Abstracts

22 Evaluation of Scoring Systems in the Early Prediction of Outcomes in Acute Pancreatitis
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Introduction: Various classification and scoring systems have been proposed to predict severity and outcomes in acute pancreatitis (AP). However, each of these systems has shortcomings, and no single classification system has effectively predicted severity and outcomes. This study aims to compare the effectiveness of both past and current classification systems in predicting outcomes in AP including: Original Atlanta Criteria (OAC), Revised Atlanta Criteria (RAC), Determinant based classification (DBC), PNI, APACHE III, APACHE IV, RAC, and BISAP. The study also explored the impact of comorbidities on outcomes in AP. We studied 106,500 patients with AP included in the study, of which 1,361 (1.3%) had BS. The study was a retrospective cohort study comparing AP patients with GF <60 (stages 3, 4, ESRD) to matched subjects with GFR>60 (stages 1 and 2). Patient demographics, labs, severity of AP, and length of stay (LOS) were extracted from our single-center database of confirmed AP admissions. Dialysis records were obtained from GAIA Software, LLC for patients with stage 4 or ESRD organ failure, and length of stay (LOS) were extracted from our single-center database of confirmed AP admissions.

Results: A total of 106,500 patients with GFR <60 were included in the analysis, 57% of these were stage 3, 4% were stage 4 and 35% were dialysis dependent. Matched controls consisted of 67% stage 2 and 33% stage 1 CKD patients. There were no significant differences in any of the admission characteristics. Subjects with GFR <60 had significantly higher BUN levels and lower Hct levels compared to those with GFR >60. Subjects with GFR <60 were more likely to have moderately severe to severe pancreatitis compared to the GFR >60 group (33 vs 17, P = 0.004). In the GFR <60 group, BUN:20 at admission was not associated with severity; however, ADAM33 (BUN:20 vs moderate severe pancreatitis in subjects with GFR <60 (P = 0.007). In subjects with GFR <60, worse severity ratings and longer LOS were significantly more common in subjects with an upward trend in BUN in 24 hours (14 vs 19, P = 0.006; 5.0 vs 7.0, P = 0.008). Neither elevated hematocrit levels on admission nor trend upward trend in Hct were associated with severity or LOS in either group.

Conclusion: An upward trend in BUN at 24 hours may be a useful predictor of clinical severity in patients with CKD. Larger study populations and further investigation are needed to evaluate the link between these prognosticators and other severe outcomes such as pancreatic necrosis in the CKD population.

23 Severe Acute Pancreatitis and Shock: Are High Angiopoetin-2 Levels Causing Endothelial Cell Dysfunction and a Vascular Leak Syndrome?
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Introduction: Acute pancreatitis is an acute inflammatory syndrome originating in the pancreas with variable progression from injury, to local inflammation, to systemic inflammation to vascular leak syndrome and multi-organ dysfunction syndrome (MODS). Systemic inflammation, measured as the systemic inflammatory response syndrome (SIRS), appears to be necessary, but not sufficient to cause MODS. We previously demonstrated that angiopoietin-2 (Ang-2), an endothelial cell paracrine hormone associated with local vascular leak following injury, was significantly higher on admission in patients who developed persistent organ failure compared with those who did not (PMID: 20441065). This suggested that endothelial cell dysfunction linked SIRS with MODS via TLR via TNF-alpha and TNF- beta, respectively, as primary clinical signs. However, it was not clear whether Ang-2 was a consequence, or mediator of endothelial cell injury.

Methods: In a follow-up clinical study, clinical information and blood was collected from patients with severe AP at admission and for 7 days. Serum was assayed for Ang-2 levels (MSD). Human vascular endothelial cells were cultured and treated with serum from severe AP patients and synthetic Ang-2 (BARD Systems; concentrations of 1-50 micrograms/ml) to determine the effect on cell viability. These experiments were piloted to find the optimal dose, which was 50 micrograms/ml. Cell morphology and viability were measured by lactate dehydrogenase release assay, MTT dye, thioflavin staining. Capase 3/7 activation was also measured after 4 hours treatment.

Results: Ang-2 levels in patients were ranged from 3,000 to 260,000 pg/ml with normal values in our controls being <2,000 pg/ml. The addition of serum from patients with severe, but not mild AP induced in endothelial cell stress and death after 24 hour treatments. Synthetic Ang-2 began decreasing cell viability at concentrations of 5,000 pg/ml with IC50 of 42,500 pg/ml as measured by the MTT assay. Caspase 3/7 was not activated by Ang-2. Ang-2 alone did not appear to cause an endothelial stress response, or apoptosis.

Conclusion: This is the first study to demonstrate that Ang-2, in levels seen during severe AP in humans, result in endothelial cell death. These results provide insight into possible mechanisms of severe AP with VLS and prolonged recovery. The mechanism of cell death, and the potential contributions of other factors in this process are important for future development of effective interventions to prevent or limit MODS.

