Universidad Internacional para el Desarrollo Sostenible
UNIDES
Universidad para un mundo mejor

Revista Universitaria
CIENCIA Y SOCIEDAD

INVESTIGACIÓN INSTITUCIONAL

Caso Clinico enfoque cualitativo

Congenital Adrenal Hyperplasia with Poor Virilization at the Onset: A Case Report

Solano Espinoza, R.F. (ORCID:0009-0006-8355-0244), Díaz Jirón, R.X . (ORCID: 0009-0008-4776-4178); Arauz, E.2(ORCID:0000-0002-3517-2000)

Historia de la investigación:

Publicado en Medical Science and Discovery (ISSN: 2148-6832). Sep 30, 2024

Tomado de:
Solano Espinoza, R., Díaz Jirón, R. X. ., & Arauz, E. . (2024). Congenital Adrenal Hyperplasia with Poor Virilization at the Onset: A Case Report. Medical Science and Discovery, 11(9), 302–304. https://doi.org/10.36472/msd.v11i9.1200

Palabras clave:
Hiperplasia suprarrenal congénita con virilización inicial deficiente

RESUMEN

Objetivo: La hiperplasia suprarrenal congénita (HSC) es un trastorno relativamente raro. Este informe de caso tiene como objetivo destacar los desafíos diagnósticos que enfrentan los médicos cuando las características típicas de la enfermedad no son completamente evidentes.

Caso: El paciente, un bebé de 2 meses, se presentó en la sala de emergencias con vómitos, diarrea, deshidratación y letargo. El examen físico reveló una leve hipertrofia del clítoris. Las pruebas de laboratorio mostraron niveles de sodio de 121 mEq/L y potasio de 5,8 mEq/L, sin hiperpigmentación ni ambigüedad genital. Se sospechó HSC. Debido a las limitaciones de recursos, no se pudieron medir los niveles de 17-hidroxiprogesterona. El tratamiento se inició con prednisona oral (1 mg) y suplementos de cloruro de sodio. Un mes después, después de que otro hospital suspendiera el tratamiento, el paciente fue readmitido con vómitos, deshidratación, hiponatremia e hipercalemia, pero aún no mostraba agrandamiento significativo del clítoris ni hiperpigmentación. La paciente fue estabilizada y dada de alta tras reanudar el tratamiento. En consultas posteriores se observó una escasa ganancia de peso y talla. Al año de edad, la madre refirió agrandamiento del clítoris y erecciones matinales. El tratamiento con fludrocortisona e hidrocortisona oral produjo una mejoría significativa. Un estudio genético confirmó una mutación del gen CYP21A2.

Conclusión: Este caso subraya la complejidad diagnóstica de la hiperplasia suprarrenal congénita en pacientes que inicialmente no presentan una virilización típica. También destaca la importancia de la sospecha clínica y del tratamiento personalizado en entornos con recursos limitados.

[1]*Facultad de Ciencias Médicas-UNIDES*

ABSTRACT

Keywords:
Congenital Adrenal Hyperplasia, poor virilization, 21-hydroxylase deficiency, salt-wasting crisis, CYP21A2 gene mutation

Objective:Congenital adrenal hyperplasia (CAH) is a relatively rare disorder. This case report aims to highlight the diagnostic challenges faced by clinicians when typical characteristics of the disease are not fully evident.

Case:The patient, a 2-month-old infant, presented at the emergency room with vomiting, diarrhea, dehydration, and lethargy. Physical examination revealed mild clitoral hypertrophy. Laboratory tests showed sodium levels at 121 mEq/L and potassium at 5.8 mEq/L, without hyperpigmentationor genital ambiguity. CAH was suspected. Due to resource constraints, 17-hydroxyprogesterone levels could not be measured. Treatment was initiated with oral prednisone (1 mg) and sodium chloride supplementation. One month later, after another hospital discontinued the treatment, the patient was readmitted with vomiting, dehydration, hyponatremia, and hyperkalemia, but still showed no significant clitoral enlargement or hyperpigmentation. The patient was stabilized and discharged after resuming treatment. Subsequent consultations revealed poor weight and height gain. At one year of age, the mother reported clitoral enlargement and morning erections. Treatment with fludrocortisone and oral hydrocortisone led to significant improvement. A genetic study confirmed a CYP21A2 gene mutation.

Conclusion:This case underscores the diagnostic complexity of CAH in patients who do not initially exhibit typical virilization. It also emphasizes the importance of clinical suspicion and tailored treatment in resource-limitedsettings.

