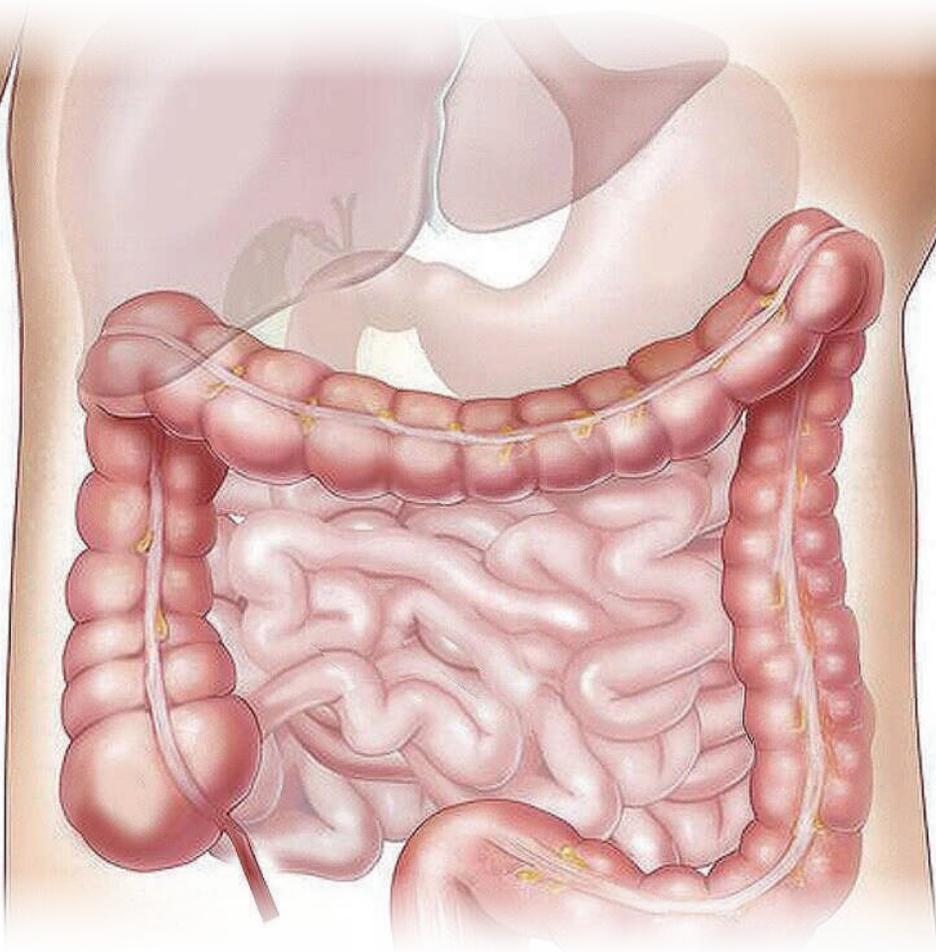


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** GERD : Gastroesophageal Reflux Disease

FROM THE EDITOR IN CHIEF

Welcome to the Eighth issue of PGLJ! With continued efforts of all contributors, reviewer and readers PGLJ is now slowly making a place for itself in the academic arena. We will continue to strive and work hard so that PGLJ becomes a resource that you can depend on to keep up with the rapidly evolving field of Pediatric Gastroenterology.

On February 10, 2021 ISPGHAN lost a stalwart in form of Prof B R Thapa, who was a pillar of Pediatric Gastroenterology in India. His contributions to the growth of the specialty are unparalleled. We at PGLJ believe that the best way to pay homage to Prof Thapa would be to imbibe his values and care for our patients, students and colleagues the way he did.

This issue brings an entire new feel to PGLJ with revised contents. We have changed our policy and now there will be "Clinical Synopsis" on topic of interest for pediatricians at large. We have also started a series on histopathology and radiology simplified. We continue with section of case reports; Journal Watch and Publications by ISPGHAN Members as previous issues. We would request all members to send us information about their publication so that we can continue to incorporate them in future issues. Hope you all will enjoy reading :-)

We request, you the readers to become an author and share your thoughts and research with the national and international community through this journal. We also request you to pass on the message to Trainees (DMs, FNBs, PDCCs, and Fellowships) for it will be a great place for them to start their academic venture. **Kindly submit your contribution in MS word only at: pglj.ispghan@gmail.com**

Dr Shrish Bhatnagar

Editor in Chief PGLJ 2020-21

Editors PGLJ 2020-21

Dr Rajeev Khanna, Dr Rishi Bolia, Dr Moinak Sen Sarma, Dr Rimjhim Shrivastava, Dr. Prasanth K.S

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OBITUARY: PROF BR THAPA



Feb 10, 2021: It was indeed a very sad day for all of us in the ISPGHAN fraternity. The passing of Dr. Thapa has touched and grieved the hearts of all, those who knew him well as well as those who were admirers at a distance.

Everyone has to die. It is an inevitable fact. It is only the details of how one lives and dies that distinguishes people from one another. The heartache everyone is going through stems from the fact that we all feel that Dr. Thapa has left the mortal world too early. He was just 68. However, from another perspective: don't you think, life is like a movie? It is the quality not the length that matters! Dr Thapa was born on March 13, 1953, did his medical schooling from Jammu Medical College and joined Paediatrics at PGI as a resident. He became a faculty in Paediatric Gastroenterology on 1st January, 1981, rose to the Head, Department of Paediatric Gastroenterology in 1998 and even served as Head of Gastroenterology from 2015 to 2018 before superannuating.

His contribution to the field of Paediatric Gastroenterology is immense and is hidden from none; We all have been witness to his enthusiastic participation in conferences as well as his numerous publications. But that is not what set him apart. It was his humility which was striking. So unassuming and mild was his demeanour.

His real strength was his patients. He had the rare quality of making an instant connect with them. The sense of service was ingrained in his blood. He would have arranged for the treatment of hundreds and thousands of patients using the resources of the elite known to him. He was a Radha Swami follower and implemented the teaching of the seat, to the letter, in his day to day life. More than 80% of our ward used to be poor free at any given time and he would manage to convince the administrators of the correctness of his policies.

Another facet was his eagerness to teach. He would literally have held the hands of hundreds of residents teaching them to feel that elusive spleen or discern a doughy abdomen from a normal one. He was rewarded by a remarkable fan following from amongst them. Their heartfelt posts upon his demise truly reflect their love for him. It is awe inspiring indeed. I salute him.

He remains a winner in life as well as after life!! It is not the years in your life but the life in your years that is important! And he lived a full life! As they say the song has ended but the melody lingers on.

I am sure he is happy and content wherever he is because I believe there is only one aim in life; to love and be loved: and he achieved that to the hilt. Life I believe is eternal and death is only a horizon. And a horizon is nothing but the limit of your vision.

He leaves a legacy for all of us to live by and to emulate. May he have eternal bliss. Let us celebrate his life by inculcating some of his inimitable qualities, his humility and his passion to serve!

Om Shanti.

Dr Sadhna B Lal

*On behalf of the Division of Paediatric Gastroenterology
PGIMER, Chandigarh*

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Management of Functional Constipation in Children

Moinak Sen Sarma

Functional constipation (FC) is a common problem in children and constitutes 90-95% of all causes of constipation in the pre-school years. Passage of stools with decreased frequency, harder consistency, difficult or painful evacuation, fecal soiling and associated anal fissures are the manifestations of the same. Retention (and/or withholding) maneuvers and presence of hard stools in per rectal (and/or palpable fecolith in abdomen) typically differentiate FC from Hirschprung's disease. Thorough clinical history and examination suffice the diagnosis. In a classical case of FC, abdominal X-ray, barium enema, colonic transit time, colonoscopy, anorectal manometry and rectal biopsy are not required and should be discouraged in routine practice. Presence of red flags (eg: anemia, gut obstruction, urinary issues, growth failure) should alarm for organic causes and warrant further workup. A four pronged therapy approach is required in FC.

