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ORIGINAL ARTICLE

Assessment of the Frequency of Different Patterns of Clinical Presentation of Children Presenting with Congenital Adrenal Hyperplasia

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ABSTRACT

Background: Congenital suprarenal hyperplasia is an autosomal recessive condition that is characterized by defects in some of the 5-enzymes required for cortisol synthesis. Literature indicates a high incidence of salt depletion and genital virilization in children with congenitally adrenal hyperplasia. The purpose of this study was to examine the prevalence of clinical patterns in children with congenital adrenal hyperplasia.

Material and methods

Study design: Cross sectional study

Setting: Department of Pediatric, Fatima Memorial Hospital, Lahore.

Duration: 6 months i.e. 19-12-2019 to 18-06-2020

Data collection: 92 infants who met the inclusion criteria were included in the study. Blood sample was obtained, if serum sodium was <135mEq/L, salt depletion was labeled. Then, genital examination for assessment of genital virilization was done. All data was entered in specially designed Performa and analyzed in SPSS.

Results: The mean age of patients was 6.52±3.56 months. There were 49 (53.26%) male while 43 (46.74%) female infants. The mean weight of patients was 5.59±1.44 kg. There were 21 (22.83%) cases of consanguineous marriage while 71 (77.17%) were others. 63 (68.48%) had salt depletion while 29 (31.52%) did not had salt depletion. 39 (42.39%) patients had genital virilization while 53 (57.61%) did not have genital virilization.

Conclusion: The frequency of patterns (salt depletion and genital virilization) of Congenital adrenal hyperplasia are high in local population.

Keywords: Patterns, salt depletion, genital virilization, congenital adrenal hyperplasia, infants, consanguineous marriage.

INTRODUCTION

CNH is a recessive autosomal disease with mutations in each of the 5 enzymes needed to synthesize cortisol.1 This affects about one out of 18,000 living born babies in the UK, but not everyone is diagnosed in the first year of their life. Newborn screening is not performed in the United Kingdom for Congenital Adrenal Hyperplasia, but the National Scresening Committee investigates this.2 In 95% of the cases, 21-hydroxylease enzyme (21OH) deficiency was found contributing to decreased cortisol and aldosterone synthesis.

In inherited females, the marked virility of this disease is marked4. The overproduction of androgens triggers prenatal and postnatal virilisation. The degree of enzyme deficit varies with congenital adrenal hyperplasia. Ambiguous genitals of females at birth are likely to contribute normally to early diagnosis and treatment. After some years, the affected males can be unnamed before androgen imbalance symptoms and signs occur. The age at which kids are diagnosed depends by the magnitude of the loss of aldosterone. Severe salt waste patients with 2-3 weeks of surrender including vomiting, weight loss, lethargy, dehydration, hyponatraemia, hypercalaemia, and shock are present in their lives. In males who have no genital ambiguity for alerting physicians to the risk of adrenal hyperplasia, this problem is particularly crucial 5,6.

Prenatal virilisation in newborn females and waste of salt in either gender may take place in the neonatal cycle because of total deficiency in the enzyme 3.

In a study of 82 cases it showed that there was a high consanguinity rate (71.2%), 95% had salt depletion and 52% had sexual virilisation.9 A further study of 28 cases showed 60.7% had salt depletion and 39.3% had genital virilisation.[9] But a study of 58 cases showed that 0% had salt depredation while genius had saline depletion. The reason for the study is to evaluate the frequency with which children with congenital adrenal hyperplasia present in different patterns. Congenital adrenal hyperplasia has demonstrated high incidence of salt and genital virilisation in baby children, but literature has also shown controversial evidence. The aim of this research is therefore to validate whether these complications are high in local populations since there is no local literature data on the pattern of congenital adrenal hyperplasia presentation. This research was carried out on a large sample to achieve more authentic findings specific to the local population.

MATERIALS AND METHODS

For a total of 6 months after acceptance of the synopsis (19-12-19-19-05-2020) a cross-sectional analysis was performed at the Pediatric Department of Fatima Memorial Hospital, Lahore. Sample measurements were calculized with a 95 % confidence rating, 10% error margin, and the expected 39.9% for children with congenital adrenal hyperplasia. Sample size was measured. Unlikely and successive sampling was undertaken. Children aged 1 to 12 months, all of which have adrenal hyperplasia Congenital were included. Infants were told that prevalent cases in which parents were not able to participate in the trial were removed from the first month of the report, and infants suffering from other congenital problems (chromosomal abnordicity, neural tube defects, cerebral paralysis).

