ORIGINAL ARTICLE

Congenital Chloride Diarrhoea In Relation With Renal Complications

[1]IQTADAR SEERAT, [2]MUHAMMAD ARSHAD ALVI
[1]Consultant Paediatric Gastroenterology, Hepatology & Nutrition, King Faisal Specialist Hospital & Research Centre, Jeddah, Kingdom of Saudi Arabia, [2]Assistant Consultant, Paediatric Gastroenterology, Hepatology & Nutrition, King Faisal Specialist Hospital & Research Centre, Jeddah, Kingdom of Saudi Arabia.
Correspondence: Dr Iqtadar Seerat, Consultant Paediatric Gastroenterology, Hepatology & Nutrition, King Faisal Specialist Hospital & Research Centre, Jeddah, Kingdom of Saudi Arabia.
Contact No: 00966559629265 Email: iseerat@hotmail.com

ABSTRACT
Objective: To assess the significance of early detection of renal complications in children with congenital chloride diarrhoea.
Study Design: Retrospective study.
Place and Duration of Study: This study was done for the time period from March, 2003- September, 2016 in the department of Paediatric Gastroenterology, Hepatology & Nutrition, KFSH&RC, Jeddah.
Materials & Methods: This retrospective study was carried out for the time period starting from March, 2003- September, 2016 for 19 confirmed cases of congenital chloride diarrhoea at KFSH&RC, Jeddah.
Results: Out of19 cases we found 13(68.4%) patients with renal abnormalities. We found 2 cases (15.3%) with end stage renal disease, 3 cases (23%) of nephrocalcinosis, 7 cases (53.8%) with increased echogenicity of both kidneys and 1 case (7.6%) of renal stones.
Conclusion: We conclude that by increasing the level of understanding of disease and keeping good compliance with daily medications, the renal complications could be prevented to improve the outcome.

Key Words: Congenital chloride diarrhoea (CLD), renal complications, compliance, outcome.

INTRODUCTION
CLD is a rare autosomal recessive disease which causes chronic secretory watery diarrhoea resulting in high concentration of chloride in faeces.[2] The basic genetic defect is caused by mutations in the SLC26A3 gene.

Antenatally it presents with polyhydramnios and dilated bowel loops which are picked up on ultrasound scans.[3] The basic abnormality of the disease is caused by the absence or impairment of active chloride/ bicarbonate exchange in the small intestine and colon.[4,5,6,7] The diagnosis is established when faecal chloride concentration is more than 90 mmol/l after correction of water and electrolyte deficits. Congenital chloride diarrhoea should be treated with oral electrolytes and water as a replacement for faecal losses. This adequate replacement therapy helps to maintain normal growth & development and to prevent renal disease. In the literature a very few studies have been reported with regards to the renal involvement in children with congenital chloride diarrhoea. In this study we evaluate the renal abnormalities in our 19 cases of congenital chloride diarrhoea confirmed by genetic testing. In all our cases there was p G187X mutation in exon 5 of the gene SLC26A3.

MATERIALS AND METHODS
This retrospective study was conducted for 19 confirmed cases of congenital chloride diarrhoea at KFSH&RC, Jeddah. All our cases were confirmed with genetic testing. The data was collected from the ICIS used in hospital power chart system. The data was presented in form of a bar chart and a table.

RESULTS
In this retrospective study a total of 19 confirmed cases of children with congenital chloride diarrhoea between birth and 14 years of age were included. The data in table 1 shows the age of presentation, age of diagnosis, severity of diarrhoea, family history of CLD and doses of sodium & potassium required in this group of children.