1. **Counselling:** Care givers must be explained the disorder with a diagram, understand the natural history and adherence to therapy. They should identify and modify precipitating factors
2. **Diet:** Most children in India have constipation due to a milk predominant diet that lacks in fiber. Urban children have food faddism. Balanced diet rich in high fiber (vegetables, unpeeled fruits, whole pulses, legumes and bran) increased water intake and decreased milk intake should be encouraged and sustained even after medical therapy is completed
3. **Toilet training:** Toddlers should be trained by the "Rule of One": One person, one routine (5 min after every major meal), one word (eg pooh, potty), one toilet (Indian or Western with foot elevated rest). Reward system gives encouragement, ensures better compliance and avoids child-parent conflict
4. **Medical therapy:** This has two phases disimpaction and maintenance

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- A. **Disimpaction:** Presence of impacted stools in rectum, palpable fecolith or fecal soiling (overspill) of undergarments are indications of the same. Disimpaction is the process of flushing the gut with a laxative to clear the impacted stools. Drug of choice is polyethylene glycol (PEG) 3300-4000 (preferably with electrolytes). For home based disimpaction 1.5-2 g/ kg/ day PEG is given in two divided doses for 3-6 days (depending upon the clarity of rectal effluent). For hospital based disimpaction, 3-4 g/kg (25 ml/ kg/ hour) PEG is given orally or by nasogastric tube in young children. End point is clear rectal effluent. During this process, small children may require intravenous fluids to maintain hydration. Fluid overload should be avoided. SOS proctoclysis enemas are rarely required to relieve abdominal distention during disimpaction. Regular rectal enemas are overall discouraged due to possibility of inducing repeated mental trauma.
- B. **Maintenance therapy:** PEG (0.5-1 g/kg/day) >1 year age or lactulose (1-2 ml/kg/day) <1 year age is recommended for 3-6 months (to restore normal colonic tone) without any dose interruptions. Premature withdrawal leads to recurrence. Caregivers can titrate the dose that best suits their child with targets of daily 1-2 stools, soft and semi solid consistency. Follow-up visits are recommended at

D14, D30, D90 and D180 with vigilance over stool diary to understand the trend. Once normalcy is attained for at least 3-6 months, slow tapering is initiated over another 3-4 months with dose halving each month till complete withdrawal. Polytherapy and stimulant laxatives are not recommended as maintenance therapy.

Recurrence (10-15%), developmentally delayed and cerebral palsy children require where longer therapy (1-2 years from last episode of disimpaction). Rarely short episodes of acute constipation (5-10%) may require stimulant laxatives (bisacodyl, sodium picosulphate) as rescue therapy for 1-2 days. Refractory constipation despite optimal laxative dose and duration needs dedicated workup for organic causes.

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Management of Acute Pancreatitis

Pooja Semwal¹, Akhil Raj MS¹

Acute pancreatitis (AP) has an incidence of ~1/10,000 children per year and has been increasingly diagnosed in children in recent decades. A variety of etiologies including structural/anatomic, obstructive/ biliary, trauma, infections, toxins, systemic illness and genetic predispositions can result in AP.

Abdominal pain is the most common presenting feature followed by nausea, and vomiting. In infants/toddlers, symptoms may be subtle; therefore, the diagnosis requires a high level of suspicion.

The diagnosis of AP requires at least 2 of the following: (1) abdominal pain compatible with AP, (2) serum amylase and/or lipase values 3 times upper limits of normal, (3) imaging findings consistent with AP. The initial imaging modality of choice is an ultrasonogram. However, in cases where the diagnosis is uncertain a contrast enhanced CT (CECT) may be required to confirm AP and assess for local complications. If a CECT is required it should be delayed by at least 96 hours after symptom onset as early imaging may underestimate extent of disease.

On the basis of severity, AP is classified into mild (no organ dysfunction or complications), moderately severe (transient < 48 hours organ dysfunction or local/systemic complications) and severe AP (persistent organ failure > 48 hrs). Organ dysfunction includes cardiovascular, renal or respiratory dysfunction. A local complication includes pancreatic fluid collections or necrosis and systemic complication implies the exacerbation of a previously diagnosed co-morbid disease.

A focussed history should be taken to find out the etiology of AP. If there is no history of trauma, drug intake, infection or a systemic illness and there is no clue on imaging (gall stones, choledochal cyst etc) liver function test, triglycerides, and calcium level should be ordered. Genetic testing and more detailed imaging is reserved for cases of recurrent AP.

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The cornerstone of management of AP is fluid resuscitation, analgesia and monitoring for complications. Fluid resuscitation maintains adequate fluid status and prevents potential complications such as necrosis and organ failure. If there is evidence of hemodynamic compromise at presentation a bolus of 10-20 mL/kg is recommended. Thereafter, crystalloids (Ringers Lactate preferred over Normal Saline) should be given at 1.5-2 times the maintenance during the initial 24-48 hours. Adequate urine output (> 0.5-1 ml/kg/hour) is a marker of adequate fluid resuscitation. During this period the cardiovascular, respiratory and renal status should be closely monitored (at least every 4 hours).

Control of pain is an important therapeutic goal in the management of AP. NSAIDs/acetaminophens are the first line drugs. IV morphine/other opioids should be used if the pain is not responding to acetaminophen/NSAIDs

Contrary to popular belief, enteral nutrition (EN) should commenced as soon as feasible. Early enteral feeds (within 48-72 hours) with no specific diet restriction reduces length of hospital stay and risk of organ dysfunction. Nasogastric (NG) tube feeding can be considered for the patients not

taking orally. Nasojejun tube feeding is indicated only for the patients who are unable to tolerate oral/NG feeding. Parenteral nutrition should be considered in cases where EN is not possible for a prolonged period (longer than 5-7 days) such as in ileus or abdominal compartment syndrome.

There is no role for prophylactic antibiotics, probiotics, antioxidants and proton pump inhibitors. Fever is generally a part of a systemic inflammatory response syndrome and does not indicate an infection. Antibiotics are indicated only for documented infected necrosis (presence of gas within collections on imaging) or in patients with necrotizing pancreatitis not improving clinically without antibiotic use. The antibiotic of choice in such a situation is carbapenems, quinolones or metronidazole as they penetrate necrotic tissue.

Fortunately, majority of AP is mild and resolves in 3-4 days. Children need to be followed during their course of AP for complications including organ dysfunction & acute fluid collections and subsequently (>4weeks) for pseudocyst or walled-off necrosis (WON).

Severe AP, traumatic pancreatitis, cholangitis with pancreatitis and symptomatic pseudocyst or WON needs immediate

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referral to a specialist. ERCP is indicated in management of biliary AP related to choledocholithiasis and for pancreatic duct pathologies such as ductal stones or leaks. For the management of acute necrotic collections, interventions should be avoided and delayed, even for infected necrosis, as outcomes are superior with delayed (>4 weeks) approach. Where drainage is necessary, non-surgical approaches including endoscopic or percutaneous methods are preferable over open drainage. Cholecystectomy can be safely performed before discharge in cases of mild uncomplicated acute biliary pancreatitis.

Prognosis of AP in children is good with low rate of mortality. Recurrence (15-35%) is reported, therefore periodic close follow up of all the patients should be carried out.

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Coronavirus disease -19 Presenting As Acute Liver Failure In A Child

Sakshi Karkra¹, Yogesh Khurana¹, Rajiv Chhabra¹,
Prabhat Maheshwari¹

Coronavirus disease 2019(COVID-19) caused by Severe Acute Respiratory Syndrome Corona Virus 2(SARS CoV2) is the biggest global health crisis today. It mainly affects respiratory system though can also cause gastrointestinal and liver dysfunction and rarely affects other systems^{1,2}. While multiple studies on liver dysfunction associated with COVID-19 are available in adults there is limited data on its effects in children³. Furthermore, liver dysfunction associated with SARS CoV2 infection presents a management dilemma. As per our literature search there is no case reported of COVID-19 infection presenting with acute liver failure (ALF) in the pediatric population. We present the case of a 21 months old toddler with COVID-19 infection presenting with ALF who was successfully managed with COVID convalescent plasma along with other supportive therapies.

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CASE REPORT

A 21 months old female presented to the emergency room with history of moderate grade, continuous fever for seven days, vomiting and loose stools, 5-6 per day for four days along with excessive drowsiness. There was no significant past and family history. On examination, the child was hemodynamically stable, febrile, drowsy, icteric and was having intermittent extensor posturing. Her random blood sugar was 28mg/dl, so immediate 10% Dextrose was given @5ml/Kg following which the blood glucose normalised. Her weight and height were on 50th centile (z score 0 to -1) as per World Health Organization (WHO) growth charts. On systemic examination, there was hepatomegaly with mild abdominal distension and no clinical ascites. Her neurological examination revealed brisk deep tendon reflexes and bilaterally equal and sluggishly reactive pupils. Initial reports showed low hemoglobin, leucocytosis with low normal platelet count, international normalized ratio (INR) of 12.28, aspartate aminotransferase (AST) 1308 International Unit/Litre(IU/L), alanine aminotransferase (ALT) 686 IU/L, alkaline phosphatase (ALP) 101 IU/L and gamma glutamyl transferase (GGT) 77 IU/L, total serum bilirubin(TSB) 6.2 milligram/decilitre(mg/dl), albumin 2.3gram/dl. Her ammonia was 66 micromole/L, inflammatory markers were high with normal C Reactive Protein (CRP), triglyceride and renal functions. Complete workup for etiological diagnosis of acute hepatic failure was sent (*serial reports in Table 1*). Real time Reverse Transcriptase (RT) PCR for SARS CoV 2 (ICMR approved) was sent in view of persistent fever which came positive. Her

Hepatitis A, E, Ebstein Barr virus IgM and Antinuclear antibody came negative. Blood and urine cultures were negative.

The child was intubated for poor Glasgow Coma Score and an urgent computerized tomography (CT) Scan head was done which revealed no gross abnormality, while CT chest showed Covid-19 Reporting and Data System (CO-RADS) 5 changes in both lungs which favoured diagnosis of acute COVID-19 infection. (**Figure 1**). Her echocardiography was normal.

