Article published online: 2022-12-02

Challenges of Management of Congenital Adrenal Hyperplasia in Developing Countries

Hussain Alsaffar[1]

[1] Child Health Department, Sultan Qaboos University Hospital, Muscat, Oman

J Diabetes Endocrine Practice 2022;5:52–53.

Address for correspondence Hussain Alsaffar, FRCPCH, Paediatric Endocrine and Diabetes Unit, Child Health Department, Sultan Qaboos University Hospital, Muscat, 123, Oman (e-mail: hussaina@squ.edu.om).

Congenital adrenal hyperplasia (CAH) is an autosomal recessive disease, resulting in adrenal cortical enzyme deficiencies that affect the steroidogenesis process within the adrenal glands, leading mainly to an impairment of glucocorticoid biosynthesis. But it can also affect the mineralocorticoid and androgen pathways, with variable severity depending on which enzyme is defective[1] and the percentage of loss of function. Therefore, the presentation of patients is widely variable. Early presentation within the neonatal period is mainly related to either ambiguity of genitalia as a disorder of sexual development or salt-losing classical CAH, whereas the simple virilizing type of patients may present during early childhood within 2 to 4 years of life. While patients with nonclassical CAH do present during adolescence, it is not uncommon to get their diagnosis confused with one of the other differential diagnoses such as polycystic ovary syndrome. A delay in the diagnosis of classical CAH can be associated with an increased risk of morbidity or mortality.[2]

Many countries had added to their newborn screening programs, testing for CAH by measuring 17-hydroxyprogesterone level in dried blood obtained by heel pricking. In New Zealand as an example, this screening had been incorporated almost four decades ago when it was launched for the first time in 1984. Saying that Saudi Arabia and the United Arab Emirates had expanded their screening program to include CAH testing at the beginning of the millennium.[3] But many other countries in the Middle East and North Africa region are still not screening for CAH even though the incidence of CAH is higher in Eastern Mediterranean, which is thought to be due to consanguinity, and less genetic diversity.[4]

Since this group of disorders is characterized by cortisol deficiency, therefore steroid replacement is fundamental in treatment. Not just to prevent the complications of hypocortisolemia but also to suppress the elevated adrenocorticotrophic hormone (ACTH), the responsible factor for more androgens production due to the diversion resulting from the enzymatic block of the synthesis pathway. Therefore, appropriate treatment will result in reduced virilization in addition to restoring disturbed functions because of glucocorticoid deficiency. The drug of choice is hydrocortisone, and in its absence, clinicians may use prednisolone but certainly not dexamethasone due to its very long half-life and the risk of developing Cushing's syndrome. Regarding the electrolyte imbalance resulting from mineralocorticoid deficiency, fludrocortisone is the drug of choice, and sometimes, early on in treatment, sodium chloride (salt) is also needed to be added on, and then it gets weaned off as the child grows up. In a quick literature review, it was difficult to know the availability of the above-mentioned medications in developing countries. Some patients are of course candidates for surgical corrections such as feminizing genitoplasty and again minimal information is available of when to intervene and what challenges were faced!

In the current issue of Journal of Diabetes and Endocrine Practice (JDEP), Abulgassem and Ben Rajab[5] shared their experience with CAH management in Tripoli Children's Hospital, Tripoli, Libya. A case series study was conducted on patients with CAH who attended and followed up in their Paediatric Endocrine Clinic for over 18 years. A total of 58 patients were studied, in which 38 were females, giving a male-to-female ratio of 1:1.9. The presentation and the last visit captured demographics and clinical features of the patients, including the presenting features at the time of diagnosis, growth parameters, type of CAH, investigations, and treatment details. Age at presentation in 94.8% ranged between 1 day and 10 years with a mean age of 2.3 years.

DOI https://doi.org/10.1055/s-0042-1758769.
ISSN 2772-7653.

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

"Ambiguous genitalia" was the presented feature in 55.2 and 84% of the total and female patients, respectively, whereas salt wasting was the presenting cause in 38% of patients. Of 32 female patients with ambiguous genitalia, only 11 out of them (19% of all patients) had a surgical correction. All patients underwent biochemical testing and hormonal assays. Biochemical disturbances improved after treatment. Also, all hormonal findings included levels of ACTH, 17 hydroxyprogesterone, and plasma renin activity; all levels were reduced with treatment. In this single-center case series, most biochemical and hormonal abnormalities patients normalized on replacement therapy with minimal surgical correction of females who had "ambiguous genitalia" initially. The authors highlighted some of the challenges in managing these patients at times of civil and armed conflicts.

Such studies are very important to enrich the scientific field with information about what is happening in developing countries. Perhaps such studies can encourage others from similar grounds and clinical setups to start sharing their experience, and challenges faced by healthcare professionals as well as patients and their carers. Once data became available, and awareness is raised; some international organizations, charities, and local health authorities might collectively maintain, support, and/or even improve the services whenever possible and applicable. Therefore, I would encourage the readers to formulate different teams and carry on an international multicenter study to look at the epidemiology, neonatal screening, diagnostic challenges, availability and accessibility of medications, the structure of the services, and existence of the multidisciplinary team (MDT) concept, service evaluation, complications, and long-term outcomes, sociocultural and religious involvement, and finally business case study to look at the financial burden of CAH on the health economics of those countries, especially in the countries where the consanguinity is common, such as the Middle East.

In such a highly complex disorder, a MDT approach is deemed necessary, including an endocrinologist, clinical geneticist, neonatologist, surgeon, psychologist, and in the long run a fertility specialist. However, with the minimal reporting about the diagnosis, management, and challenges of dealing with CAH in the developing world, whether in low, mid, or high-income countries, we cannot tell what kind of healthcare services the patients are receiving. And what are their or their caregivers' expectations and satisfaction?

Author's Contribution
Single authorship.

Compliance with Ethical Principles
Ethical approval is not required.

Funding and Sponsorship
None.

Conflict of Interest
None declared.

References

1 Turcu AF, Auchus RJ. Adrenal steroidogenesis and congenital adrenal hyperplasia. Endocrinol Metab Clin North Am 2015;44 (02):275–296
2 Speiser PW, Arlt W, Auchus RJ, et al. Congenital adrenal hyperplasia due to steroid 21-hydroxylase deficiency: an endocrine society clinical practice guideline. J Clin Endocrinol Metab 2018; 103(11):4043–4088
3 Skrinska V, Khneisser I, Schielen P, Loeber G. Introducing and expanding newborn screening in the MENA region. Int J Neonatal Screen 2020;6(01):12
4 Navarro-Zambrana AN, Sheets LR. Ethnic and national differences in congenital adrenal hyperplasia incidence: a systematic review and meta-analysis. Horm Res Paediatr 2022. Doi: 10.1159/000526401
5 Abulgassem I, Ben Rajab F. Experience with congenital adrenal hyperplasia in Tripoli Children's Hospital, Libya. J Diab Endocr Pract 2022;5(02):73–79

