

Case Study: The use of Renastart™ with a child with Chronic Kidney Disease (CKD) stage 5

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Patient Details & Medical History

Age:
21 months

Gender:



Diagnosis:
CKD stage 5 due to Fanconi syndrome.

The patient was diagnosed with Fanconi syndrome (a kidney tubule disorder) at birth and had a history of faltering growth.

He was admitted at the age of 21 months to start haemodialysis (HD) due to CKD stage 5 and ophthalmological deterioration. He was previously on conservative management for chronic kidney disease (CKD) at another centre. A gastrostomy feeding tube was already in place to manage persistent vomiting.

Relevant medications:

Medication	Reason for Use
Alpha-Leo 3 drops, 2/day D-cure 5 drops, 1/day	Vitamin D supplements
Ferricure 15 drops, 2/day	Iron supplement - to treat anaemia
NaCl 750mg	Sodium chloride supplement
Pyridoxine 110mg	B Vitamin supplement
Omeprazole 2.5ml, 2/day	Anti reflux medication
Aranesp 20µg, 1/day every 6 weeks (IV)	Iron injection to treat anaemia



Dietetic Assessment - before starting haemodialysis

Age	21 months
Weight (kg)	11.4
Height (cm)	82
Percentile on the growth chart	Weight: 10th centile Height: 25th centile

Biochemistry before starting HD:

K ⁺ (mmol/l)	PO ₄ (mmol/dl)	Urea (mg/dl)	Creatinine (mg/dl)	GFR (ml/min)
4.8 Ref Range* (3.6-4.8)	0.93 Ref Range* (3.1-7.4)	50 ↑ Ref Range* (3.1-7.4)	1.32 ↑ Ref Range* (3.1-7.4)	22

* Ref: Hospital reference range.

Nutritional requirements:

Energy: 78-82 kcal/kg/day¹ = 890-935 kcal/day

Protein: 1.4 g/kg/day¹ = 16 g/day

No other dietary restrictions

Dietary intake:

146 g semi-elemental infant feed + 70 g carbohydrate powder (maltodextrin) + 1250 ml water, continuous feed by gastrostomy at 66 ml/hour.

Providing:

Energy (kcal)	Protein (g)	K (mg)	P (mg)	Na (mg)
946 83 kcal/kg	16.94 1.5 g/kg	830 72 mg/kg	496 43.5 mg/kg	255 22.4 mg/kg

This feed was low in sodium (Na) therefore a 750 mg NaCl supplement was added to provide 295 mg additional sodium. The feed combined with the supplement provided 550 mg (48.2 mg/kg) sodium.

An extensively hydrolysed protein, lactose free formula was chosen by clinicians in the previous medical centre to manage extreme vomiting (not for the management of cow's milk allergy).

The feed described above was continued after HD commenced, despite frequent vomiting, as the patients serum potassium levels remained within the reference range. After two months on dialysis, the catheter blocked and a replacement was required. HD was not possible. Without regular dialysis the patient was at risk of hyperkalemia.



Aim and management plan

Dietary management:

When it was not possible for HD, a low potassium feed was required. Therefore the feed was changed to Renastart™. Due to the patient's history of vomiting and poor tolerance, the concentration of Renastart was reduced from 20% (standard dilution) to 12%. Biochemistry and growth were monitored carefully on this feed plan due to the reduction in dietary potassium and phosphate intake.



Assessment and feeding plan for period without HD

Age	2 years
Weight (kg)	11.41
Percentile on the growth chart	Weight: 10 th

Biochemistry before starting Renastart:

K ⁺ (mmol/l)	PO ₄ (mmol/dl)	Urea (mg/dl)	Creatinine (mg/dl)
4.9 Ref Range* (3.6-4.8)	1.73 Ref Range* (1-2)	18 Ref Range* (12-48)	1.38 ↑ Ref Range* (0.31-0.47)

* Ref: Hospital reference range.

Nutritional requirements:

Energy: 78-82 kcal/kg/day¹ = 890-935 kcal/day

Protein: 1.4 g/kg/day¹ = 16 g/day

Poor weight gain over the previous 2 months was noted. This may have been related to ongoing challenges with frequent vomiting and therefore nutritional losses. An increased energy feed was provided.

Feeding Plan:

Feed change to Renastart: 146 g Renastart + 70 g carbohydrate powder (maltodextrin) made up to 1250 ml water to provide 12% concentration. Delivered as continuous feed by gastrostomy at 66 ml/hour.

Providing:

Energy (kcal)	Protein (g)	K (mg)	P (mg)	Na (mg)
987 87kcal/kg	10.95 0.96g/kg	171 15mg/kg	134 11.7mg/kg	357 31mg/kg

Renastart was used for 4 days. The patient's potassium levels remained within the reference range. It was important to ensure regular monitoring of the patient's electrolyte levels due to the low intake of potassium from the feed.

Biochemistry while on Renastart:

K ⁺ (mmol/l)	PO ₄ (mmol/dl)	Urea (mg/dl)	Creatinine (mg/dl)
4.0 Ref Range* (3.6-4.8)	1.36 Ref Range* (1-2)	34 Ref Range* (12-48)	2.22 ↑ Ref Range* (0.31-0.47)

* Ref: Hospital reference range.

Intake of protein was below estimated requirements, however this amount was given safely for a short period without HD to keep potassium levels within a safe range and to manage symptoms of persistent vomiting.



Outcome

Four days later, the catheter was replaced and HD recommenced. The patient returned to his previous feed of 146 g semi-elemental infant feed + 70 g carbohydrate powder (maltodextrin) + 1250 ml water, delivered continuously.

On review 1 month later, his potassium level remained within the reference range and his weight increased to 11.7 kg (10th centile on growth chart).

The medical team agreed to continue this feed and monitor his tolerance and electrolyte levels regularly.

The patient went on to require a combination feed which included Renastart to manage raised serum potassium levels while awaiting a transplant.



Take Home Messages

- Renastart can be used to enable a low potassium intake to be achieved when serum potassium levels are raised. This can help to maintain patient safety during times when HD is not possible (for example if a catheter is blocked).
- It is important to monitor electrolyte levels and nutritional status regularly and adapt the feeding plan according to results.

Reference: 1. Royle J. Chapter 12: Kidney Disease. In: Shaw V, editor. Clinical Paediatric Dietetics. 4: John Wiley & Sons Ltd.; 2015. p. 242-81.

This information is intended for use by Healthcare Professionals only.

Renastart is a Food for Special Medical Purposes. Must be used under strict medical supervision with regular monitoring of nutritional status and electrolyte levels. For enteral use only. Not suitable as a sole source of nutrition.



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