JOURNAL WATCH

1. Who's at Risk? A Prognostic Model for Severity Prediction in Pediatric Acute Pancreatitis

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Following the classification of acute pancreatitis (AP) in mild, moderately severe and severe pancreatitis (SAP) by the North American Society for Pediatric Gastroenterology, Hepatology and Nutrition (NASPGHAN) in 2017, there was a need for predictive markers of severity on admission. Vitale et al in 2017, identified blood urea nitrogen (BUN) on admission, as a significant predictor of severe AP in pediatric population.

This study was aimed to validate the Vitale model and to evaluate the role of BUN change after admission. A total of 73 children were included in the study, out of which 51 belonged to mild AP and 22 belonged to severe AP group. BUN and serum albumin were measured and analysed. It was observed that there was a significant difference in the BUN of children with SAP (median 14.5 mg/dL) and mild AP (median 11 mg/dL). Also, the serum albumin levels were significantly higher in the mild AP (median 4.0 g/dL) group as compared to the SAP group (median 3.3 g/dL). BUN was observed as a significant predictor of SAP with a sensitivity of 68%, specificity of 73%, positive predictive value of 52% and negative predictive value of 84%. The cut off level of BUN was suggested as 13 mg/dL where an increase in the level of BUN increased the specificity. They also observed that adding serum albumin created a better predictive model for SAP and improved the sensitivity and specificity to 71 % and 79 % respectively. It was concluded that BUN>13 mg/dL and serum albumin<3.6 g/dL were associated with an increased probability of developing SAP.

For further perusal of the effect of BUN change at 24-48 hours, 176 patients were included. Thirty nine patients had SAP. It was observed that patients in SAP group (n=22) had a significantly higher BUN values 24-48 hours post admission even after fluid resuscitation compared to the mild AP group. It was concluded that elevated BUN levels within 24 to 48 hours of admission were an independent predictor of developing SAP. Though this study was limited in size, a cut off of 13 mg/dL will help triage patients.

2. ACG Clinical Guidelines: Clinical Use of Esophageal Physiologic Testing

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Esophageal physiologic testing plays a vital role in clinical evaluation and management of varied esophageal disorders as gastroesophageal reflux disease (GERD), structural disorders, motor dysfunction, behavioral or functional disorders. Frequently used esophageal physiological tests include esophageal manometry, ambulatory reflux monitoring, and barium esophagram and recently approved functional lumen imaging probe (FLIP). This guideline summarizes the evidence underlying the use of each physiologic test present in the literature, and provides key concepts and recommendations for appropriate use of these tests. Following are the recommendations:

a. High resolution esophageal manometry (HRM) should be used for esophageal motility disorders and is more accurate as well as easier for the identification of obstructive motor disorders than conventional manometry. Barium esophagram has suboptimal screening role for the detection of esophageal dysmotility in patients with esophageal dysphagia.
b. There is a definite utility of provocative maneuvers along with the standard protocol of 10 supine test swallows. Maneuvers as multiple rapid 2ml water swallows, rapid drinking of 100-200ml water with straw, a standardized test meal, etc., improve the diagnostic yields in obstructive symptoms.
c. For obstructive symptoms including achalasia, a timed upright esophgram should be used. Barium heights < 0.5 cm at 1 minute and < 0.2 cm at 5 minutes are significant. Inclusion of 13mm barium tablet along with esophgram will improve the yield in obstructive syndromes.
d. FLIP can determine esophageal pressure, cross sectional area and distensibility simultaneously. Achalasia subtypes are defined by detecting nonocclusive esophageal contractions which is not observed with HRM. It is specifically valued in the identification of achalasia; outflow obstruction with borderline manometric findings and in persistence of symptoms despite the management of outflow obstruction.
e. FLIP can be used to measure distensibility or minimal cross-sectional area intra procedurally during an invasive treatment of achalasia though the protocol needs to be defined. Also, it may be considered for measurement of distensibility to assess fibro-stenotic remodeling of the esophagus and stratify risk of food impaction in patients with eosinophillic esophagitis.
f. For GERD, the sensitivity and specificity of patient-reported symptoms for diagnosis is modest 68% and 72%; the utility of emperical PPI therapy is limited and the sensitivity of endoscopy is low. So, it is recommended that ambulatory reflux monitoring as esophageal pH monitoring or pH impedance monitoring for the assessment of abnormal acid exposure should be utilized over patient-reported symptoms or empirical PPI test, in cases where endoscopy has not been done or is inconclusive. Ambulatory ph monitoring should be done when the patient is off anti-secretory treatment and prolonged wireless pH monitor should be used.
g. HRM can be used to rule out associated motor disorders in GERD and should be performed before surgery. HRM is helpful along with endoscopy and esophgram for identifying hiatal hernia.