She was started on Meropenem along with dexamethasone @0.6mg/kg/day as per unit COVID protocol. Due to significant coagulopathy, patient was given intravenous (IV) vitamin K(10mg) and started on N - acetyl cysteine infusion @ 100mg/Kg/day, 3% sodium chloride infusion as per ALF and suspected raised Intra cranial tension(ICT) management protocol. In view of severe COVID-19 infection with ALF in our patient and very limited safe treatment options available for this age group, IV immunoglobulin @2gm/Kg was given empirically along with COVID-19 convalescent plasma twice after due consent from parents. There was a serial improvement in INR, transaminases and bilirubin. (**Figure 2a&2b**).

The child was extubated on day 3 of admission. The respiratory status of the child remained stable throughout the admission. Despite improvement in sensorium, the child had persistent fever and multiple repeat COVID-19 PCR were positive over the next 21 days. However, no seizure or hypoglycemia was observed after hospitalization. The child was discharged after 24 days in a hemodynamically stable state with a negative COVID PCR report.

Table 1: Laboratory values of the patient during hospital stay

Lab test / Day	1	2	4	8	14	21
Hemoglobin (Gm/ dl)	8.6	6.3	9.7	10.7	10.8	
Platelet (x10 ⁹)	133	75	157	100	695	
Total Leucocyte (x10 ⁹)	13.3	9.4	19.9	23	17	
Neutrophil/Lymphocyte(%)	72/18(3.8)					
CRP (mg/dl)	1.1		0.7	1.2	1.3	
Ferritin (ng/ml)	6999.7		257			
Lactate dehydrogenase(U/L)	1567		403		224	
PT (Seconds)	138.6	41.4	25.2			
INR	12.28	3.71	2.27	1.8	1.4	1.1
AST(IU/L)	1308	3637.4	948.4	77	42	32
ALT(IU/L)	686.9	3765.8	2766	631.4	167	44
GGT(IU/L)	77.3	67.8	81	100.6	90.8	75
ALP(IU/L)	101					
TSB (mg/dl) (Direct)	6.2 (3.1)	4.1 (1.6)	4 (1.5)	1.1(0.3)	0.7 (0.2)	0.5
T Protein (Gm/ dl)	3.9	7.6	6.9	7.3	7.9	
Albumin (Gm/ dl)	2.3	2.6	2.6	3.5	3.9	4.1
S Ammonia (Umol/L)	66					
D Dimer (ng/ml)	10340					

INR International normalized ratio, PT Prothrombin time, AST Aspartate amino transferase, ALT Alanine amino transferase, ALP Alkaline phosphatase, GGT Gamma glutamyl transferase TSB Total serum bilirubin



Figure 1a: X ray Chest (PA view)



Figure 1b: CT Chest

DISCUSSION

SARS CoV2 infected children have a milder disease course and a better prognosis than adults due to their special immune response system. Liver injury may result from direct pathogenic effect by the virus; systemic inflammation or; by drug toxicity. The angiotensin converting enzyme 2(ACE2) receptor, a postulated mode of entry of the virus, is expressed by 2.6% of hepatocytes and 59.7% of cholangiocytes.^{4,5} The association of severity of COVID-19 with underlying chronic

liver disease or other liver diseases has been studied in adults with limited data.⁶

Several studies on adult COVID-19 patients show incidence range of elevated ALT, AST 2.5%-50.0% to 2.5%- 61.1% respectively, increased TSB in 0%-35.3% with no significant elevations of ALP and GGT levels in most except in NAFLD patients who showed elevated GGT predicting a more severe course.^{6,7}Our patient had raised AST, ALT, TSB with normal GGT and ALP. Different studies show conflicting results to suggest significance of these abnormal liver enzymes. In a

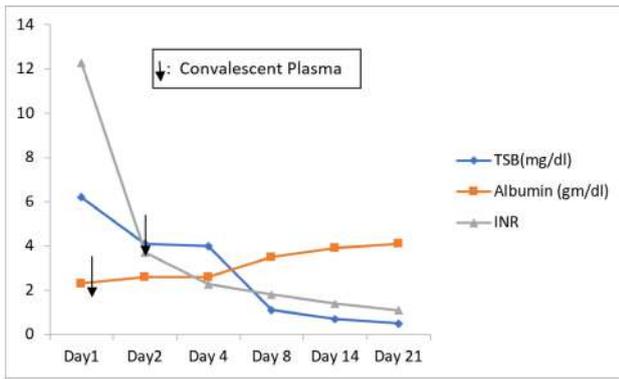


Figure 2a: Total serum bilirubin (TSB), Albumin and INR during course of illness

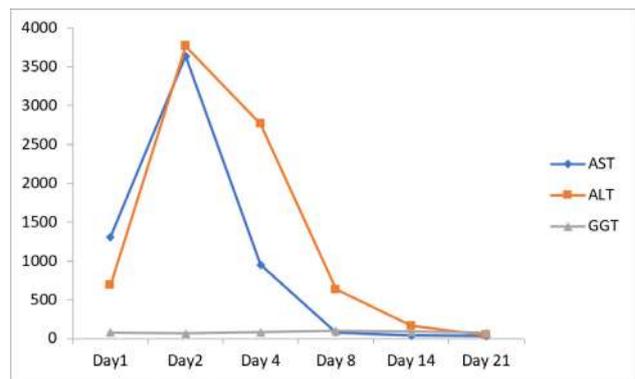


Figure 2b: Liver enzymes during the course of illness

Table 2: Various studies showing deranged liver enzymes

Study	N(COVID 19 positive) NS: Non severe S: Severe	Median age (yr)	Abnormal AST	Abnormal ALT	Comments
Guan et al ¹	1099 NS: 615 S: 142	47	18.2% 39.4%	19.8% 28.1%	
Huang et al ¹	41 NS: 25 S: 13	49(41-58)	25% 62%	- -	
Yang et al ⁸	710 S: 52	59.7(SD 13)	29%		No difference between survivors and non survivors
Phipps et al ²	2273	65		Mild : 45% Moderate : 22% Severe : 6.4%	Mild (<2X ULN) Mod : 2-5X ULN Severe: >5X ULN
Wang et al⁶	31	7.1(0.5-17 yr)		Mild: 22%	
Qiu et al⁵	36	8.3(0-16yr)		Mild : 5.5%	
Zhu et al⁷	10	Neonates		Mild:20%	Mothers COVID 19 positive
Our Patient	1	1.9yr		Severe	ALF

large cohort of 1099 patients, Guan et al⁸ observed elevated AST, ALT in 18.2% and 19.8% with non severe disease while 39.4% and 28.1% with severe disease. Similarly, Huang et al⁹ reported higher proportion of liver injury in intensive care unit (ICU) patients (61% vs 25.0%). On the contrary, Wu et al and Wang et al¹⁰ showed no significant differences. Severe acute liver injury due to COVID-19 has been described in adults rarely^{11,12} but no case has been reported in children. Similar prevalence of raised liver enzymes has been reported from the US²; INR was normal to slightly deranged in most; low serum albumin was observed in severe disease. Our patient had high neutrophil to lymphocyte ratio of 3.8 and low serum albumin which are considered as predictors of severe disease in adults, though same have not been studied in children. Three studies on 36, 31 and 10 children and neonates with laboratory confirmed COVID-19 from different provinces in China showed minimal increase in liver enzymes in two, seven and two cases with normal final outcome^{13,14,15} Results from different studies have been tabulated in **Table 2**.

Since COVID-19 in children is associated with minimal or no increase in ALT and AST levels, American Association for the Study of Liver Diseases (AASLD) suggests evaluating all children with abnormal liver enzymes for underlying liver diseases as they might be at a greater risk for severe disease¹⁷.

Our patient presented with diarrhea and ALF with no underlying liver disease. The hepatic involvement appears more of parenchymal type in our patient in view of very high AST, ALT, normal GGT, ALP, raised LDH, severely deranged INR and cholestasis. Though raised D dimer and ferritin can be secondary to ALF, cytokine storm or HLH secondary to COVID -19 infection contributing to the severity of illness cannot be totally refuted however in view of short history, persistent positive COVID PCR at 21 days, and no significant involvement of any other system, we attribute this as a manifestation of acute COVID infection. The abnormal movements at admission could be attributed to hypoglycemia secondary to severe liver disease as CT brain and ammonia was normal and sensorium showed good response within 48 hours. Whether the prolonged COVID PCR positivity and

ALF have any association, or whether severe parenchymal injury is secondary to more expression of ACE2 receptors in hepatocytes of these patients needs to be proved with larger cohort from other centers. Our case is important as this is the first reported pediatric case in world with acute COVID-19 infection presenting either primarily as ALF or secondary to HLH and responding to conservative management and convalescent plasma therapy with no adverse effects. Further studies are needed to understand the exact pathophysiology of ALF in acute COVID-19 infection.

CONCLUSION

Deranged liver enzymes can be seen in children with COVID-19 infection but are usually mild and do correlate with other markers of inflammation. ALF can be a rare manifestation in children and responds well to conservative management and convalescent COVID plasma therapy.