Correspondencia:
Solano Espinoza, R.F

Correo electrónico: decanocm@unides.edu.ni

Introduction

Congenital Adrenal Hyperplasia (CAH) refers to a group of autosomal recessive disorders that result in complex hormonal imbalances due to enzyme deficiencies in the adrenal steroidogenesis pathway. The most common form is a 21-hydroxylase deficiency [1]. Other less common enzymatic defects include deficiencies in 11β-hydroxylase, 17-hydroxylase, 3 β-hydroxysteroid dehydrogenase, and 18-hydroxylase [2].

The first documented case of CAH was described in 1865 by Neapolitan anatomist Luigi De Crechio. His autopsy report detailed a patient with ambiguous genitalia, including fused scrotal lip folds, a 10 cm phallus with hypospadias, and absent testicles. Internally, the patient had female reproductive organs, including a uterus and ovaries, alongside enlarged adrenal glands. The individual, identified as male during adulthood, likely succumbed to adrenal insufficiency in his 40s, following a salt-wasting crisis involving vomiting, diarrhea, and dehydration [3].

Salt-wasting adrenal hyperplasia represents the most severe form of CAH. The total absence of enzyme activity leads to markedly reduced levels of cortisol and aldosterone, with a concurrent rise in androgens, causing prenatal virilization in females. Without early intervention, infants may experience life-threatening salt-loss crises within weeks of birth [4].

Newborn screening programs have since been introduced to detect CAH early, reducing diagnostic delays and preventing severe salt-loss episodes. This screening has also resolved gender-based disparities in diagnosis, as undiagnosed male cases, previously more common, were often fatal [5]. In recent years, advances ingenetic analysis have enabled the identification of numerous CAH variants, further enhancing diagnostic precision [6].

Case

A 2-month-old female infant was admitted to the emergency department with repeated episodes of vomiting (five times) and diarrhea (ten occurrences within 24 hours), resulting in moderate dehydration. Physical examination revealed dry mucous membranes, a mildly depressed fontanelle, generalized pallor, and blood pressure of 80/50 mmHg. The patient was alert, and there was slight clitoral hypertrophy but no evidence of genital hyperpigmentation.

Laboratory tests indicated blood glucose levels of 114 mg/dL, sodium at 121 mEq/L, and potassium at 5.8 mEq/L, prompting a suspected diagnosis of CAH. Immediate treatment was initiated with oral prednisone (1 mg/day) and sodium chloride supplementation. The patient responded well and was discharged.

A month later, the mother sought treatment at a different hospital where the prednisone and sodium supplementation were discontinued. Two weeks later, the patient returned with vomiting, dehydration, sodium at 120 mEq/L, and potassium at 6 mEq/L. Following rehydration and the resumption of treatment, the patient stabilized and was discharged after five days.

By one year of age, the child weighed only 4.6 kg and measured 63 cm in height, raising doubts about the initial diagnosis of CAH. The mother reported significant clitoral enlargement and morning erections. The family later obtained fludrocortisone and oral hydrocortisone, leading to substantial improvements. Genetic testing confirmed a mutation in the CYP21A2 gene.

Discussion

CAH most commonly results from a deficiency in 21-hydroxylase, manifesting in two primary forms: one causing external genital virilization, and the other leading to salt-loss crises, which, if undiagnosed, can be fatal [1, 2]. In this case, the patient experienced salt-loss episodes without pronounced virilization, although virilization became evident later in the clinical course. Treatment with oral prednisone and sodium chloride supplementation successfully stabilized the patient during these crises. The absence of hyperpigmentation initially complicated the diagnosis when the patient was seen at another facility.

Resource limitations prevented timely measurement of 17-hydroxyprogesterone or genetic testing during the initial presentation. Follow-up evaluations by the Pediatric Endocrinologist revealed poor weight and height gain, suggesting the possibility of a rarer aldosterone synthesis deficit rather than the more common CAH. Treatment with