The emergency report by the Department of Pediatrics, Fatima Memorial Hospital, Lahore has included 92 children who fulfilled the inclusion requirements. After taking informed consent from parents, demographic variables (name, age, weight, gender, contact) were also collected. The blood sample was then obtained using an aseptic syringe of 3cc BD with the help of a staff nurse. For the serum sodium level assessment, samples were sent to the laboratory of the hospital. Where sodium is less than 135 mEq / L, salt depletion (by operational definition) has been labeled. Then, the child was subject to genital evaluation (by operational definition) to determine genital virility. SPSS version 20 data were entered and analysed. The mean and standard deviation were quantitative variables such as age and weight. As a frequency and percentage, Qualitative variables such as gender and pattern of Congenital SUH were presented (salt depletion and genital virilization). The data were stratified by means of chi-square tests

for age, gender, children's weight, consanguine and stratified classes. P to 0.05 has been considered significant.

RESULTS

The mean age of patients was 6.52±3.56 months. As shown in Table 1, there were 49 (53.26%) male while 43 (46.74%) female infants. The mean weight of patients was 5.59±1.44 kg. There were 21 (22.83%) cases of consanguineous marriage while 71 (77.17%) were other than cousin marriage. There were 63 (68.48%) patients who had salt depletion while 29 (31.52%) did not had salt depletion. There were 39 (42.39%) infants who had genital virilization while the rest of them (57.61%) did not have it.

For further analysis, data was stratified for age of patients as is mentioned in Table 2. In patients aged ≤6 months, salt depletion was found in 31 (72.1%) cases. In patients aged >6 months, salt depletion was found in 32 (65.3%) cases. The difference was insignificant (p>0.05). Data was stratified for gender of patients. In male patients, salt depletion was found in 37 (75.5%) cases. In female patients, salt depletion was found in 26 (60.5%) cases. The difference was insignificant (p>0.05). Data was also stratified for weight of patients. In patients weighed 3.0-5.5kg, salt depletion was found in 30 (71.4%) cases. In patients weighed 5.6-8.0kg, salt depletion was found in 33 (66.0%) cases. The difference was insignificant (p>0.05). Similarly, data was stratified for consanguineous marriage. In patients with consanguineous marriage, salt depletion was found in 11 (52.4%) cases. In patients without consanguineous marriage, salt depletion was found in 52 (73.2%) cases. The difference was insignificant (p>0.05).

Table 1: Descriptive Statistics of patients

Variable	Gender		Consanguineous marriage		Age (years)	Weight (kg)
	Female	Male	Yes	No		
N (%)	43 (46.74 %)	49 (53.26 %)	21 (22.83 %)	71 (77.17%)	92	92
Mean					6.52	5.59
SD					3.56	1.44
Minimum					01	3.0
Maximum					12	8.0

SD= Standard Deviation, N= Number

Table 2: Comparison of salt depletion in various categories of patients

Variable		Salt Depletion		Chi -Square	p-value
		Yes	No		
Age (months)	<6 months	31	32	0.489	0.485
		72.1%	65.3%		
	>6 months	12	17		
		27.9%	34.7%		
Gender	Male	37	12	2.402	0.121
		75.5%	24.5%		
	Female	26	17		
		60.5%	39.5%		
Weight (kg)	3.0-5.5	30	12	0.312	0.577
		71.4%	28.6%		
	5.6-8.0	33	17		
		66.0%	34.0%		
Consanguineous marriage	Yes	11	52	3.267	0.071
		52.4%	73.2%		
	No	10	19		
		47.6%	26.8%		

Chi-square test was applied. p-value significance set at p<0.05

Table 3 shows that for age of patients, among patients aged ≤6months, genital virilization was found in 13 (30.2%) cases. In patients aged >6months, genital virilization was found in 26 (53.1%) cases. The difference was significant (p<0.05). Data was stratified for gender of patients. In male patients, genital virilization was found in 17 (34.7%) cases. In female patients, genital virilization was found in 22 (51.2%) cases. The difference was insignificant (p>0.05). In patients weighed 3.0-5.5 kg, genital virilization was found in 15 (35.7%) cases. In patients weighed 5.6-8.0kg, genital virilization was found in 24 (48.0%) cases. The difference was insignificant (p>0.05). In patients with consanguineous marriage, genital virilization was found in 8 (38.1%) cases. In patients without consanguineous marriage, genital virilization was found in 31 (43.7%) cases. The difference was insignificant (p>0.05).

