

Pediatric PSC

A children's tale

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PSC Partners seeking a cure

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Incidence

- Primary Sclerosing Cholangitis (PSC) ; rare progressive cholestatic disease.
- In children the incidence rate is 0.23/100,000 compared with 1.11/100,000 in adults.
- Median age of diagnosis in adults is 41 yr vs. 11-12 yr in children.
- More prevalent in male 3;1 and in Caucasians

Genetics



- PSC was found in 0.5% (4-fold increased risk) among first-degree relatives of patients with PSC
- The occurrence of UC among first-degree relatives of patients with PSC was 0.9%

PSC and IBD

- 80% have IBD (UC and Crohn's colitis)
- 5% of IBD have PSC
- Either may precede
- No correlation between the severity of PSC and IBD
- More quiescent colitis and found on screening
- Annual surveillance colonoscopy for CA not required in children

Other associations

- Neonatal PSC
- Immunodeficiency
- Langerhans cell histiocytosis
- Cystic Fibrosis
- Overlap syndrome; Autoimmune hepatitis
- Other autoimmune disease, Autoimmune pancreatitis

Clinical Manifestations

- 20-40 % asymptomatic at presentation
- Itching
- Jaundice (less common than adults)
- Abdominal pain
- Fatigue and weight loss
- Bone loss
- Acute presentation is rare
- Fever and acute cholangitis 10% - 15%

Physical Exam

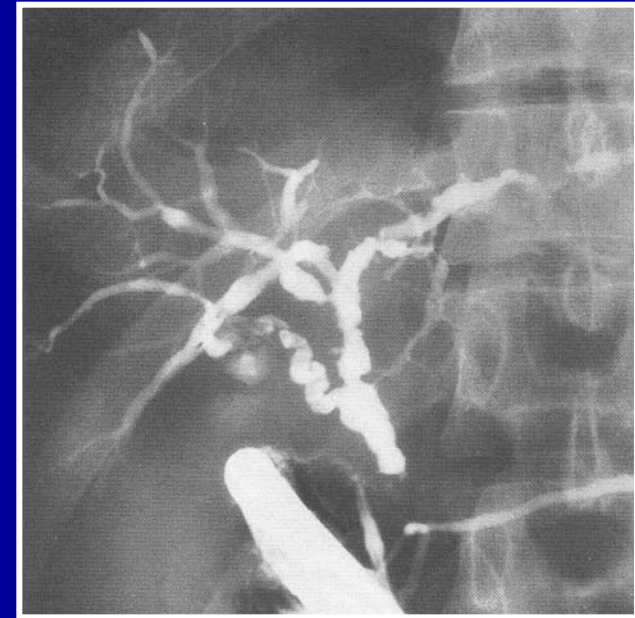
- Unremarkable in early stages.
- Hepatomegaly (45%)
- Splenomegaly (30%)
- Excoriations (20%)
- Ascites (1%)

Pediatric PSC

- Associated more with autoimmune features (25%-28%) vs. adult (6%).
- Alkaline phosphatase (ALP) has wide range due bone isoenzymes induced by growth.
- Gamma-glutamyl transpeptidase (GGT) more reliable index of biliary injury in children.

Imaging

- Dominant stricture of biliary tree less common in children
- ERCP and MRCP are both safe in children with equal performance
- MRCP provides imaging proximal to strictures and the extra-luminal abdomen.
- ERCP; intervention (stent balloon dilatation) , CC sampling



Natural course

- Median survival from diagnosis to OLT 9 -18y.
- Inter-individual variability in the rate of progression
- Asymptomatic patients have a significantly better prognosis, 17% present with small-duct PSC
- Prognosis in children may be somewhat better than that of adults, since dominant strictures, recurrent cholangitis and cholangiocarcinoma are uncommon.