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Clinical profile of Hereditary Fructose Intolerance in children

Dr. Lalit Bharadia

Hereditary fructose intolerance (HFI) is a potentially fatal inborn error of metabolism (IEM) unless detected in time and treated with dietary modification. HFI often has nonspecific symptoms and the literature on clinical features is scanty. We collated information of our patients diagnosed as HFI and analyzed their clinical and laboratory features.

9 cases of HFI were diagnosed during the period from Jan 2012 to Dec 2020. The age at diagnosis ranged from 10 months to 30 months, median 18 months. The presentation was vomiting in 7 (77%) (acute in 1, recurrent in 6), abdominal distension (hepatomegaly) in 4 (44%), recurrent diarrhea in 3 (33%) and Failure to thrive in 3 (33%). The child with acute presentation had severe metabolic acidosis and hypoglycemia. 2 (22%) children diagnosed before 12 months of age presented with hepatomegaly and sugar aversion in one each and had a previous sib affected leading to earlier diagnosis. Diet history showed strong aversion to sugar in 3 while definite dislike for sugar in 5. LFT was abnormal in 8 (88%) patients in the form of raised transaminases 3-10 times upper limit of normal. Ultrasound abdomen showed fatty liver in 5 (55%) patients. Seven children had a confirmed genetic mutation on *ALDOB* gene apart from suggestive laboratory abnormalities while the first two cases were diagnosed on the basis of oral fructose challenge test. The most common mutation noted was on exon 5, c.472 C > T (all homozygous) in 5 and on exon 3, c.178 C > T (both homozygous) in 2 children. One patient has succumbed to a vomiting and seizure at home possible due to hypoglycemia, the diagnosis was confirmed postmortem upon mutation report. Rests of the 8 children are doing fine on a fructose free diet.

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Prevalence of HFI has ranged from 1 in 20,000 to 1 in 60,000 (1). Severe forms generally present in the infancy when exposed to fructose containing diet either in the form of acute vomiting, hypoglycemia, acidosis (2) and in the chronic form as failure to thrive and hepatomegaly. If recognized and treated they have a normal life expectancy. Children develop an aversion for sweets and fruits which can lead to a suspicion of HFI.

On pubmed search on HFI clinical features, isolated case reports have variable presentation as acute liver failure in neonates (3), isolated hepatomegaly (4), Reye like syndrome (5), or refractory Celiac disease (6). Interestingly minor form of HFI learns to modify their diet and may remain undetected in childhood. Thus it is very important to take history of dislike to sweet or strong aversion to sugar which can be a strong clue towards the diagnosis (7). Unless this is suspected and treated, children tend to worsen as sugar (Sucrose) is present in all forms of medicine which comes in suspension form. Also sugar, honey, juices, fruits are very commonly used in children which can be harmful in HFI. Many ready to eat complementary food and some of the infant milk formulas also contains sucrose which needs to be carefully avoided in these children. The mutations noted in our patients were different from the one reported from another study from north India (8). The HFI is likely under diagnosed and should be

considered in patients with above features as well as in individuals with significant aversion to sweets.

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The Normal Liver Histology (Part 1)

Dr Mukul Vij MD, PDCC

HISTOPATHOLOGY SIMPLIFIED:

This six part series will give simple tips on diagnosis of common liver histopathology for post graduate students. This will comprise of

1. Normal liver histopathology
2. Biliary atresia, Allagile syndrome
3. Giant cell hepatitis, PFIC
4. wilson, Autoimmune
5. Rejection, Acute, chronic
6. hepatoblastoma

THE NORMAL LIVER HISTOLOGY

Under a microscope normal liver have a regular structure based on portal tracts and terminal hepatic veins. The portal tracts contain multiple structures including hepatic artery, portal vein and interlobular bile duct(Figure 1). All these are embedded in connective tissue. Few lymphocytes can also be seen in portal tracts. Small bile ducts are lined by cuboidal epithelium and have a basement membrane. The artery has an inner intimal layer lined with endothelium and a muscular wall. The portal vein has an endothelial lining with a basement membrane and scanty adventitial fibrous connective tissue. The individual hepatocyte is polygonal in shape with eosinophilic cytoplasm. The nucleus is centrally placed, and one or more nucleoli are easily identified. The liver has a lobular architecture.

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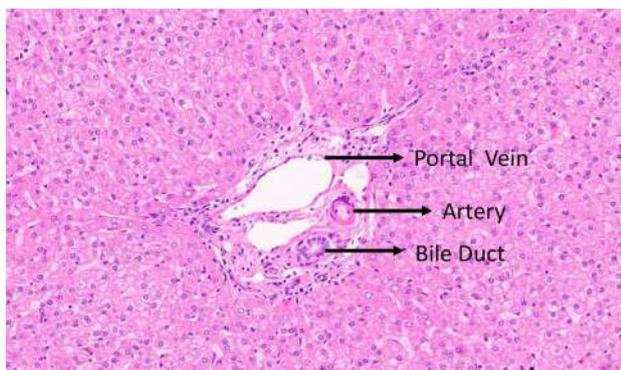


Figure1 : Portal tract displaying portal vein, hepatic artery and bile duct

Portal Vein: endothelial lining with a basement membrane and scanty adventitial fibrous connective tissue.

Hepatic artery: The artery easily identified with an inner intimal layer lined with endothelium and a thick muscular wall.

Bile duct: Small bile ducts are lined by cuboidal epithelium and have a basement membrane.

A lobule is a hexagonal structure containing a terminal hepatic venule (central vein) at its centre with plates of hepatocytes radiating centrifugally towards portal tracts at the periphery (figure 2). The lobule is divided into three regions: a pericentral region around the central vein, a periportal region around the portal tract, and a mid-lobular region situated in between.

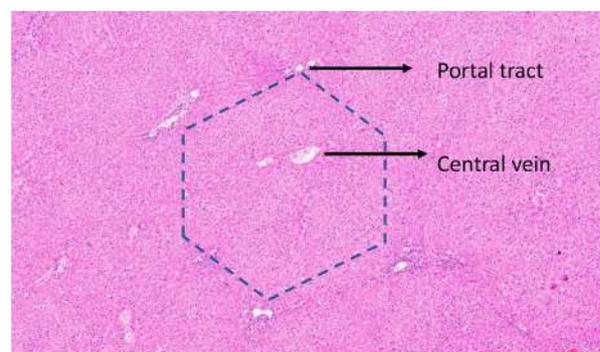


Figure 2: Hepatic lobule with hepatic venule at the centre and peripheral portal tracts. An imaginary hexagon has been drawn connecting portal tracts with central vein.

SPECIAL STAINS

Masson trichrome

Most common special stain applied to liver specimens. Imparts a blue color to collagen against a red background of hepatocytes and other structures (Figure 3). It stains type 1 collagen that is normally present in the portal tracts and vessel walls. It is used for staging of chronic liver diseases

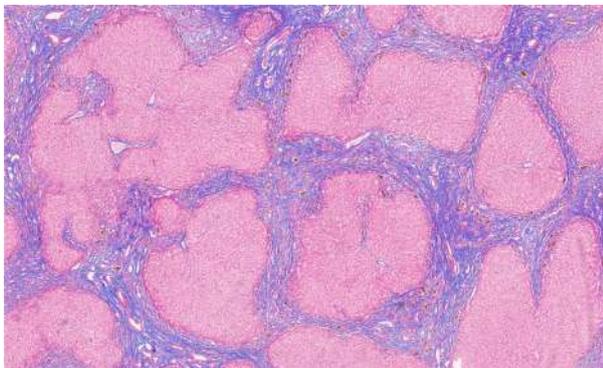


Figure 3: Masson trichrome stain showing collagen (blue) running from portal to portal tract indicating bridging fibrosis

Reticulin Stain

Uses silver impregnation to detect reticulin fibers, which are made of type 3 collagen. The fibers appear black against a gray to light pink background (figure 4). In the liver, such fibers are present as part of the extracellular matrix in the space of Disse. Helps in the assessment of the architecture of the hepatic plates, such as expansion in regenerative and neoplastic conditions, compression of plates in nodular regenerative hyperplasia, and collapse of the reticulin framework in necrosis

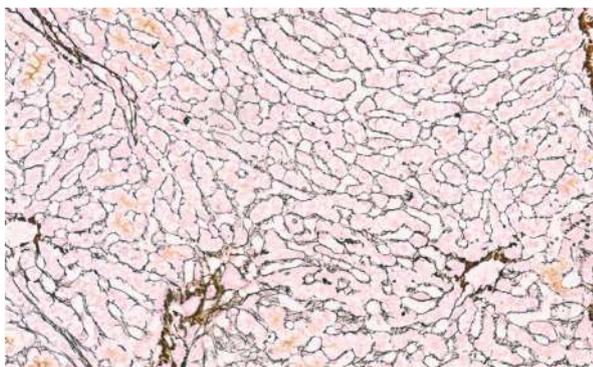


Figure 4: Reticulin Stain

Perl's Iron Stain

The Perl's iron stain (Prussian blue reaction) is a stain for detecting iron. Iron is stored in the hepatocytes as a soluble form (ferritin) and an insoluble form (hemosiderin). With the H&E stain, hemosiderin is seen as coarsely granular brown refractile granules in the cytoplasm, whereas ferritin is not seen. Pearl's stain highlights hemosiderin as coarse blue granules, while ferritin is seen as a faint blue cytoplasmic blush (figure 5)

