Fanconi-Bickel Syndrome in Sudanese children, Case series

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Introduction

Fanconi-Bickel syndrome (FBS), is a rare autosomal recessive disorder of carbohydrate metabolism (FBS, OMIM 227810), caused by defects in the facilitative glucose transporter glut-2, which transports glucose in and out of hepatocytes, pancreatic β cells and basolateral membranes of intestinal and renal epithelial cells. Characteristic features include growth failure, hepatomegaly, glucose and galactose intolerance, fasting hypoglycemia, and renal tubular nephropathy.

Patients & Methods

- Eight patients from seven different Sudanese families were included in this series.
- Features of FBS were documented in all patients (growth failure, hepatomegaly, glucose and galactose intolerance, fasting hypoglycemia, and renal tubular nephropathy).
- Laboratory work-up included urinalysis, renal and liver function tests, fasting and postprandial blood sugar, serum calcium, phosphorus, alkaline phosphatase & arterial blood gas analysis.
- Imaging studies included bone survey and abdominal ultrasound. Liver biopsy was performed to the most of cases to confirm pathological diagnosis. Molecular genetics was performed through contribution with Exeter genetics labs for all patients except one.

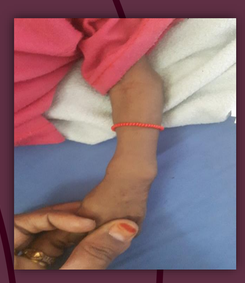
Results

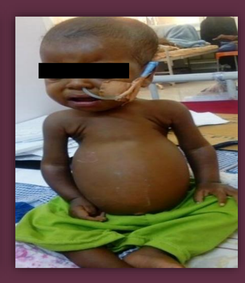
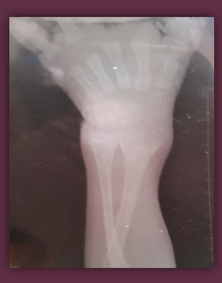
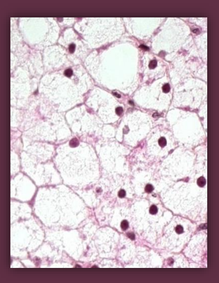
- Mean age of first symptom was 3.5 months, while mean age at diagnosis was 11months.
- Male: female ratio was 1:1.
- Polyuria was the first symptom to be noticed by the families in most of patients.
- Recurrent tachypnea and dehydration wrongly diagnosed as pneumonia or gastroenteritis were common at presentation and many siblings died undiagnosed with a similar clinical picture.
- Family history was significantly positive and consanguinity rate was high among affected families.
- All affected children presented in infancy with growth failure and features of rickets which were prominent on examination as well as abdominal distention and liver enlargement.
- Investigation confirmed presence of proximal renal tubular acidosis and hypophosphatemic rickets and most cases had fasting hypoglycemia and postprandial hyperglycemia.
- Clinical diagnosis for most cases were confirmed by liver biopsy, while molecular genetics confirmed presence of SLC2A2 mutation in others.
- Management is largely supportive and pointed towards rickets & acidosis. All patients showed good response after treatment.

Patients characteristics	P1	P2	P3	P4	P5	P6	P7	P8
Wt at presentation (Kg)	5.3 (-4SD)	4 (-10SD)	4 (3rd)	3 (-7SD)	4.2 (-6.8SD)	4.5 (-5SD)	8.4 (-5.5SD)	3.7 (-2.5SD)
Hgt at presentation (cm)	63 (-3.2SD)	58 (-7SD)	55.5 (3rd)	NA	NA	57 (-5SD)	72 (-5.7SD)	48 (-4SD)
Urine (glucose)	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
X ray features of rickets	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Ca (mg/dl)	9.3	10.4	10.1	12.7	9	9.2	10	8.4
Po4 (mg/dl)	1.5	2.3	2	2.7	2.3	2.5	1.8	2.8
Alp (U/L)	1297	1410	2510	1857	1380	498	446	1371
FBS (mg/dl)	43	NA	NA	46	60	92	37	84
RBG (mg/dl)	309	212	230	448	NA	NA	205	213
ABG Metabolic Acidosis	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
Liver biopsy	NA	+ve	NA	+ve	+ve	+ve	+ve	+ve
Genetics	SLC2A2 p.Arg53Ter (p.R53*)	NA	SLC2A2 p.Arg53X (p.R53X)	SLC2A2 p.(Arg53 Ter)	SLC2A2 p.(Tyr245Ter)	SLC2A2 p.Gly107Asp	Pending	Pending

Conclusion

- **This is the largest series from Sub-Saharan Africa.**
- We are adding more cases of Fanconi Bickel syndrome to the case which we published before to show that Fanconi Bickel syndrome is not uncommon in Sudan where there is a high consanguinity rate.
- Cases can be missed as the clinical picture at presentation can mimic some of the common local problems such as pneumonia or gastroenteritis.
- Increase awareness among pediatricians and easy accessibility to molecular genetics through help from international institutes have helped in diagnosing these cases.



Patient characteristics	P1	P2	P3	P4	P5	P6	P7	P8
Age at first presentation	5 m	7m	2m	2m	4m	4m	2m	2m
Age at diagnosis	10m	16m	2m	4m	11m	10m	3yr	2m
Sex	F	F	M	M	F	M	M	F
Consanguinity	Yes	Yes	Yes	Yes	No	Yes	No	No
Polyuria	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Respiratory distress	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Abdominal distention	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family history	+ve One sibling died	+ve One sibling died	+ve Two siblings died	+ve One sibling died	-ve	+ve One sibling died	+ve Two siblings died	+ve Two siblings died

References

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