Birmingham Women's and Children's NHS Foundation Trust

By your side

Morbidity associated with Primary Hyperoxaluria Type 1 (PH1) following liver transplantation: an aid for counselling of families

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INTRODUCTION

Primary Hyperoxaluria Type 1 (PH1) is a severe rare inherited metabolic disease resulting in renal failure and multisystem deposition of oxalate. The current curative management strategy adopted by our centre is enzyme replacement therapy by liver transplantation followed by renal transplant when the systemic oxalate load has reduced.

AIMS

This review is focussed on informing clinicians of the morbidities associated with systemic oxalosis following liver transplant with an aim to aid the counselling of families

METHODS

- Twenty-nine patients with PH1 type 1 were cared for in our centre between 1998 to 2021.
- 8 patients underwent a liver transplant followed by having or currently awaiting a sequential renal transplant.
- The patients' physical and electronic notes were reviewed and complications were identified by systematic enquiry.

Demographic information

- 7 male and 1 female patients were included in the review
- Average Age when Liver transplant performed: 3 years
- 3 Patients have received a renal transplant:
- Average Age when renal transplantation performed: 5.6 yr

RESULTS

Cardiovascular:

- Vasoplegia developed in the immediate post-transplant period in 2 patients. Both required prolonged inotropic support.
- One of these patients developed ischaemic bowel and hepatic artery thrombosis resulting in liver failure in the acute post-transplantation period requiring an urgent listing for a second liver transplant.
- Cardiovascular morbidity resulted in a delay of listing for renal transplantation in 2 patients.
- A third patient developed right-sided heart failure with diastolic dysfunction secondary to secondary to systemic oxalosis. They also had other systemic manifestations of oxalosis such as growth failure requiring parenteral nutrition (PN), recurrent infections, pancytopenia, and recurrent hypotension on dialysis, which subsequently resulted in palliation.

RESULTS

Gastrointestinal system: 3 patients reported recurrent abdominal pain with 2 patients undergoing upper GI endoscopy, which yielded no significant findings. Two patients developed intestinal failure with PN dependency and hypoalbuminemia. This led to long-term feed intolerance in one patient. Palliation was also considered in view of the significant multisystemic effects noted.

Metabolic disease: 2 siblings developed hyperammonemia following liver transplantation, one patient died due to complications of this. This is an unusual complication and is unlikely to have been reflective of the hyperoxalosis.

Eyes: 62.5% of patients had ophthalmology follow-up and had retinal oxalate deposition and pigmentation with no effect on visual acuity

Bones: 5 patients had more than one pathological fracture. Long bone fractures were the most common type of fractures with 80% of patients having more than 1 pathological long bone fracture.

Pancytopenia: Pancytopenia was also reported in 4 Patients with 75% of patients requiring bone marrow aspirates which showed no cellular dysplasia but increased bone remodeling

Figure 1: MULTISYSTEMIC IMPACT OF HYPEROXALOSIS

Teeth
Peridontal Disease

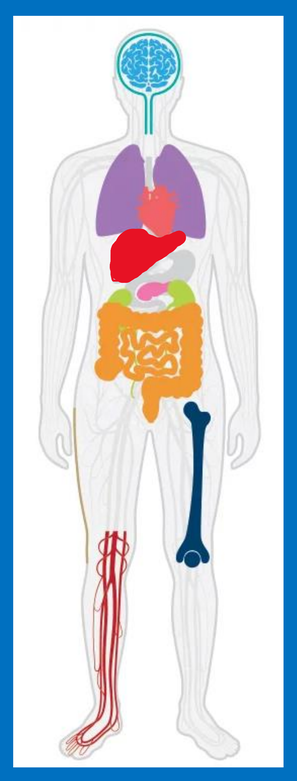
Respiratory
Pulmonary Hypertension

Kidneys
Nephrocalcinosis
Nephrolithiasis
End stage renal failure

Intestinal Deposition

Vascular
Vasculopathy
BP Dysregulation

Eyes
Retinopathy



Endocrine
Secondary hyperparathyroidism
Hypothyroidism

Cardiac
Cardiomyopathy,
Heart block and cardiac conduction defects

Bone
Oxalate Osteopathy
Bone and joint pain
Recurrent fractures

Bone Marrow
Pancytopenia

Conclusion

- PH1 is a rare and serious disease where sequential liver transplant followed by renal transplant is the current model of care,
- Despite enzyme replacement with liver transplant, systemic oxalate deposition often continues to cause serious morbidity.
- A clear understanding of the effects of systemic oxalosis following liver transplant is important to aid clinicians to give clear counselling and to manage expectations of patients and their carers in the immediate phase and in the short to medium term.

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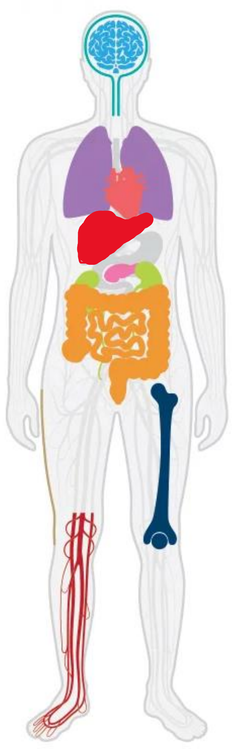

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OTHER DETAILS

- We reviewed records for 29 Patients diagnosed with primary hyperoxaluria type 1 (PH1) from 1998 to 2021.
- 10 patients had liver transplantation alone or sequential liver and kidney transplantation. (1 patient had preemptive liver transplantation and was excluded)
- Of the 9 patients with liver transplantation, 8 of these patients had their transplantation at out tertiary unit and were included in the audit.

Demographic Details

No of Patients – 8 Patients included

7 male and 1 female patient

Age at Liver Transplant: (1-9) Average 3

3 Patients have received a Renal Transplant

Average age of Liver Transplant: 5.66