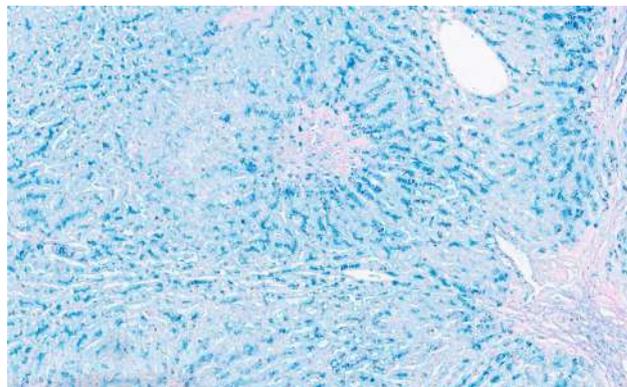


Figure 5: Perl's Iron Stain

Rhodanine stain

Rhodanine stain is an excellent stain to detect copper. Copper is excreted in bile and accumulates in the liver in chronic biliary diseases. Staining for **copper** is also used in suspected Wilson's disease. Copper deposits appears as brick red while nuclei appears pale blue (figure 6)

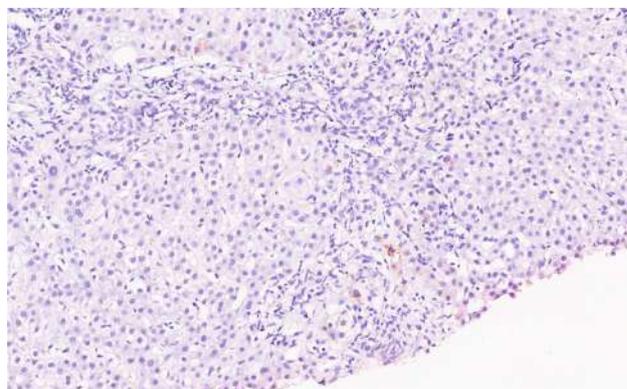


Figure 6: Rhodamine stain, Copper deposits appears as brick red

1. Rediscovering histology: what is new in endoscopy for inflammatory bowel disease?

Solitano V, D'Amico F, Allocca M, et al. Rediscovering histology: what is new in endoscopy for inflammatory bowel disease?. *Therap Adv Gastroenterol.* 2021;14:17562848211005692. Published 2021 Apr 16. doi:10.1177/17562848211005692

Mucosal healing (MH) as well as histological remission (HR) along with symptomatic relief are considered as an ideal target in the successful management of inflammatory bowel disease (IBD). The recommended high definition white-light endoscopy (HD-WLE) is not able to identify residual inflammatory activity more so in Crohn's disease (CD) where transmural layers are involved. Many new endoscopic technologies for the assessment of mucosal inflammation have come to rescue. This review focuses on the new endoscopic techniques and devices and their role in disease assessment.

Dye-chromoendoscopy: The endoscopic assessment of disease extent by this procedure is significantly correlated with that of histological data. This procedure involves usage of staining agents as methylene blue and indigo carmine which are applied to the mucosa for assessment of the mucosal surface.

Dye-less chromoendoscopy: These are different modalities incorporated by different manufacturers of endoscopes using optical light. This aids in better visualisation of mucosal vascular pattern and morphology. Narrow band Imaging (NBI) (Olympus, Japan) uses optic filter which reduces the light spectrum from the endoscope which then gets absorbed by the hemoglobin projecting an enhanced image of mucosal vascularity. Similarly in Fuji intelligent color enhancement (FICE) (Fujiinon, Japan) image is processed mathematically. Pentax, Japan utilises i-SCAN to enhance mucosal vascularity. Fujifilm, Japan enhances the superficial vascularity using blue light with blue light imaging (BLI) and linked color imaging (LCI) techniques. All these modalities have been shown to be more accurate than the conventional HD-WLE and the images produced correlate better with the histologic findings in terms of extent and degree of disease activity.

Endocytoscopy: This is an imaging technique wherein the microscopic visualization of the superficial mucosal layer (50µm in depth) is feasible during the endoscopy procedure. It correlates 100% with histopathology assessment.

Confocal laser endomicroscopy: This can analyse the microscopy up to a depth of 250µm. It can reveal for example in ulcerative colitis (UC), mucosal pathologies as inflammation, impaired and distorted crypt regeneration, and abnormal vascular patterns.

Artificial intelligence: It is useful where observer variation is suspected. A computer aided system with endocytoscopy is used to predict inflammation in UC. It provides good sensitivity, specificity, and accuracy.

Molecular imaging: It uses administration of fluorescent labeled antibody in conjunction with Confocal laser endomicroscopy for the assessment of for membrane-bound TNF in CD.

2. European guidelines on microscopic colitis: United European Gastroenterology (UEG) and European Microscopic Colitis Group (EMCG) statements and recommendations

Miehlike S, Guagnozzi D, Zabana Y et al. European guidelines on microscopic colitis: United European Gastroenterology and European Microscopic Colitis Group statements and recommendations. *United European Gastroenterol J.* 2021 Feb 22. doi: 10.1177/2050640620951905. Epub ahead of print. PMID: 33619914.

Microscopic colitis (MC) is a form of chronic inflammatory bowel disease characterised by chronic watery, non-bloody diarrhoea with a normal or almost normal endoscopic appearance of the colon, and a distinct histologic pattern of collagenous colitis or lymphocytic colitis. It may be associated with fecal urgency, nocturnal stools and fecal incontinence. MC is a complex interplay of luminal factors, immune dysregulation and genetics. The overall incidence is 11.4 cases per 100,000 person-years in western countries and the overall frequency in patients with unexplained chronic watery diarrhoea is 12.8%. Prolong use of proton pump inhibitors (PPIs), nonsteroidal anti-inflammatory drugs (NSAIDs) or selective serotonin reuptake inhibitors (SSRIs) and female gender are risk factors for the development of MC. Disease activity and clinical remission can be assessed by the Hjortswang criteria or MC Disease Activity Index. Endoscopy shows normal appearing mucosa so an elaborate biopsy from right as well as left colon should be obtained. Histology with thickened subepithelial collagenous band along with increased inflammatory infiltrates in lamina propria, confirms the diagnosis. Oral budesonide remains the mainstay of treatment to induce as well as maintain the remission. There is no risk of adverse effect with long term budesonide, however it may be associated with decreased bone mineral density. In case of relapse or no response, thiopurines, anti-tumor necrosis factor (TNF) drugs or vedolizumab can be used in selected patients. In case of failure of medical therapy surgical options as ileostomy or sigmoidostomy can be offered. Surveillance colonoscopy or histological monitoring is not recommended.

3. Impact of Trans-anal Irrigation Device in the Management of Children With Fecal Incontinence and Constipation

Patel S, Hopson P, Bornstein J, Safder S. Impact of Transanal Irrigation Device in the Management of Children With Fecal Incontinence and Constipation. *J Pediatr Gastroenterol Nutr.* 2020

Sep;71(3):292-297. doi: 10.1097/MPG.0000000000002785. PMID: 32404764.

Patients having neurogenic bowel (NBD), anorectal malformation (ARM) or refractory constipation (RC) often have social stigma associated due to fecal incontinence, also the constipation is refractory to medical therapy, diet, toilet training and behavioural therapy.

This is a retrospective study involving 147 patients with NBD, ARM and RC. Bowel management was done using Trans-anal irrigation (TAI) and results were analysed.

The main objective of TAI is to provide an empty distal colon thereby reducing the chances of incontinence TAI device consists of a pump, a water bag and a rectal catheter with soft inflatable balloon. The catheter is placed into the rectum and balloon is inflated to create a seal. Irrigation is done with a 10-20ml/kg of water once or twice daily. TAI benefitted all the patients in terms of relieving fecal incontinence, constipation and abdominal pain. Few side effects as pain during insertion, abdominal cramps during irrigation, difficulty in catheter retention and perianal irritation were experienced.

4. Fulminant Wilson Disease in Children: Recovery After Plasma Exchange Without Transplantation

Proost, Renee & Cassiman et al. (2020). Fulminant Wilson Disease in Children: Recovery After Plasma Exchange Without Transplantation. *Journal of Pediatric Gastroenterology & Nutrition*. Publish Ahead of Print. 10.1097/MPG.0000000000002894.