Table 3: Comparison of genital virilization in various categories of patients

Variable		Genital Virilization		Chi -Square	p-value
		Yes	No		
Age (months)	<6 months	13	30	4.887	0.027*
		30.2%	69.8%		
	>6 months	26	23		
		53.1%	46.9%		
Gender	Male	17	32	2.544	0.111
		34.7%	65.3%		
	Female	22	21		
		51.2%	48.8%		
Weight (kg)	3.0-5.5	15	27	1.411	0.235
		35.7%	64.3%		
	5.6-8.0	24	26		
		48.0%	52.0%		
Consanguineous marriage	Yes	8	13	0.206	0.650
		38.1%	61.9%		
	No	31	40		
		43.7%	56.3%		

Chi-square test was applied. p-value significance set at p<0.05

DISCUSSION

A deficiency of 21-hydroxylase (21-Oh) in the enzyme, normally decreasing cortisol and aldosterone secretion while at the same time increasing androgen development, causes congeital adrenal hyperplasia to be an autosomal recessive condition. In the treatment of congenital adrenal hyperplasia, development is considered a major problem because children sometimes struggle to achieve their target height. Congenital adrenal hyperplasia is treated based on the administration of glucocorticoid or mineralocorticoid, which reduces the excess of adrenal androgen stimulated by the adrenocorticotropic hormone. In order to achieve adequate androgen reduction, higher doses of hydrocortisone and subsequent hypercortisolism could be appropriate.

In our study, there were 63 (68.48%) had salt depletion while in 29 (31.52%) did not had salt depletion. There were 39 (42.39%) had genital virilization while in 53 (57.61%) did not had genital virilization. In a study, conducted on 82 cases it was showed that consanguinity rate was high (71.2%), 95% had salt depletion and 52% had genital virilization. These results indicate the importance of physicians' awareness and the need for a neonatal screening program for early detection and appropriate management[9]. In addition, 28 cases, 60.7% of cases show salt depletion and 39.3% genital virilisation, according to a further study. Bad growth of children with salt waste The age and start of treatment, the doses of glucocorticoid or fludrocortisones or saline therapy were not associated to congenital adrenal hyperplasia. The SDS below -2 is correlated with a more desirable increase in growth for men and baseline lengths. More forward-looking studies are required including undercurrent diseases and diet.

But one study conducted on 58 cases found that 0 percent cases had salt degradation while genital virilization was observed in 14 percent cases only. Newborn screening can prevent extreme clinical symptoms in older children with unknown Congenital suparis, but certain children who may not otherwise be asymptomatic may also be identified and for whom the benefit from treatment is unknown. Patient age data have been stratified. Salt loss resulted in 31 (72.1 percent) cases in patients aged 6 months. Salt depletion was observed in 32 (65%) cases in patients > 6 months of age. There was no variation (p>0.05). Data was stratified for age of patients. In patients aged ≤6months, genital virilization was found in 13 (30.2%) cases. In patients aged

>6months, genital virilization was found in 26 (53.1%) cases. The difference was significant (p<0.05).

There were 49 (53.26%) male while 43 (46.74%) female infants. Data was stratified for gender of patients. In male patients, salt depletion was found in 37 (75.5%) cases. In female patients, salt depletion was found in 26 (60.5%) cases. The difference was insignificant (p>0.05). Data was stratified for gender of patients. In male patients, genital virilization was found in 17 (34.7%) cases. In female patients, genital virilization was found in 22 (51.2%) cases. The difference was insignificant (p>0.05). The mean weight of patients was 5.59±1.44 kg. Data was stratified for weight of patients. In patients weighed 3.0-5.5kg, salt depletion was found in 30 (71.4%) cases. In patients weighed 5.6-8.0kg, salt depletion was found in 33 (66.0%) cases. The difference was insignificant (p>0.05). Data was stratified for weight of patients. In patients weighed 3.0-5.5kg, genital virilization was found in 15 (35.7%) cases. In patients weighed 5.6-8.0kg, genital virilization was found in 24 (48.0%) cases. The difference was insignificant (p>0.05).

There were 21 (22.83%) cases of consanguineous marriage while 71 (77.17%) were other than cousin marriage. Data was stratified for consanguineous marriage. In patients with consanguineous marriage, salt depletion was found in 11 (52.4%) cases. In patients without consanguineous marriage, salt depletion was found in 52 (73.2%) cases. The difference was insignificant (p>0.05). Data was stratified for consanguineous marriage. In patients with consanguineous marriage, genital virilization was found in 8 (38.1%) cases. In patients without consanguineous marriage, genital virilization was found in 31 (43.7%) cases. The difference was insignificant (p>0.05).

CONCLUSION

Thus, the frequency of patterns (salt depletion and genital virilization) of Congenital adrenal hyperplasia are high in local population. Now the high prevalence has been proved. Now we will implement these results in local population and screen the patients in Congenital adrenal hyperplasia patients to avert complications in future.

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