Case Report

Chopra–Amiel–Gordon Syndrome with Severe Renal and Ophthalmologic Involvement

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Abstract

Chopra–Amiel–Gordon syndrome (CAGS) is a rare disorder caused by pathogenic variants of the ANKRD17 gene. This condition is an autosomal dominant neurodevelopmental disorder characterized by developmental delay, speech impairment, epilepsy, behavioral abnormalities, and craniofacial abnormalities. In the present case, a 10-year-old boy with a heterozygous ANKRD17 pathogenic variant presented with classical features of CAGS along with involvement of multiple body systems. Furthermore, progressive renal disease with bilateral renal and ureteric calculi leading to chronic kidney disease, cerebral and cerebellar atrophy on neuroimaging, and severe ophthalmologic abnormalities, including bilateral cataracts, buphthalmos, and phthisis bulbi, were noted. Early genetic diagnosis is important for optimal care, and continued case reporting is crucial to refine genotype–phenotype correlations in this rare disorder.

Keywords: Chopra–Amiel–Gordon syndrome; ANKRD17; neurodevelopmental disorder; chronic kidney disease; renal calculi; ophthalmologic abnormalities; cataract; rare genetic disorder.

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Introduction

Chopra–Amiel–Gordon syndrome (CAGS), also known as ANKRD17-related neurodevelopmental syndrome, is an ultra-rare autosomal-dominant disorder caused by heterozygous pathogenic variants in the ANKRD17 gene on chromosome 4q13. It was initially described in 2021, but the condition has since been more widely recognized following the development of next-generation sequencing and global natural history studies. Current estimates indicate fewer than 50 to 60 cases of the disease worldwide, and it is worth noting that this disease is uncommon and that its phenotypic spectrum is in transition.[13]

ANKRD17 is a gene that codes a protein, ankyrin repeat domain-containing protein 17, which takes part in several cell events such as cell-cycle regulation, neuronal proliferation and differentiation, vascular development, immune regulation, and Hippo/YAP signaling pathways.[1,4] The loss-of-function (LOF) type of haploinsufficiency, which accounts for the majority of loss-of-function mutations (most often nonsense mutations, splice-site mutations, or deletions of several genes), is the most common pathogenic mechanism.[2,3]

CAGS is clinically typified by global developmental delay and/or intellectual disability, disproportionate expressive language impairment, and childhood apraxia of speech. Other frequently noted issues are epilepsy, autism spectrum disorders, behavioral concerns, and especially attention-deficit/hyperactivity disorder, feeding disability, postnatal growth retardation, recurrent infections, gait disorder, and typical craniofacial dysmorphism.[1-5] Characteristics of the face usually include a triangular face, a high anterior hairline, deep-set eyes that are periorbital full, deep-set/almond eyes, thick nasal alae, flared nostrils, full cheeks, and a thin vermilion upper lip.[1,6]

Despite the reported cases of renal anomalies (such as renal agenesis) and ophthalmologic abnormalities (strabismus, refractive error, cataracts), cases of severe renal disease and progressive ophthalmologic pathology are rare in the published literature.[2,7] Recent cohort-based observations leading to case reports have started to broaden the phenotype of obesity, disastrous cerebral hemorrhage in infancy, immune regulation, and vascular defects.[3,8]

Case Presentation

The patient was a 10-year-old boy whose birth was a result of a consanguineous marriage and had deranged kidney functioning and a poorly functioning left kidney. The Patient reported burning micturition, persistent dribbling of urine, and GH.

There were slow developmental milestones in all areas. Anthropometric measurements showed undernourishment, with weight below the 3rd centile, height between the 25th and 50th centiles, and head circumference at the 3rd centile according to the WHO growth charts.

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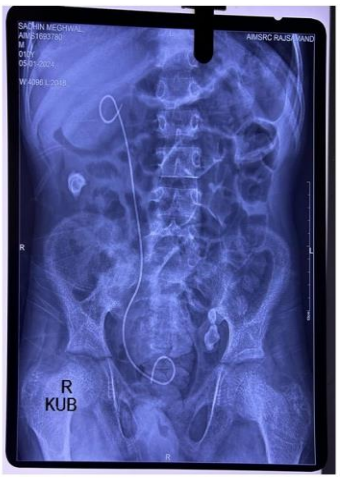
General physical examination revealed microcephaly, dysmorphic facial features, bilateral cataracts, right buphthalmos, pectus carinatum, and gait abnormalities.