Liver transplant (LT) remains the mainstay of treatment in fulminant Wilson disease (WD). There have been many publications outlining the importance of plasma exchange (PE) as a bridge therapy before transplant. The main principal behind is elimination of high levels of free circulating copper which is a result of liver cell necrosis in fulminant WD. These free copper lead to damage to the red blood cells and hemolytic anemia, and other classic symptoms of acute liver failure. This paper presents a patient with fulminant WD with New Wilson Index of 14 (> 11 is a predictor of mortality without transplant) who underwent PE and had a transplant free survival. This girl was diagnosed as WD at the age of 7 years and landed up in acute liver failure without encephalopathy at the age of 14 years. She was started on PE with 10 sessions over 10 days where 3L of plasma was exchanged over 2 hours in each session. Calcium gluconate was administered to combat hypocalcaemia. She was kept of D-penicillamine therapy. She had marked improvement in hepatic functions by one month of therapy. Her MELD score improved from 24 to 20 and Child Pugh from C 12 to B7 after a month. There was no requirement of LT after 3 months on reassessment and the girl remained asymptomatic with normal liver function tests till 3 years of follow up. According to this paper, after literature search 29 relevant articles were found on PE wherein a total of 63 patients have been described aged 5-30 years. Transplant free survival was observed in 25 patients (40%), 28 patients (44%) needed and received LT, and 10 died (16%). This paper proposes that PE should be considered in fulminant WD if transplant option is not there due to various reasons or if the patient is on the waiting list for transplant.

Compiled by Dr Rimjhim Srivastava

Publications by ISPGHAN members in Pubmed Indexed Journals (October 2020 – February 2021)

OCTOBER 2020

[1.] Mahajan S, Lal BB, Sood V, Khillan V, Khanna R, Alam S. **Difficult-to-treat ascitic fluid infection is a predictor of transplant-free survival in childhood decompensated chronic liver disease.** *Indian J Gastroenterol.* 2020 Oct; 39(5):465-472. doi: 10.1007/s12664-020-01081-4. Epub 2020 Oct 24.

This was a retrospective study aimed to assess the clinico-bacteriological profile of ascitic fluid infection (AFI) and its impact on outcome in childhood chronic liver disease (CLD). The authors concluded that children with ascites should undergo a diagnostic paracentesis in presence of fever, increasing or new-onset ascites, and/or increased TLC. Death or liver transplant is more likely due to advanced liver disease (high PELD /HE) and in those with difficult-to-treat AFI.

NOVEMBER 2020

[2.] Reddy PM, Kulkarni S, Nabi Z, Kasle S, Chavan R, Pal P, Shrimal P, Choudhary H, Sayyed M, Reddy DN. **Single balloon enteroscopy in children for evaluation of small bowel diseases in children: A large, tertiary center study.** *J Pediatr Surg.* 2020 Nov 2:S0022-3468(20)30778-8. doi: 10.1016/j.jpedsurg.2020.10.025. Epub ahead of print.

In this study, authors have aimed to evaluate the safety and utility of single balloon enteroscopy (SBE) in children. 189-SBE procedures (males 117, mean age 15.1 ± 2.76, range 3-18 years) were performed in 174-children. The indications for SBE were chronic abdominal pain in 119 (68.4%), gastrointestinal bleed 17 (9.8%), chronic diarrhea 17 (9.8%) and vomiting 13 (7.5%). Antegrade, retrograde and combined SBE were performed in 98 (51.8%), 77 (40.7%), 7 (3.7%) children, respectively. The mean length of small bowel intubation in antegrade and retrograde SBE groups were 168.9 ± 58.6 cm and 120.7 ± 52.1 cm, respectively. Overall, a positive finding was seen in 117 (67.2%) cases. The most common findings were ileal and jejunal ulcers with or without strictures in 76 (64.9%) children. A total of 18 therapeutic enteroscopic procedures were performed. There were no major adverse events. Authors have concluded that SBE is a safe and effective procedure for the evaluation and management of small bowel diseases in children.

[3.] Kesavelu D Sr, Rohit A, Karunasagar I, Karunasagar I. **Composition and Laboratory Correlation of Commercial Probiotics in India.** *Cureus.* 2020 Nov 5; 12(11):e11334. doi: 10.7759/cureus.11334.

Out of the 20 chosen probiotics eight products were single strain and 12 products were multiple strains. These probiotics showed very poor correlation between the declared contents on the pack and lab values in viable cell count colonies, the genus and species strain identification, presence of

contaminants and these were confirmed with 16s RNA and next generation sequencing. They have concluded that poor correlation in the quality and quantity of probiotics proves that the label claim and actual claim of these “drugs” show exceptionally poor correlation and raises safety concerns in clinical use, especially in vulnerable age groups such as neonates, children and the elderly.

[4.] Aneja A, Meena S, Venkatesh V, Lal SB. **Pulmonary thromboembolism: A rare complication of amoebic liver abscess in a child.** *JGH Open.* 2020 Nov 9;5(1):169-171. doi: 10.1002/jgh3.12440.

Amoebic liver abscess is common in children in developing countries due to lack of hygiene and sanitary conditions. Inferior vena cava thrombosis is a rare complication of this disease, with only a few cases reported in the literature, where this thrombus led to pulmonary thromboembolism. Authors have reported the case of a 7-year-old child with amoebic liver abscess who developed pulmonary thromboembolism and was promptly diagnosed and managed.

[5.] Surender Kumar Yachha , Mridul Chandra Das, Praveen Kumar, Lokesh Sharma , Sumit Kumar Singh, Moinak Sen Sarma, Anup Kumar, Anshu Srivastava, Ujjal Poddar

Development of integrated neonatal cholestasis card for early recognition and referral of neonatal cholestasis. *Indian J Gastroenterol.* 2020 Dec; 39(6):584-590. doi: 10.1007/s12664-020-01094-z. Epub 2020 Nov 11.

In this multi-center study, the authors aimed to evaluate the reliability of the stool card in the Indian population and develop an integrated neonatal cholestasis (NC) card with (a) urine color identification and (b) stool color for early referral. Of 319 children (Biliary Atresia {BA} [n = 58], non-BA [n = 62], and controls [n = 199]), parents correctly detected dark yellow urine in all NC. Stool samples of 50 (86%) children with BA were unanimously labeled as pale by all observers. The average inter-item correlation showed good correlation between parents and trainee doctors of 0.77 and 0.64 with par-medical staff. The authors conclude that integrated NC card proposes to recognize neonatal cholestasis at an early stage irrespective of etiology. It is a major step towards public health benefit both at the community as well as physicians' levels to enable early detection and timely referral and management.

[6.] Banerjee R, Pal P, Nabi Z, Shava U, Ganesh G, Reddy DN. **Very early onset inflammatory bowel disease in a South Asian country where inflammatory bowel disease is emerging: a distinct clinical phenotype from later onset disease.** *Intest Res.* 2020 Nov 20. doi: 10.5217/ir.2020.00107. Epub ahead of print.

Authors have aimed to evaluate characteristics of VEOIBD and later onset PIBD (LO-PIBD) in India. They have performed a retrospective analysis of a large, prospectively maintained IBD registry. PIBD was divided into VEOIBD (< 6 years) and LO-PIBD (6-17 years). Demographic data,

disease characteristics and treatment were compared between the PIBD groups and with other Asian/Western studies as well as the adult patients of the registry. Of 3,752 IBD patients, 292 (7.8%) had PIBD (0-17 years) (175 Crohn's disease [CD], 113 ulcerative colitis [UC], 4 IBD-undifferentiated; 22 VEOIBD [7.5%], and 270 LO-PIBD [92.5%]). VEOIBD patients had more severe disease compared to LO-PIBD in both UC ($P=0.003$) and CD ($P<0.001$). Familial IBD was more common in VEOIBD (13.6%) compared to LO-PIBD (9.2%). Ileal disease (L1) was an independent risk factor for diagnostic delay in pediatric CD. Diagnostic delay (>6 months) was significantly lower in VEOIBD (40.9%) than in LO-PIBD (78.8%) ($P<0.001$). Compared to other Asian and Western studies, extensive UC (72.5%) and complicated CD (stricturing/penetrating: 42.7%) were relatively more common. Perianal CD was relatively less frequent (7.4%). PIBD had a significantly higher number of complicated and ileal CD and extensive UC comparison to adult cohort of the registry.

[7.] **Surinder Singh Rana, Sadhna Bhasin Lal. Esophageal obstruction in a child secondary to large walled-off necrosis: rescue transmural drainage using forward-viewing echoendoscope. *Annals of Gastroenterology*. 2020 November 20. DOI: <https://doi.org/10.20524/aog.2020.0555>. Published online ahead of print.**

This was a case report of a 12 year old child with walled off pancreatic necrosis (WOPN) in the lesser sac, published as an image of the month. Authors initially attempted endoscopic ultrasound (EUS)-guided transmural drainage of the WOPN using a conventional curved linear array echoendoscope. However, the echoendoscope could not be negotiated across the gastroesophageal junction (GEJ) because of extrinsic compression by the WOPN resulting in acute angulation. Subsequently endoscopic ultrasound (EUS)-guided drainage using the forward-viewing echoendoscope was done: a guidewire was coiled inside the walled-off necrosis and the access site was dilated using 4-mm biliary balloon dilator. A 14-mm wide fully covered bi-flanged self-expanding metallic stent was deployed under EUS and fluoroscopic guidance.

[8.] **Venkatesh V, Aneja A, Kumar A, Ramachandran R, Lal SB. Bilateral renal cortical necrosis in a child with acute pancreatitis. *Saudi J Kidney Dis Transpl*. 2020 Nov-Dec; 31(6):1395-1398. doi: 10.4103/1319-2442.308353.**

There are many causes for the occurrence of renal cortical necrosis in children, with severe pancreatitis being a rarity. In this case report, authors have described a child with severe acute pancreatitis complicated by bilateral RCN.