24 BUN and Hematocrit as Single-marker Prognosticators for Acute Pancreatitis in Chronic Kidney Disease Patients
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Introduction: Gallstone formation following rapid weight loss after bariatric surgery (BS) has been observed, with subsequent occurrence of acute cholangitis (AC). However, the complex post-surgical anatomy limits the possibility of performing an ERCP as part of AC treatment. Therefore, the purpose of this study was to assess the impact of biliary surgery on mortality and resource utilization among patients with AC using a national database.

Methods: A retrospective cohort study using the National Inpatient Sample 2004-2013, the largest publicly available inpatient database in the US. All patients with an ICD-9 CM code for a primary diagnosis of AC were included. There were no exclusion criteria. Patients with a past history of BS were identified using ICD-9 CM codes. BUN:20 was predictive of moderate to severe inpatient mortality. The secondary outcome was resource utilization: use of ERCP, cholecystectomy, length of hospital stay (LOS), total hospitalization charges and costs (adjusted for inflation). Multivariate regression analyses were used to adjust for the following confounders: Age, sex, race, income, patients’ zip code, Charlson Comorbidity Index, hospital region, location, size and teaching status.

Results: A total of 106,500 patients with AC were included in the study of which, 1,361 (1.3%) had BS. The mean patient age was 61 years and 49% were female. After adjusting for confounders, patients with and without history of bariatric surgery did not display a statistically significant difference in adjusted odds of mortality (OR: 0.55; 95% CI: 0.38-0.81, P=0.005). In terms of resource utilization, patients with bariatric surgery had an expectedly lower adjusted odds of ERCP (OR: 0.36; 95%CI: 0.23-0.52, P=0.01), but similar odds of cholecystectomy (OR: 1.45; 95%CI: 0.88-2.42, P=0.14). Both patient groups had similar LOS (adjusted mean difference: -0.33 days, 95% CI: -0.93-0.26, P=0.27), total hospitalization costs (adjusted mean difference: -$692, 95% CI: -$2512 - $1128, P=0.46), and charges (adjusted mean difference: -$2865, 95%CI: -$9472 - $3874, P=0.46).

Conclusion: A history of bariatric surgery was not associated with different odds of inpatient all-cause mortality among patients who develop acute cholangitis, despite its association gallstone acute pancreatitis and limited ERCP performance. In addition, bariatric surgery does not affect resource utilization in this patient population as measured by length of stay and total hospitalization costs and charges.

25 Adjusted means and odds ratio of evaluated parameters in patients with cholangitis that had a past surgical history of bariatric surgery, compared to patients with no history of bariatric surgery

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Adjusted Odds Ratio</th>
<th>95% Confidence Interval</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality</td>
<td>0.56</td>
<td>0.08-3.91</td>
<td>0.55</td>
</tr>
<tr>
<td>Shock</td>
<td>1.90</td>
<td>0.68-5.28</td>
<td>0.22</td>
</tr>
<tr>
<td>ICU</td>
<td>0.80</td>
<td>0.19-3.31</td>
<td>0.76</td>
</tr>
<tr>
<td>Multi-Organ Failure</td>
<td>1.18</td>
<td>0.63-2.02</td>
<td>0.55</td>
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<tr>
<td>TPN</td>
<td>2.22</td>
<td>1.06-4.66</td>
<td>0.03</td>
</tr>
<tr>
<td>ERCP</td>
<td>0.36</td>
<td>0.25-0.52</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>1.45</td>
<td>0.88-2.42</td>
<td>0.15</td>
</tr>
</tbody>
</table>

26 Pancreatic Duct Stents Without Internal Flaps Spontaneously Migrate in Most Patients When Inserted for Prevention of Post-ERCP Pancreatitis
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Introduction: Pancreatic duct (PD) stents are often placed for the prevention of post-ERCP pancreatitis (PEP) in high-risk individuals. Stent insertion within the main PD frequently mandates a 2nd procedure

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[26] Dislodged pancreatic duct stent at the splenic flexure.

for stent removal within 2-4 weeks. More recently, PD stents without internal anti-migration flaps have been utilized to allow for spontaneous migration, thus obviating the need for a repeat procedure. Newly developed single-pigtail PD stents without internal flaps have been designed with radiopaque markers, in order to easily document spontaneous passage with a simple XRAY. The aim of this study was to systematically evaluate the spontaneous migration rate of the new Advarix PD stent (external pigtail, no internal flap, single radiopaque marker) when inserted for the prevention of PEP. Secondary aims were to insert technical feasibility of stent insertion, and overall safety of the stent.