Table 1: Demographic data for 19 children with congenital chloride diarrhoea

Age of presentation	Since birth=8(n=19)	4months =11(n=19)	12months=0(n=19)
Age of diagnosis	1month =5(n=19)	4months=7(n=19)	12month=7(n=19)
Frequency of loose motion	3-4/day=3(n=(n=19)	4-6/day=10(n=19)	7-8/day=6(n=19)
Sodium requirement	<1mmol/Kg/Day=11(n=19)	1-1.5mmol/Kg/Day=6(n=19)	>1.5mmol/Kg/Day=2(n=19)
Potassium requirement	1-2mmol/Kg/Day=6(n=19)	2.1-3mmol/Kg/Day=10(n=19)	3.1-6mmol/Kg/Day=3(n=19)
Family H/O disease	Siblings=6(n=19)	First degree relatives=2(n=19)	No family history=11(n=19)

In total of 19 cases we found 13 patients (68.4%) with renal abnormalities. Out of 13 there were 2 cases (15.3%) with end stage renal disease, 3 cases (23%) of nephrocalcinosis, 7 cases (53.8%) with increased echogenicity of both kidneys and 1 case (7.7%) of renal stones as shown in figure 1.

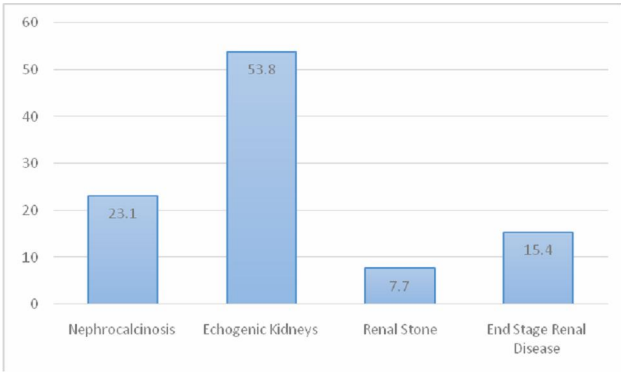

Figure-1: Spectrum of renal abnormalities in 13 patients

DISCUSSION

Different studies are reported in the literature showing variable incidence rates of congenital chloride diarrhoea in different parts of the world. It varies from 1:43000 in Finland, 1:3200-13000 in Kuwait, and in Saudi Arabia it is reported to be 1:5500 live birth/year.[8]The high incidence of CLD among Arab communities may be related to a high gene carrier state and increased consanguineous marriages.

Despite of the fact that the prognosis in the Finnish series of children with congenital chloride diarrhoea is reasonably good, the relatively high incidence(28%)of chronic renal disease underlines the importance of prompt diagnosis, adequate treatment and regular monitoring of these patients.[9,10,11] Renal involvement in congenital chloride diarrhoea has been documented previously.[12,13,14,15] The renal damage may be linked with not picking up the disease early especially during infancy and insufficient treatment. The inadequate treatment causes dehydration and activation of the renin-aldosterone system[16]. Due to inadequate electrolytes replacement, the reduced volume of kidneys in renal disease could cause further worsening of renal functions. The probable pathogenesis for chronic renal failure involves loss of water and electrolytes and subsequently calcium is not absorbed by renal tubules which results in intra tubular damage. The examination of renal biopsy specimens taken from cases who have had an appropriate electrolytes replacement since birth showed that renal functions were unimpaired and renal histology was normal.[17] Hence renal involvement is a secondary feature of congenital chloride diarrhoea which develops as a result of inadequate replacement therapy.

The studies have shown that by early diagnosis and institution of treatment the outcome of disease could be improved. [18,19]

In our study 68.4% children with congenital chloride diarrhoea were found to have renal manifestations. This is mainly due to inclusion of echogenic kidneys (53.85%) which we were able to detect on serial renal ultrasound scans. The echogenic kidneys may be early manifestation of the renal disease in children with congenital chloride diarrhoea. Therefore this important finding perhaps alerts us to target and screen these patients by performing regular renal ultrasound scans and blood tests especially for renal profile to avoid any further renal damage. Out of 13 children

3 cases (23%) have nephrocalcinosis, 2 (15%) children have chronic renal failure. The first child with chronic renal failure has already had a renal transplant and second one is going to have it in the near future. Majority of our patients had not shown good compliance with medications. We also observed that there was a lack of understanding of disease in our group of patients and parents.

CONCLUSION

We conclude that by increasing the level of understanding of disease and keeping good compliance with daily medications the renal complications could be prevented to improve the outcome.

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