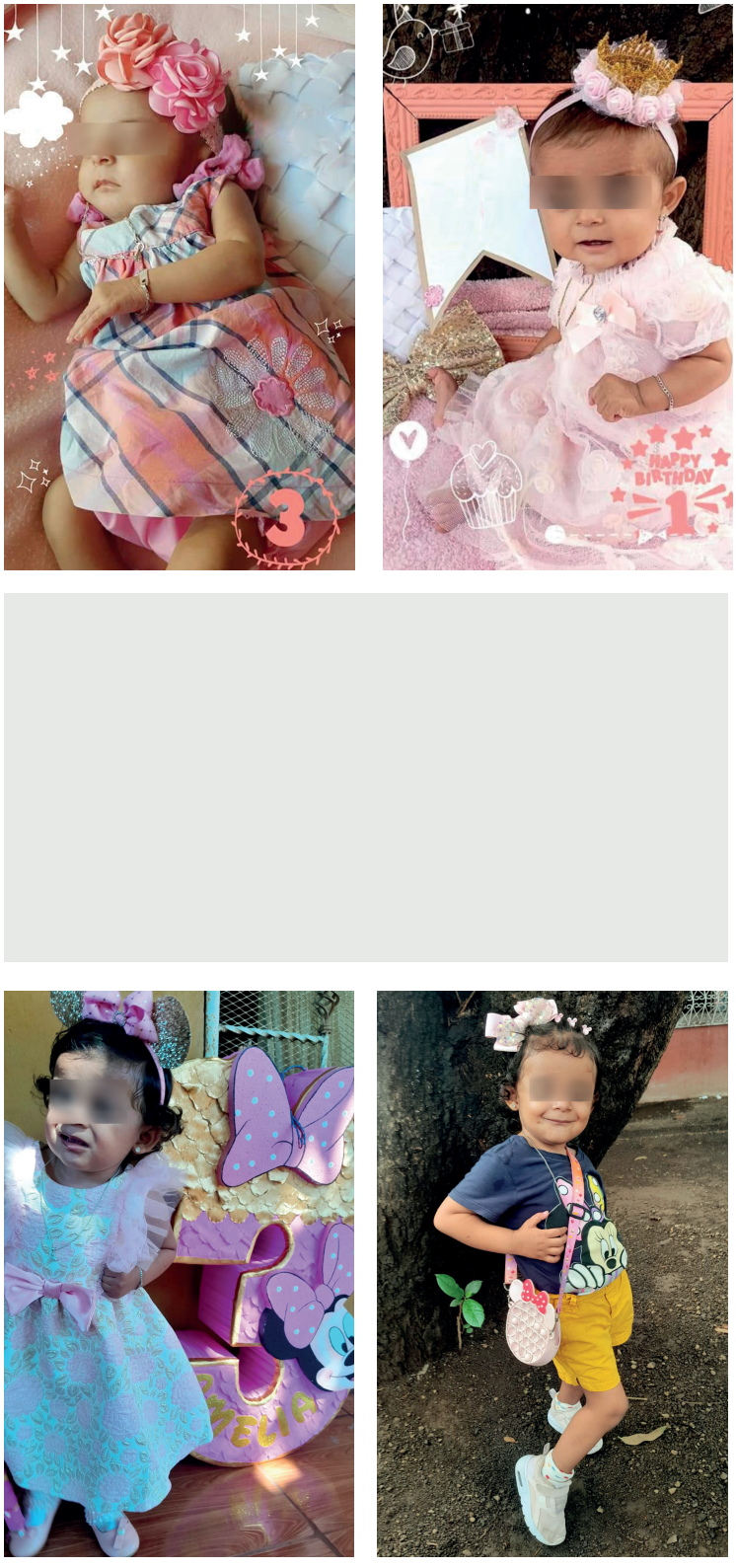


Figure 1: Long-term follow-up in CAH Case

fludrocortisone and oral hydrocortisone led to remarkable clinical improvement, with the patient reaching 12.5 kg in weight and 88 cm in height by the age of three.

Conclusion

CAH presents with a wide spectrum of clinical manifestations, and there is often no direct correlation between genotype and phenotype. This case illustrates the importance of maintaining clinical suspicion, especially in resource-limited settings, where diagnostic tools may be lacking. The findings highlight the need for improved diagnostic and treatment capabilities in resource-poor regions to manage such complex conditions effectively.

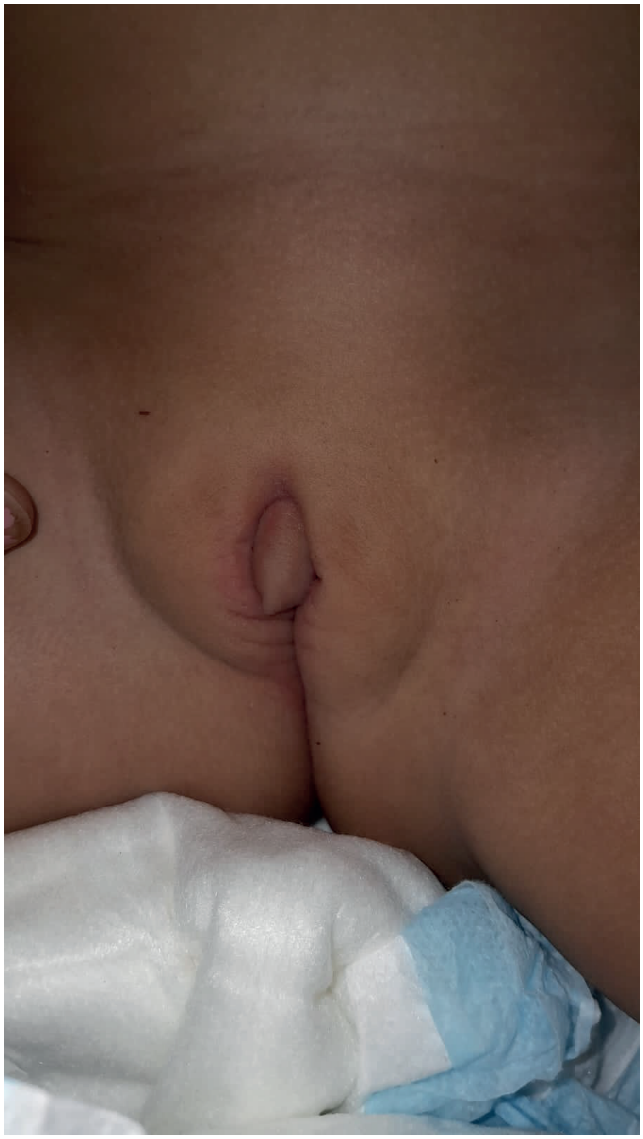
Acknowledgments: We thank Dr. Jorge Luis Espinoza for facilitating the genetic study at the University of Japan and the International University for Sustainable Development for covering the study's costs.