Treatment

- No prospective, randomized controlled trials of therapy of PSC in children
- Recommendations are based on studies in adults and anecdotal findings from cases series in children

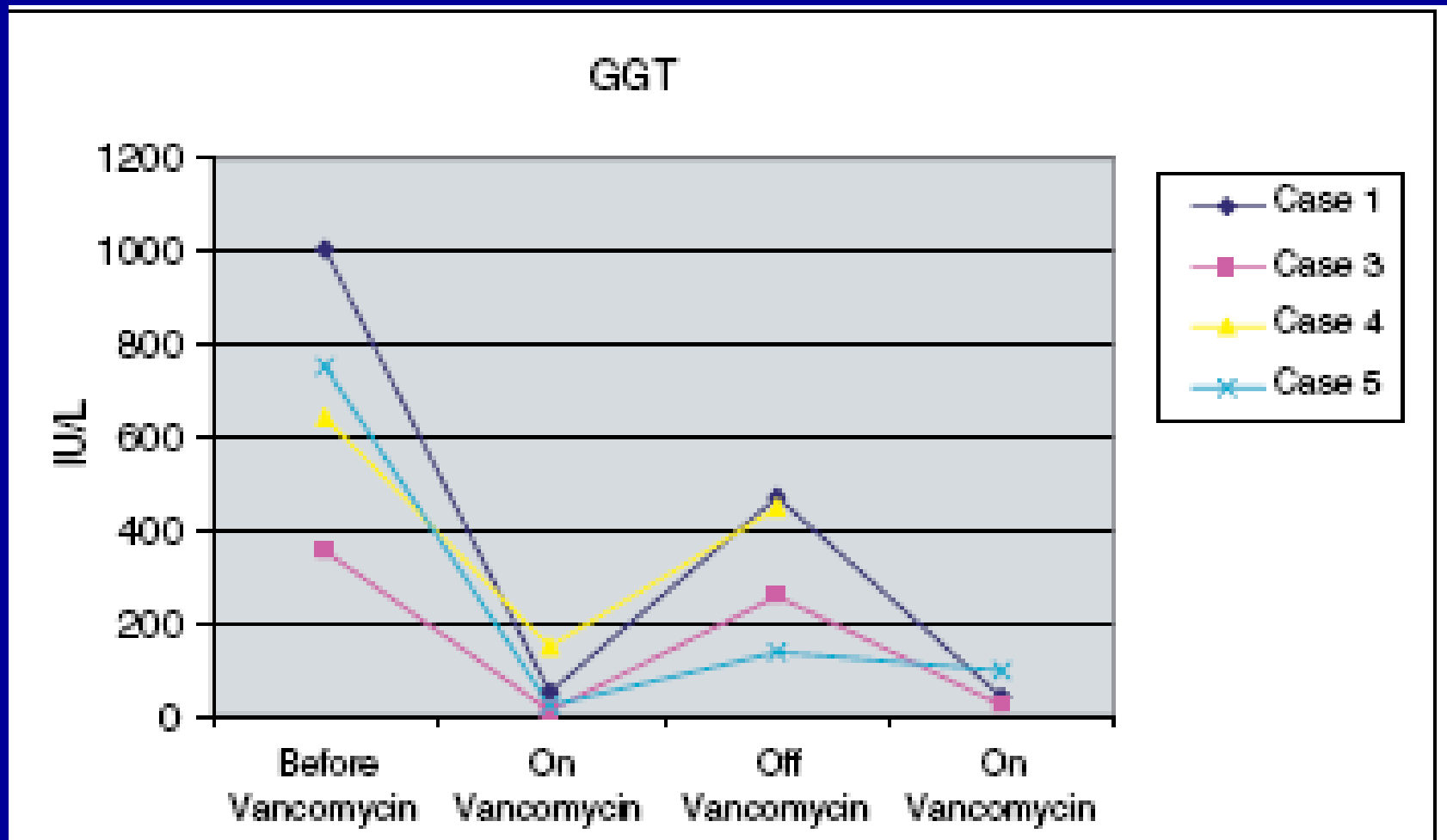
Ursodeoxycholic acid (UDCA),

- Biochemical improvement
- Decreased pruritus
- Lower risk of colon cancer
- May reduce cholangiocarcinoma incidence
- May need high doses
- No impact on progression or survival
- 13-15 vs. 25-30 mg/kg/day