Laboratory tests revealed deranged hepatic and renal systems in chronic kidney disease. Ultrasonography of the kidneys, ureters, and bladder revealed moderate right renal calculi, bilateral ureteric calculi, mild left hydronephrosis, cortical thinning, and features suggestive of cystitis in the patient. Neuroimaging (Non contrast computed tomography) [NCCT] brain) revealed cerebral, cerebellar atrophy and phthisis bulbi. Ophthalmological assessment revealed bilateral phthisis bulbi and cataracts.

Based on the clinical and genetic test results, Chopra Amiel Gordon syndrome was diagnosed. Diagnostic molecular analysis revealed autosomal dominant inheritance and a heterozygous pathogenic variant of the ANKRD17 gene.



Discussion

Chopra Amiel Gordon syndrome is a relatively new multisystem neurodevelopmental disorder whose phenotype shows a great deal of variation. The current case exhibits the main characteristics observed in recently reported cohorts, including global developmental delay, speech impairment, microcephaly, abnormal gait, and dysmorphic facial features.[13] Nonetheless, the nature and course of renal disease in this individual significantly enhance the established renal phenotype of CAGS.

ANKRD17-related disorders have rarely been reported to involve the renal pathway and usually involve renal agenesis or accidental structural defects.[1,6] Conversely, bilateral renal and ureteric calculi, hydronephrosis, cortical atrophy, and the development of chronic kidney disease were detected in our patient, suggesting that ANKRD17 may also have a more general role in the development of renal tissue or blood vessels, or in metabolism.

CAGS is known to cause sporadic ophthalmologic involvement. Although strabismus, refractive errors, and cataracts have been described, buphthalmos and phthisis bulbi were present in this patient, indicating severe and progressive ocular disease. These results confirm new evidence of ANKRD17 haploinsufficiency, vascular and developmental instability in several organ systems.[3,8]

Neuroimaging evidence of cerebral and cerebellar atrophy supports the broad impact of ANKRD17 loss-of-function variants in neurodevelopment. The genotype-phenotype relationship indicates that these variants can be associated with more severe clinical derangements.[3]

Anticipatory guidance, specific surveillance, and interprofessional care require early genetic diagnosis. Management is receptive and involves working in conjunction with pediatric nephrology, neurology, ophthalmology, developmental pediatrics, nutrition, and clinical genetics. Genetic counseling would be necessary because the majority are de novo, although there is also evidence of familial inheritance.[1,2]

Conclusion

This case expands the phenotypic range of Chopra–Amiel–Gordon syndrome with severe renal and ophthalmological injuries, causing chronic kidney disease and severe visual deficits. Such expanded manifestations need to be recognized to enable early diagnosis, proper monitoring, and multidisciplinary management. Follow-up reports detailing clinical phenotypes will improve our knowledge of ANKRD17-related disorders and provide a better approach to patient care.

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Conflicts of interest

There are no conflicts of interest.

References

1. Sveden A, Gordon CT, Amiel J, Chopra M. ANKRD17-related neurodevelopmental syndrome. In: GeneReviews®. University of Washington, Seattle; 2022.
2. Tinatin T, Bregvadze K, Gogoberishvili M, et al. A case of Chopra–Amiel–Gordon syndrome with a novel heterozygous variant in the ANKRD17 gene. BMC Medical Genomics. 2023; 16:210.
3. Bayraktutan MC, Sveden A, Belanger R, et al. ANKRD17-related neurodevelopmental syndrome: Further characterization and emerging genotype–phenotype correlations. Genetics in Medicine Open. 2025;102108.
4. Wang J, Liu S, Heallen T, Martin JF. The Hippo pathway in the heart: pivotal roles in development, disease, and regeneration. Nature Reviews Cardiology. 2018; 15:672–684.
5. Bilancia C, Baxter A. Expanding the Chopra–Amiel–Gordon syndrome clinical and molecular spectrum: Two novel deletions involving ANKRD17. Genetics in Medicine Open. 2022;1(1).
6. Chopra M, Amiel J, Gordon CT. ANKRD17 haploinsufficiency and human neurodevelopment. American Journal of Medical Genetics Part A. 2021; 185:2500–2512.
7. von der Lippe C, Shillington A, Herenger Y, et al. Clinical variability in ANKRD17-related neurodevelopmental disorder. European Journal of Human Genetics. 2023; 31:1456–1464.
8. Zuccarelli B, Rosetti L, Engleman K, et al. Vascular complications in ANKRD17-related neurodevelopmental syndrome. Clinical Genetics. 2024; 105:312–320.