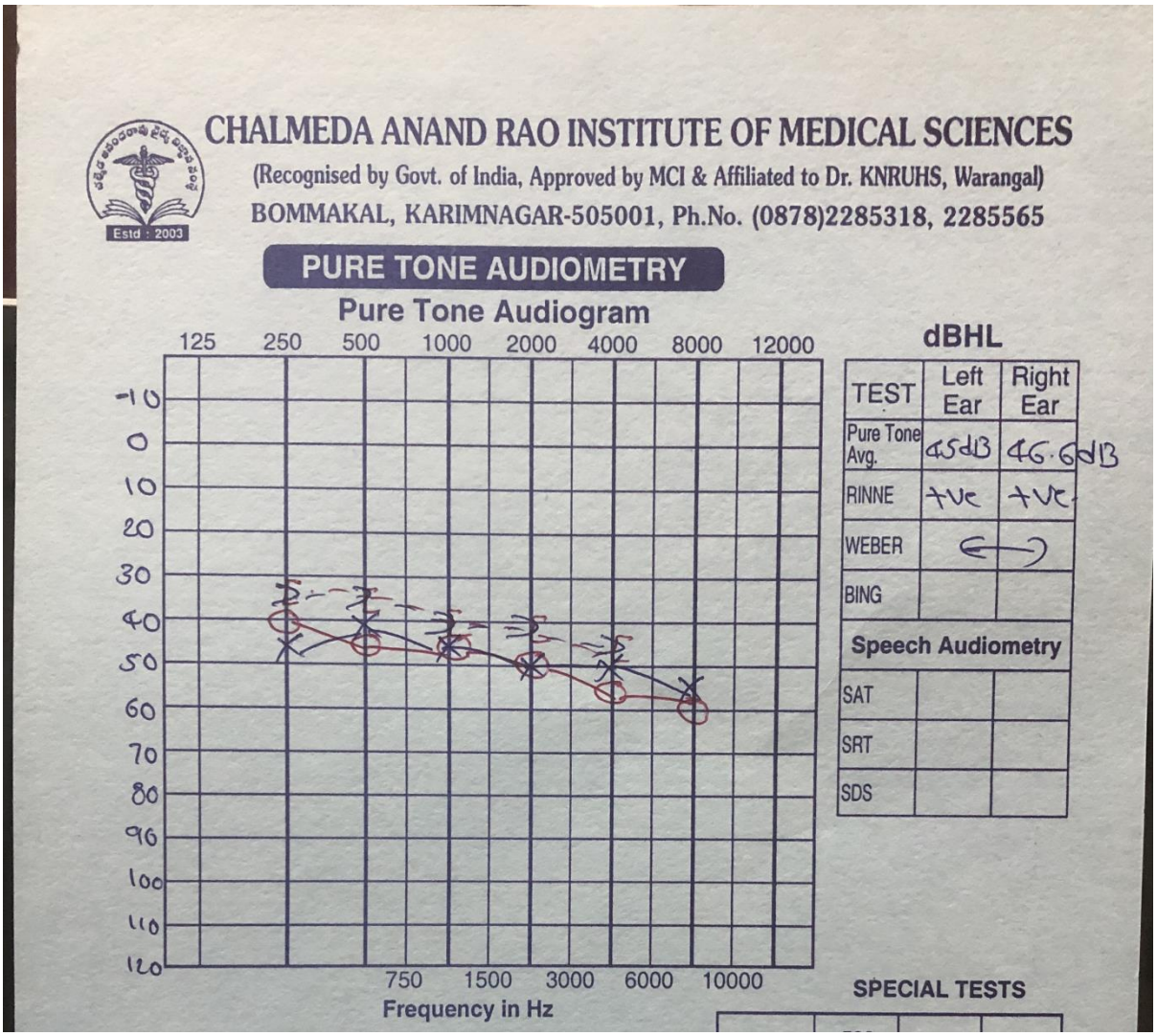
The HDR syndrome, also known as Barakat syndrome is as an autosomal dominant rare genetic disorder, primarily caused by haploinsufficiency of *GATA3* gene on chromosome 10p14. *GATA3* is expressed in the developing parathyroid glands, inner ears and kidneys, together with the thymus and central nervous system. Genetic variations that can cause HDR syndrome include missense or nonsense pathogenic variants, small insertions or deletions and large deletions, which cause structural variations in the *GATA3* gene. However, it is reported that identifiable *GATA3* variants are not present in all patients with clinical features compatible with the HDR syndrome [1].