h. It is recommended that abnormal acid exposure time (AET) should be considered a predictor for treatment outcome after surgery in GERD.
i. For extra esophageal reflux pH impedance monitoring should be performed off acid suppression and empirical trail of PPI should not be used.
j. For suspected rumination, high-resolution impedance manometry (HRIM)with postprandial monitoring should be used
k. In patients with excessive belching, pH impedance monitoring can be used to confirm the diagnosis of supragastric belching.

3. NASPGHAN and the Society for Pediatric Radiology Joint Position Paper on Non-Invasive Imaging Of Pediatric Pancreatitis: Literature Summary And Recommendations

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Optimal strategy for imaging in pancreatitis is limited. This recommendation is based on relevant pediatric articles and focuses on the non-invasive imaging in acute pancreatitis (AP), acute recurrent pancreatitis (ARP) and chronic pancreatitis (CP), other than endoscopic procedures. The role of imaging in pancreatitis is to confirm the diagnosis, assess the progression and complication , identify potential etiologies and guide interventions. Following are the recommendations:

a. It is recommended that CT should be performed with intravenous contrast as a single portal venous phase exam and though for MRI intravenous contrast is not always needed but it can aid in the assessment of vasculature and for the identification of necrosis and autoimmune pancreatitis.
b. For acute pancreatitis , the recommended first line non invasive imaging modality is trans-abdominal ultrasound(USG). Though it has low to moderate sensitivity, it can identify biliary causes and is also helpful in the identification of resolution and progression of fluid collections. If USG is negative , then either CT or MRI is advised which can identify suspected complications and characterize the degree of organization of collections prior to interventions.
c. For ARP, MRI is recommended to identify structural or obstructive causes with an advantage of high soft tissue contrast and ability to assess the pancreatic and biliary ducts. MRI can also be used to follow up children with ARP to CP as it can monitor changes in parenchyma and duct. For smaller children requiring sedation MRI can be alternated with USG or CT for follow up.
d. For CP, MRI is the recommended modality as there is better characterization of parenchyma and duct. For a known episode of AP in a child with CP, USG should be the preferred first line modality, later if it is negative, CT or MRI can be utilized which can also define the fluid collection and aid in planning for intervention.

4. Lipidomics in Nonalcoholic Fatty Liver Disease: Exploring Serum Lipids as Biomarkers for Pediatric Nonalcoholic Fatty Liver Disease

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Nonalcoholic Fatty Liver Disease (NAFLD) is the most prevalent chronic liver disease in children in the developed world, affecting 34.2% of obese children with presence of fibrosis at diagnosis in almost 16% of children, and can progress to cirrhosis or liver failure. Liver function tests and ultrasonography are the recommended primary screening for NAFLD, both can detect steatosis but lack accuracy. Lipidomics is an upcoming analytical technique for identification of lipidome of tissues and body fluids. This pilot study was conducted with the background information that lipid profiles in adults with NAFLD are different as compared to healthy controls. The aim of this study to develop new non invasive diagnostic biomarkers for NAFLD using lipdomics by identifying plasma lipids that correlate well with steatosis in children. This study included 21 children with obesity and steatosis which was confirmed by using proton magnetic resonance spectroscopy, and 21 children with obesity but without steatosis as control. The median age was 15 years and 57% were boys. A total of 18 lipid classes constituting 839 different lipid species were identified and analyzed. It was observed that in children with NAFLD, there was an overall significant increase in alkyl-diacylglycerols (TG[O]) and phosphatidylethanolamine (PE) along with a significant decrease in different etherphospholipid classes namely alkyl/alkenyl-phosphatidylethanolamine (PE[O]), alkyl/alkenyl-lysophosphatidylethanolamine (LPE[O]) and alkyl/alkenyl-phosphatidylcholine (PC[O])classes. It was concluded that lipid species and classes are potential biomarkers for steatosis however larger lipidomic studies are needed to determine the diagnostic value of these lipids.

Compiled by **Dr. Rimjhim Shrivastava**