Treatment- other

- Supportive; Nutritional Fat soluble vitamins , calcium
- Managing complications (dominant stricture, cholangitis, stones, osteoporosis)
- Pruritus; Cholestyramine, rifampin, naltrexone, serotonin
- Silymarin- improvement of LFT (pilot not RCT)
- Immunosuppressants in overlap

Oral Vancomycin



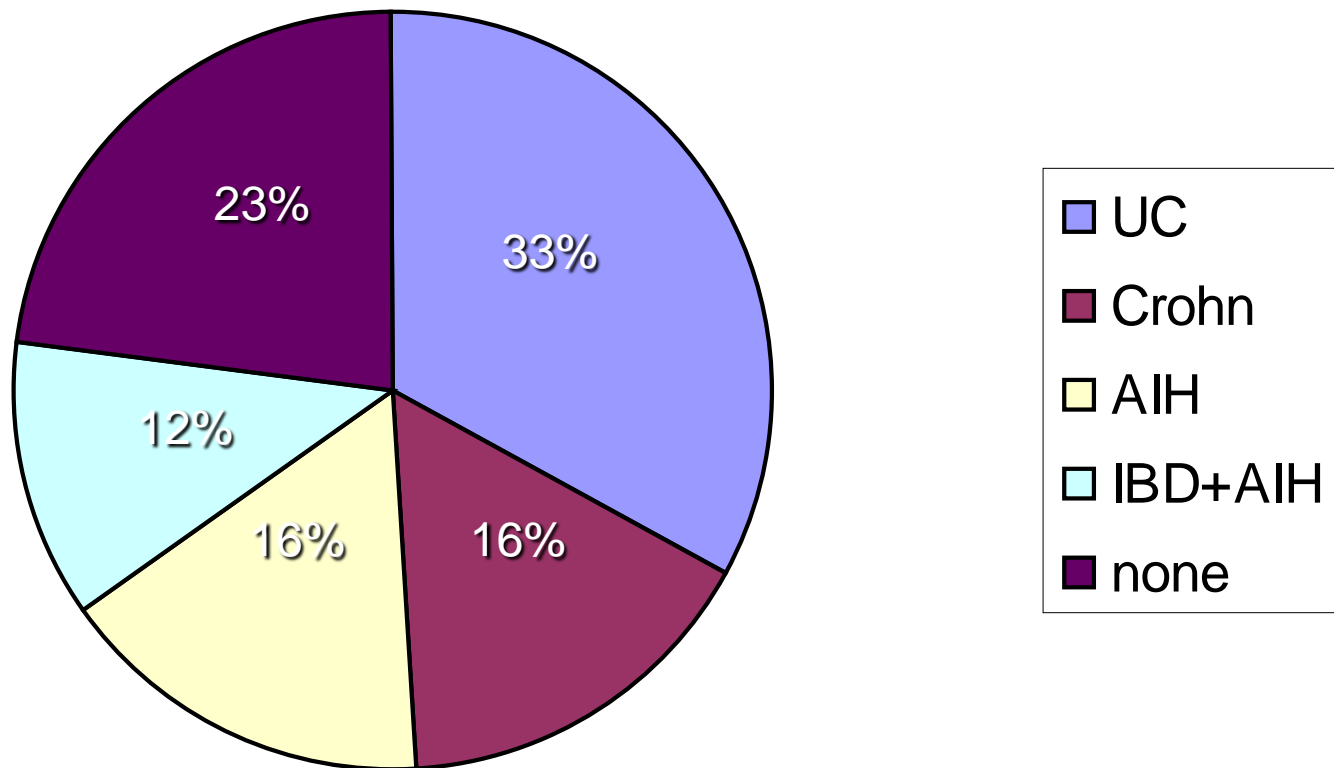
MSH experience

- **47 patients.**
- **Mean age at diagnosis 11 +/- 4.9 years**
- **62% male**
- **Most diagnosed based on liver biopsy and MRCP**