Case Report

A young male aged 30 years was admitted in our hospital. Patient was a known case of hypocalcemia on oral calcium and Vitamin D supplementation since 3 yrs. Patient was brought to the OPD with chief complaints of fever, extreme muscle tenderness, recent onset of deafness, decreased urine output, altered sensorium. His vital signs were within the normal range. Neurological examination showed depression of deep tendon reflexes in both upper and lower extremities. Chvostek's and Trousseau's signs were negative. On investigating, his Calcium levels were 4.1 mg/dl, PTH levels were 1 pg/ml (Reference levels – 60-80pg/ml), with normal magnesium and phosphate levels. Patient also had renal dysfunction with a Serum creatinine of 2.3mg/dl and Blood Urea – 169mg/dl.

Pure tone audiometry (PTA) showed bilateral moderately severe hearing loss that was more severe at the higher end of the frequency spectrum. Ultrasonography of the abdomen and pelvis was unremarkable. Neuroimaging was not done as patient improved after intravenous

injection of calcium. Because of the simultaneous occurrence of hypoparathyroidism, deafness, and renal dysfunction, the patient was diagnosed with HDR syndrome. However, chromosomal analysis was not done.



Discussion

HDR syndrome can occur at any age, and patients with this syndrome usually show symptoms related to hypocalcaemia. Hypoparathyroidism is also a consistent feature in HDR individuals, occurring in well over 90% of patients. Individuals may be asymptomatic despite marked hypocalcaemia or may present with features of symptomatic hypocalcaemia with neuromuscular irritability, tetany, hypocalcaemia cardiomyopathy, and seizures. Greater than 90% of HDR syndrome patients have concurrent hypoparathyroidism and deafness and over 80% have renal tract abnormalities. However, approximately 20% of patients may present with no discernible renal tract involvement, presumably indicating a reduced penetrance and variable expression of renal anomalies in *GATA3* haploinsufficiency [3]. However, even though sensorineural deafness was also commonly reported, the definite time of its onset is not well known, as it is a slowly progressive disorder and early medical attention is not usually sought by most of the patients. At the time of the clinical evaluation, if the patient has profound or demonstrable deafness or there is a family history of deafness, this may provide a clue regarding the underlying HDR syndrome. If mild to moderate deafness is not identified during routine clinical examination and the patient also is unaware

of its presence, the diagnosis often gets delayed. This is a Gray area in this disease. This case emphasizes that in the evaluation of persistent hypocalcaemia with renal and/or sensorineural deafness, HDR syndrome should be considered. Comprehensive renal and audiometry assessments should be done in clinically suspected patients, to establish the diagnosis and to provide specific appropriate care and rehabilitation.

Conclusion

On review of literature, severe hypoparathyroidism, sensorineural deafness and renal disease together encompass a rare genetic syndrome caused by mutations in GATA 3 gene, or by a missing piece of genetic material on chromosome 10 that includes the GATA3 gene called "***BARAKAT SYNDROME***" or ***HDR SYNDROME***.

Conflict of interest:

The authors declared no conflict of interest.

References

1. Joseph AD, Sirisena ND, Kumanan T, Sujanitha V, Strelow V, Yamamoto R, Wieczorek S, Dissanayake VH. Hypoparathyroidism, Sensorineural deafness and renal disease (Barakat syndrome) caused by a reduced gene dosage in GATA3: a case report and review of literature. BMC endocrine disorders. 2019 Dec;19(1):1-8.

2. Sau T, Chatterjee A, Ghosh K, Dey S. Seizure, deafness and renal agenesis: A rare case of Barakat syndrome. Annals of Indian Academy of Neurology. 2013 Jan;16(1):91.

3. Upadhyay J, Steenkamp DW, Milunsky JM. The syndrome of hypoparathyroidism, deafness, and renal anomalies. Endocrine Practice. 2013 Nov 1;19(6):1035-42.