DECEMBER 2020

[9.] **Bapaye A, Dashatwar P, Biradar V, Biradar S, Pujari R. Initial experience with per-rectal endoscopic myotomy for Hirschsprung's disease: medium and long term outcomes of the first case series of a novel third-space endoscopy procedure. *Endoscopy*. 2020 Dec 8. doi: 10.1055/a-1332-6902. Epub ahead of print.**

Per-rectal endoscopic myotomy (PREM) is a novel third-space endoscopy technique for treating short-segment (SS)-HSCR. Author has done a retrospective study of SS-HSCR patients diagnosed on history, contrast enema, rectal biopsies, and anorectal manometry, and treated by PREM. The aganglionic segment was mapped before PREM was performed using third-space endoscopy principles. Stool frequency and

laxative usage before and after PREM were compared. They have concluded that PREM is a safe and effective minimally invasive procedure to treat SS-HSCR and results in long-term response.

[10.] **Venkatesh V, Lal SB, Rana SS, Anushree N, Aneja A, Seetharaman K, Saxena A. Pancreatic ascites and Pleural Effusion in Children: Clinical Profile, Management and Outcomes. *Pancreatolgy*. 2021 Jan; 21(1):98-102. doi: 10.1016/j.pan.2020.12.010. Epub 2020 Dec 14.**

A retrospective review of children with pancreatic ascites (PA) / pancreatic pleural effusion (PPE) diagnosed and managed at authors' centre over the last 4 years was performed. The clinical, biochemical, radiological and management profiles were analyzed. Conservative management (nil per oral, octreotide and drainage using either percutaneous catheter or repeated paracentesis) and ERCP plus transpapillary stenting results in resolution of majority of pediatric PA/PPE. Children presenting with PA/PPE needs to be evaluated for CP.

[11.] **Cherukuru R, Menon J, Patel K, Thambidurai R, Subbiah K, Shanmugam NP, Reddy MS, Rela M. Uncommon presentation of a recurrent diaphragmatic hernia after pediatric liver transplantation. *Pediatr Transplant*. 2020 Dec; 24(8):e13790. doi: 10.1111/petr.13790.**

Diaphragmatic hernia (DH) is a rare but well-recognized complication of pediatric liver transplantation (PLT). However, a recurrent DH in the setting of PLT has not been reported. We report the case of a child who had previously undergone a DH repair early after PLT and presented more than two years later with atypical findings of severe sepsis and a tender abdominal swelling.

[12.] **Pawaria A, Sood V, Lal BB, Khanna R, Bajpai M, Alam S. Ninety days transplant free survival with high volume plasma exchange in Wilson disease presenting as acute liver failure. *J Clin Apher*. 2021 Feb;36(1):109-117. doi: 10.1002/jca.21848. Epub 2020 Dec 28.**

The aim was to study the efficacy and safety of high volume plasma exchange (HVPE) in Wilson disease presenting as acute liver failure (WD-ALF). Outcome measure was transplant free survival (TFS) at 90 days post enrollment. Median days of survival was 38 days (IQR 12-63) in HVPE group vs 14 (IQR 5-22) days in standard medical therapy group.

JANUARY 2021

[13.] **Pankaj Puri, Radha K. Dhiman, Sunil Taneja, Puneeta Tandon, Manuela Merli, Anil C. Anand, Anil Arora, Subrat K. Acharya, Jaya Benjamin, Yogesh K. Chawla, Sunil Dadhich, Ajay Duseja, C. E. Eapan, Amit Goel, Naveen Kalra, Dharmesh Kapoor, Ashish Kumar, Kaushal Madan, Aabha Nagral, Gaurav Pandey, Padaki N. Rao, Sanjiv Saigal, Neeraj Saraf, Vivek A. Saraswat, Anoop Saraya, Shiv K. Sarin, Praveen Sharma, Shalimar, Akash Shukla, Sandeep S. Sidhu, Namrata Singh, Shivaram P. Singh, Anshu Srivastava, Manav Wadhawan. Nutrition in Chronic Liver Disease: Consensus Statement of the Indian National Association for Study of the Liver. *J Clin Exp Hepatol* 2021; 11:97-143.**

This consensus statement of the Indian National Association for Study of the Liver provides a comprehensive review of nutrition in chronic liver disease and gives recommendations for nutritional screening and treatment in specific clinical

scenarios of malnutrition in cirrhosis in adults as well as children with chronic liver disease and metabolic disorders.

[14.] Mandelia A, Sharma MS, Siddiqui Y, Mishra A. **Division of long residual spur after Duhamel's pull through with endo-GIA stapler under colonoscopic guidance.** *J Indian Assoc Pediatr Surg* 2021;26:69-70.

The authors have concluded that the division of residual spur after Duhamel's procedure with endoGIA stapling device under colonoscopic guidance is feasible and safe by reporting the procedure in a 6 year old girl who had undergone a levelling colostomy in the newborn period followed by a Duhamel's pull through at 1 year of age for Hirschsprung's disease. It avoids the need for a redo laparotomy for dividing the spur, especially in cases where the spur is high and long and not accessible per anally for division. Furthermore, realtime assessment of the completeness of spur division is ensured.

[15.] Koul R, Lal BB, Pamecha V, Sarin S, Alam S. **Liver Transplantation Reverses Hepatic Myelopathy in 2 Children With Hepatitis A Infection.** *Child Neurol Open.* 2021 Jan 11;8:2329048X20983763. doi: 10.1177/2329048X20983763.

Hepatic myelopathy following acute fulminant liver failure is rarely seen and reported. Two children in this series had hepatic myelopathy following HE after acute fulminant hepatitis A infection, which reversed after liver transplantation.

[16.] Mehtab W, Sachdev V, Singh A, Agarwal S, Singh N, Malik R, Malhotra A, Ahuja V, Makharia G. **Gluten content in labeled and unlabeled gluten-free food products used by patients with celiac disease.** *Eur J Clin Nutr.* 2021 Jan 18. doi: 10.1038/s41430-020-00854-6. Epub ahead of print.

Authors have aimed to evaluate gluten content in labeled, imported, and non-labeled gluten free (GF) food products currently available in the Indian market. They have concluded that a substantial proportion (10.1%) of GF food products (both labeled and non-labeled) available in India have gluten content greater than the prescribed limits of <20 mg/kg. Physicians, dietitians, support group, and patients with celiac disease should be made aware of this fact and regulatory bodies should ensure quality assurance.

FEBRUARY 2021

[17.] Bhardwaj, Anubhuti; Deswal, Shivani; Mohan, Neelam **Acute Pancreatitis Induced Thrombotic Microangiopathy with Acute Renal Failure: A Rare Complication!**, *JPGN Reports: February 2021 - Volume 2 - Issue 1 - p e038* doi: 10.1097/PG9.0000000000000038

Authors have reported an adolescent girl with severe acute pancreatitis presenting with anuria and diagnosed as microangiopathic hemolytic anemia with thrombocytopenia (MAHA-T). Early initiation of plasma exchange therapy yielded a good outcome.

[18.] Bolia R, Mandal D, Bhat NK. **Gastrocutaneous fistula secondary to drainage tube penetration in a child: Closure using argon plasma coagulation.** *Indian J Gastroenterol.* 2021 Feb; 40(1):94-95. doi: 10.1007/s12664-020-01100-4.

In this case report published as an image authors have reported on the successful closure of gastrocutaneous fistula resulting from intercostal catheter drain (ICD) necessitated during the surgical treatment of foregut duplication cyst in a 4 year old girl with argon plasma coagulation.

[19.] Maji P, Malik R, Madhusudhan KS, Sharma S. **Utility and Safety of Transjugular Liver Biopsy in Children.** *Indian J Pediatr.* 2021 Feb 2. doi: 10.1007/s12098-020-03650-z. Epub ahead of print.

The authors have aimed to evaluate the safety, efficacy and utility of transjugular liver biopsy (TJLB) in pediatric patients with contraindications to PLB (percutaneous liver biopsy). They have observed that technical success rate with adequate biopsy sample was 95.8% (23/24) with no major complications. A new diagnosis was established in 9 (37.5%) cases and 14 (58.34%) biopsies confirmed the initial diagnoses. Four cases also revealed additional information guiding overall management. It was concluded that TJLB is a safe and useful procedure in children.

[20.] Das S, Lal SB, Venkatesh V, Bhattacharya A, Saxena A, Thapa BR, Rana SV. **Gallbladder motility in children with celiac disease before and after gluten-free diet.** *Ann Gastroenterol.* 2021;34(3):385-391. doi: 10.20524/aog.2021.0593. Epub 2021 Feb 5.