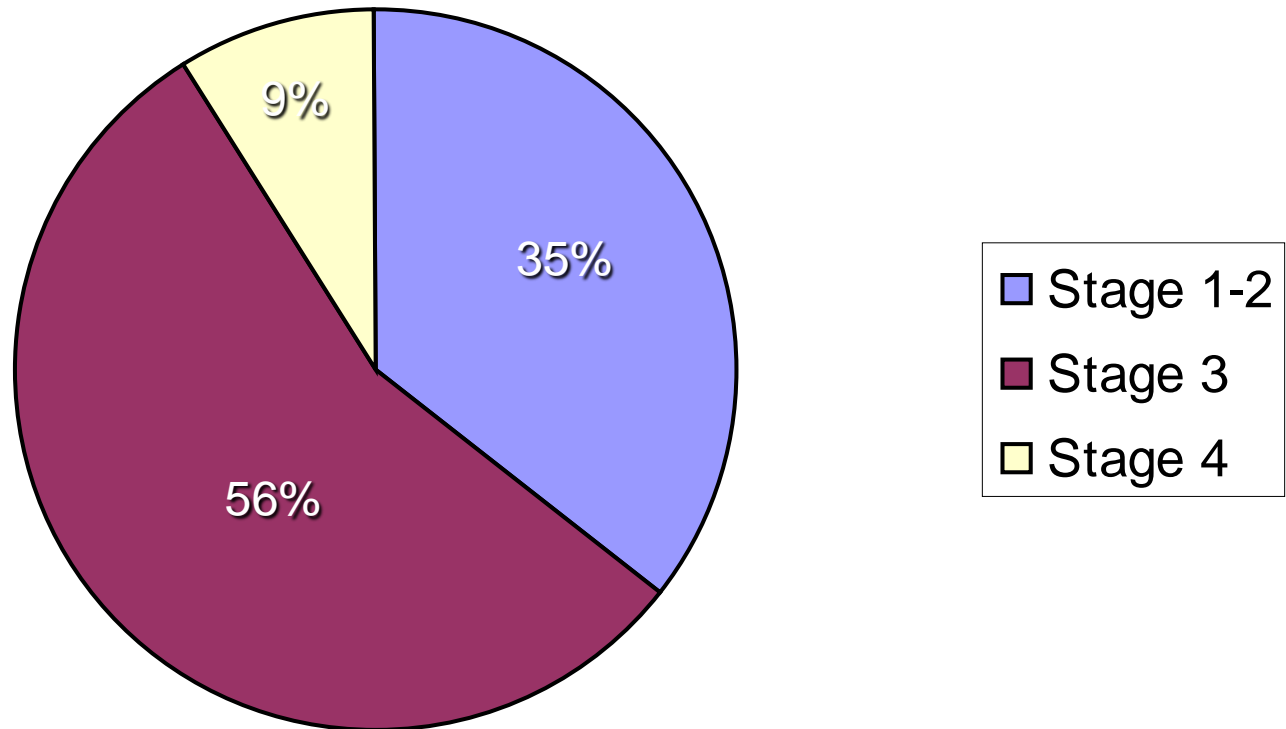
MSH experience 2

Co-morbidities



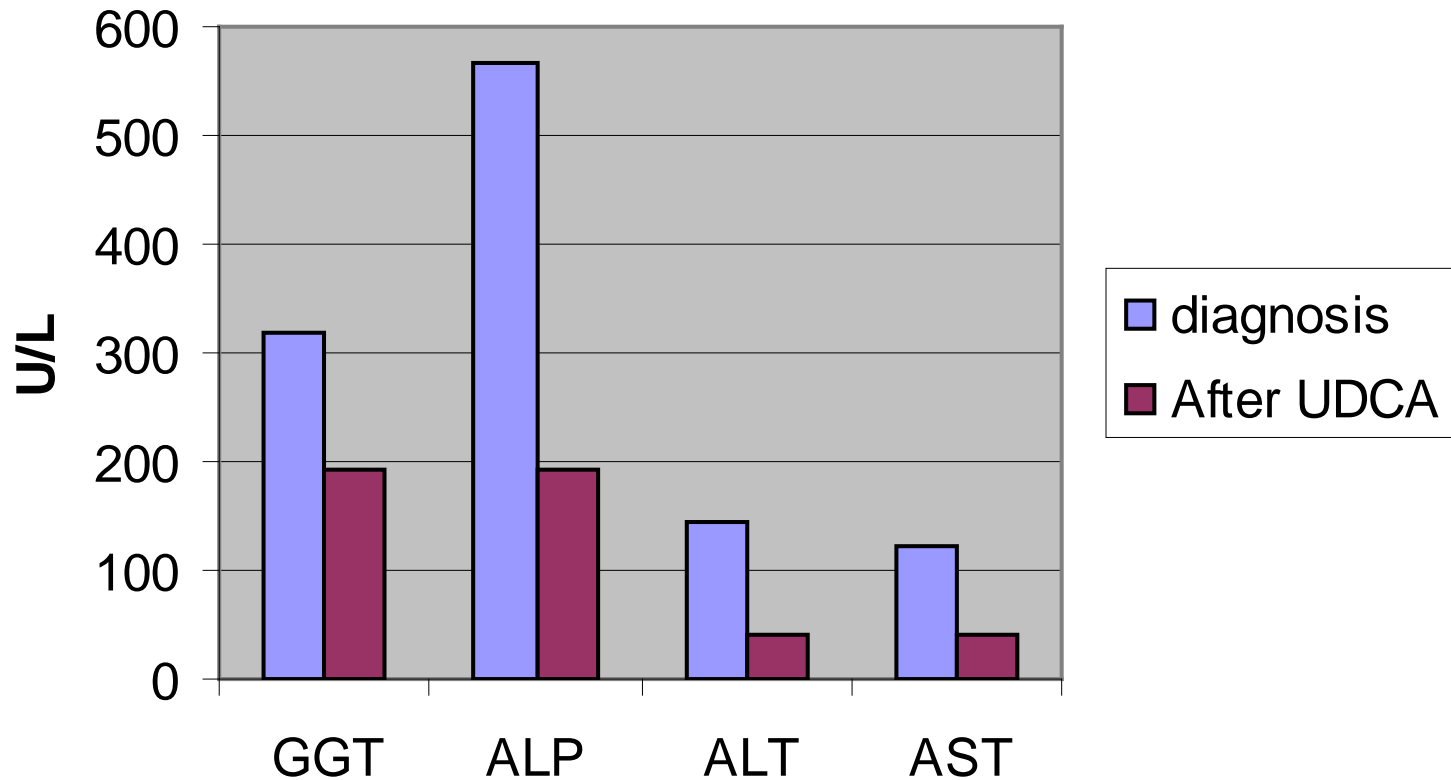
MSH experience 3

Fibrosis on liver biopsy



MSH experience 4

Laboratory findings



MSH experience 5

- **Liver transplantation** was performed in 8/47 (17%)
- 63% were female.
- Median time from diagnosis to liver transplantation : 7 years (range 4-19 years).
- 7/8 had fibrosis stage 3-4 on diagnosis.
- None had documented SC recurrence to date.

MSH experience 6

Most pediatric SC patients were:

- Symptomatic at diagnosis.
- Had either IBD, overlap, or both.
- IBD may be quiescent or develop after OLT.
- Liver enzymes improved on UDCA but effect on outcome remains unclear.