Conflict of Interest: The authors declare no conflict of interest. The study was solely funded by the researchers. No institutional or corporate body funding was used for the study.

Ethical approval: The present study was conducted in strict in accordance with the principles outlined in the Declaration of Helsinki.

Authors' Contribution

Conceptualization: RS, RD, EA
Data curation: RS, RD, EA
Formal analysis: RS
Funding acquisition: No funds were received.
Investigation: RS, RD, EA
Methodology: RS
Project administration: RS
Resources: ScholarGoogle,Webof Science, Pubmed
Software: SPSS
Supervision: RS
Validation: RS
Visualization: RS, RD, EA
Writing–original draft: RS
Writing–review & editing: RS



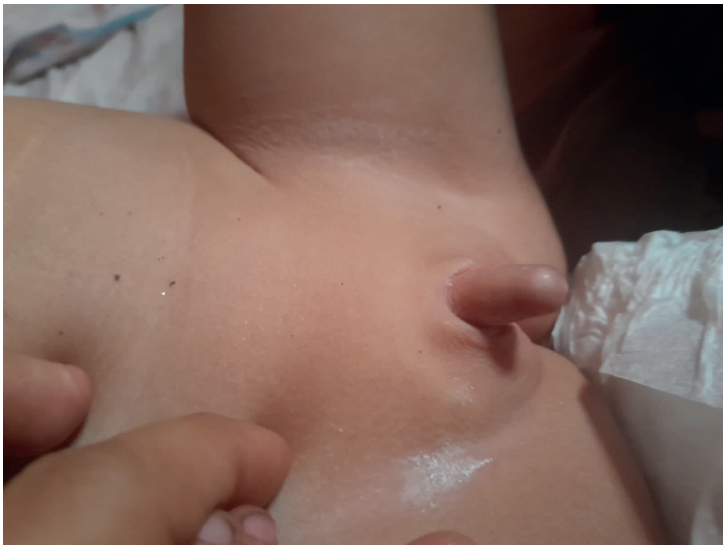


Figure 2: A-B female genitalia in CAH Case

References

1. Auer MK, Nordenström A, Lajic S, Reisch N. Congenital adrenal hyperplasia. Lancet. 2023 Jan 21;401(10372):227-244. doi: 10.1016/S0140-6736(22)01330-7. PMID: 36502822

2. Witchel SF. Congenital adrenal hyperplasia. J Pediatr Adolesc Gynecol. 2017 Oct;30(5):520-534. doi: 10.1016/j.jpag.2017.04.001. PMID: 28450075; PMCID: PMC5624825.

3. Miller WL, White PC. A brief history of congenital adrenal hyperplasia. Horm Res Paediatr. 2022;95(6):529-545. doi: 10.1159/000526468. PMID: 36446323.

4. Tsuji-Hosokawa A, Kashimada K. Thirty-year lessons from the newborn screening for congenital adrenal hyperplasia (CAH) in Japan. Int J Neonatal Screen. 2021 Jun 29;7(3):36. doi: 10.3390/ijns7030036. PMID: 34209888; PMCID: PMC8293132.

5. Heather NL, Nordenström A.Newborn screening for CAH-challenges and opportunities. Int J Neonatal Screen. 2021 Feb 13;7(1):11. doi: 10.3390/ijns7010011. PMID: 33668620; PMCID: PMC8006248.

6. Claahsen-van der Grinten HL, Speiser PW, Ahmed SF, Arlt W, Auchus RJ, Falhammar H, et al. Congenital adrenal hyperplasia-current insights in pathophysiology, diagnostics, and management. Endocr Rev. 2022 Jan 12;43(1):91-159. doi: 10.1210/endrev/bnab016. PMID: 33961029; PMCID: PMC8755999.