Gallbladder (GB) hypomotility has been reported in adults with celiac disease (CD), but there is no literature on GB dysfunction in children with CD. Authors have aimed to study GB motility in children with CD, before and after a gluten-free diet (GFD), using ultrasonography (USG) and technetium-99 labeled mebrofenin hepatobiliary scintigraphy (HBS). They have concluded that GB function is impaired in at least 16% of children with CD at diagnosis and is reversible with GFD. GB dysfunction is significantly associated with a delayed diagnosis and may be a part of general gastrointestinal dysmotility.

[21.] Chaubal G, Nanavati AJ, Biradar V, Tambe S, Hatimi H, Deshpande A, Hanchnale P, Bhalerao S. **Monosegment Liver Allografts for Liver Transplantation in Infants Weighing Less Than 6 kg: An Initial Indian Experience.** *Transplant Proc.* 2021 Jun;53(5):1670-1673. doi: 10.1016/j.transproceed.2021.01.005. Epub 2021 Feb 8.

Living donor liver transplantation in small infants is a significant challenge. Liver allografts from adults may be large in size. This is accompanied by problems of graft perfusion, dysfunction, and the inability to achieve primary closure of the abdomen. Monosegment grafts are a way to address these issues. Two recipients in our cohort weighed less than 6 kg. The prospective left lateral segments from their donors were large for size. Therefore, monosegment 2 liver grafts were harvested. Data regarding the preoperative, intraoperative, and postoperative events in the donor and the recipient were recorded. Monosegment 2 liver allografts are safe and effective for use in living donor liver transplantation in small infants weighing less than 6 kg.

[22.] Reddy MS, Menon J, Hakeem AR, Murugesan S, Narasimhan G, Shanmugham N, Rela M. **How can we reduce the impact of COVID-19 pandemic on timely access to liver transplantation in children?** *Hepatol Int.* 2021 Feb;15(1):215-216. doi: 10.1007/s12072-020-10128-9. Epub 2021 Jan 27.

In this letter to the editor, authors have shared their centre data which shows that while pediatric referrals for LT reduced during the COVID-19 pandemic, children referred during this period were sicker, probably reflecting a level of selective referral during this period. Timely pediatric LDLT could be safely performed for most children via a COVID-free clinical pathway. Increased use of electronic documentation and

remote authentication may avoid logistic delays to performing LDLT for these sick children.

[23.] Ritu -, Madhusudhan KS, Malik R. **Hepatic Visceral Larva Migrans Causing Hepatic Artery Pseudo-Aneurysm.** *Indian Pediatr.* 2021 Feb 15; 58(2):184-186. doi: 10.1007/s13312-021-2141-6.

In this clinical case letter authors have reported a successfully managed case of hepatic visceral larva migrans (VLM) in a 12 year old girl who presented with high grade fever, jaundice and right upper abdominal pain with progressive abdominal distension associated with weight loss for four months and a history of recurrent black tarry stools requiring blood transfusions and highlight that hepatic VLM can be a rare cause of hepatic artery pseudoaneurysm resulting in upper gastrointestinal bleeding. They conclude that early recognition and comprehensive management is of utmost importance.

[24.] Bhav S, Sapru A, Bavdekar A, Jain R, Debnath K, Kapatkar V. **Long term Immunogenicity of Single Dose of Live Attenuated Hepatitis A Vaccine in Indian Children - Results of 15-year Follow-up.** *Indian Pediatr.* 2021 Feb 19;S097475591600293. Epub ahead of print. PMID: 33612491.

The objective of this study was to measure anti-HAV antibodies 15 years after a single dose of live attenuated hepatitis A vaccine in Indian children administered in 2004. The study concluded that single dose of live attenuated hepatitis A vaccine in Indian children demonstrated robust immunogenicity at 15 years post vaccination with a seroprotection rate of 86.2%..

[25.] Vijay P, Lal BB, Sood V, Khanna R, Patidar Y, Alam S. **Dynamic Optic Nerve Sheath Diameter (ONSD) guided management of raised intracranial pressure in pediatric acute liver failure.** *Hepato Int.* 2021 Apr; 15(2):502-509. doi: 10.1007/s12072-021-10139-0. Epub 2021 Feb 24.

The objectives were to evaluate the role of optic nerve sheath diameter (ONSD) to detect raised intracranial pressure (ICP) in pediatric acute liver failure (PALF), study the variations in ONSD with ICP-lowering measures and to evaluate its prognostic role. The study concluded that ONSD is a simple, bedside, inexpensive, reproducible and repeatable modality to assess ongoing change in ICP in PALF. ONSD more than 4.55 mm suggests raised ICP. The goal should be to bring ONSD down to less than 4.6 mm within 24 hour by aggressive anti-ICP therapy to achieve favourable outcome.

MISSED INADVERTENTLY IN PREVIOUS ISSUES

[1.] Poddar U, Yachha SK, Srivastava A, Kumari N. **Pediatric inflammatory bowel disease: Is it really uncommon in Asian children?** *JGH Open.* 2020 Apr 26; 4(5):860-866. doi: 10.1002/jgh3.12330.

Authors have analyzed their centre experience of pediatric inflammatory bowel disease (IBD) using a prospectively maintained data of 105 consecutive children [median age 12 (IQR:7-14) years, 71 males] with IBD from July 2001 through June 2016. They have concluded that IBD is not uncommon, and the incidence seems to be increasing among Indian children in last 5 years compared to previous 10 years. UC (52%)

is more common than CD (41%) and is more often an extensive disease (75%). CD is mainly an inflammatory phenotype (65%). The majority of children with IBD required an immunomodulator to maintain remission. In CD, there was a significant reduction in the use of empirical antitubercular therapy (76%, $P = 0.008$) with time.

[2.] Thirumal P, Sumathi B, Nirmala D. **A Clinical Entity Often Missed-Solitary Rectal Ulcer Syndrome in Children.** *Front Pediatr.* 2020 Jul 17; 8:396. doi: 10.3389/fped.2020.00396.

Authors have aimed to study the clinical profile and treatment response of solitary rectal ulcer syndrome in children (SRUS). The median age of presentation among 24 children was 8 years with majority (75%) above 5 years. All children presented with intermittent rectal bleeding with median duration of 5.5 months. The other presenting symptoms documented were hard stool (79%), mucorrhea (70%), and abdominal pain (58%). One child presented with rectal prolapse. On colonoscopy, 46% had single ulcer while another 46% had multiple ulcers and 8% had polypoidal lesion. All lesions were within distal rectum and had characteristic histological pattern. All children were treated with conventional treatment like dietary fibers and laxatives along with toilet training. About 75% children attained remission and 25% had relapse but responded with corticosteroid enema. None required surgery. They have concluded that conventional treatments itself induce and maintain remission in most of SRUS patients if treatment is instituted at the earliest.

[3.] Bhattarai D, Vignesh P, Kaur A, Kumari P, V Menon J, Geethanjali G, Rawat A. **Epstein-Barr virus-associated lymphocytic cholangitis in a child with X-linked lymphoproliferative syndrome.** *Scand J Immunol.* 2021 Feb; 93(2):e12975. doi: 10.1111/sji.12975. Epub 2020 Sep 23.

In this letter to the editor, authors have reported on a 4-year-old boy who presented with one-month history of high-grade intermittent fever and diffuse dull-aching abdominal pain. Evaluation has revealed pallor, generalized lymphadenopathy, progressively increasing liver size (span: 15 cm) and conjugated hyperbilirubinemia. He was subsequently diagnosed to be affected with X-linked lymphoproliferative disease (XLP) and the presenting symptoms due to EBV-related lymphocytic cholangitis (LC) which was managed medically. This case emphasizes that LC must be suspected in children with persistent fever of unknown origin and raised liver enzymes, and XLP must be ruled out in cases of EBV-associated LC.

[4.] Swaminathan A, Sathiyasekaran M, Padankatti S, Padankatti RB, Arulprakash S, Raj R. **A rare cause of rectovaginal fistula in early infancy: It is in the genes!** *J Indian Assoc Pediatr Surg* 2020; DOI: 10.4103/jiaps.JIAPS_217_20. Accepted for publication 2020 September 5

Authors have reported the case of 2 month old infant girl with an acquired RVF with extraintestinal features due to rare IL10RB mutation who underwent hematopoietic stem cell transplantation (HSCT) to highlight the importance of thinking beyond the local anatomy and looking into the genetic domain and role HSCT in the management of Infantile onset IBD (IOIBD).

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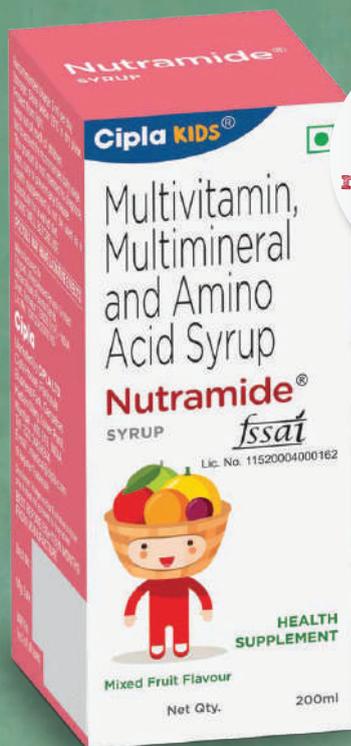
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