Methods: This was a retrospective analysis of consecutive patients undergoing ERCP between February 2015 and April 2017 who had the Advarix PD stent inserted to prevent PEP. All patients were ordered to undergo abdominal XRAY at 2 weeks following insertion. The presence or absence of the PD stent on follow-up XRAY imaging was recorded.

Results: Fifty-three PD stents were placed in 53 patients. Technical success rate of stent insertion was 98.1% (52/53). Median stent length was 3 cm (range, 3-5 cm); and median stent diameter was 5 Fr (range, 4-5 Fr). Overall, 42/52 stents (80.7%) spontaneously migrated, 35/42 confirmed by XRAY, and 7/42 confirmed by alternative imaging prior to XRAY (CT, MRI, endoscopy). In the remaining 10 patients, 2 had their stents removed endoscopically before 2 weeks, and 8 were lost to follow-up. Of those that spontaneously migrated, 19/42 (45.2%) migrated by 2 weeks, 36/42 (85.7%) by 6 weeks, and 48/42 (95.2%) by 3 months. Eighteen patients had a biliary stent positioned adjacent to the PD stent, 77.8% of these patients (14/18) had spontaneous stent migration, 2/18 had their stents removed endoscopically, and 2 were lost to follow-up. There were no cases of inward stent migration or ductal perforation. Four of 53 patients (7.5%) developed PEP. All were given rectal indomethacin during ERCP.

Conclusion: Small-size, single-pigtail PD stents without internal flaps appear to migrate spontaneously, as desired, within 4 weeks after insertion in the majority of cases. Even when placed next to a biliary stent, spontaneous PD stent migration seems likely.

Risk Factors for 30-Day Readmission for Pancreatitis in the National Readmission Database (NRD)

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Introduction: Thirty-day readmissions have become a focus for cost reduction for select clinical conditions. In addition, early readmission has been identified as an independent risk factor for mortality in acute pancreatitis. Our aim was to utilize the novel National Readmission Database (NRD) to determine the risk factors for 30-day readmission in patients with pancreatitis and evaluate the predictive ability of the created model.

Methods: We utilized the Healthcare Cost and Utilization Projects (HCUP) 2013 and 2014 NRD. Index admissions had either a primary or secondary diagnosis of pancreatitis (ICD-9: 577.57, 577.0). Patients with an index admission death and those with an index admission in the month of December were excluded. The primary outcome of interest was risk factors for 30-day readmission. Data was analyzed using Student’s t-test and stepwise, backward multivariate logistic regression analysis.

Results: We identified 98,641 (2013) and 98,579 (2014) index admissions with pancreatitis. The average patient age was 52.3 years with an average of 4.5 chronic conditions per patient in the combined data set. The average length of stay (LOS) of the index hospitalization was 4.8 days and average cost was $40167.76. Utilizing the 2013 data set, within 30 days, 11,659 (12.5%) readmissions occurred.

Conclusion: Utilizing a cross-sectionally nationally available dataset we were able to identify plausible readmission risk factors among patients with pancreatitis that is replicated across data sets. However, the predictive ability of the final model limits the application of the model and dataset. Further study utilizing factors outside of discharge diagnosis codes is required in order to create validated predictive models.

Outcomes in Intra-ductal Papillary Mucinous Neoplasms in the New York Harbor Veteran Population

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Introduction: Intra-ductal papillary mucinous neoplasms (IPMNs) have become more frequently and incidentally diagnosed in recent years due to increases in imaging procedures. With recommendations based on weak evidence, the only consistent recommendation is for surgical intervention in patients with main duct lesions, branch duct lesions greater than 3 cm, or a solid component of the cyst. The intent of our study is to evaluate the natural history of incidental pancreatic cysts and to determine if these lesions have an effect on morbidity and mortality.

Methods: Retrospective chart review was performed on patients with diagnosis of pancreatic cyst, pancreatic lesion, and intra-ductal pancreatic mucinous neoplasm from the New York Harbor Veterans Affairs Hospital from 2000 to 2015. Of 767 patients, 116 were randomly selected for further analysis. Charts were reviewed for outcomes which included progression of IPMN into disease or death of patient from pancreatic or other causes.

Results: Of the 116 patients with pancreatic cysts, 47 patients were diagnosed with IPMN. Baseline characteristics are outlined in Table 1. In summary, all patients were male, more than half of patients were over age 70 at diagnosis and more than half had BMI greater than 25. There were few Hispanic (7%) or Asian (6%) patients, with most patients self-identifying as white (42.6%) or black (40.4%). In terms of patient outcomes (Table 2), only 4 of 47 patients had passed away at time of publication, with 3 passing from a pancreatic etiology, 2 being pancreatic cancers. Only 17 (36.2%) patients underwent EUS to further evaluate the cysts and 4 of these 17 had FNA sampling of the cyst. Of 47 patients, 4 underwent surgical removal of pancreatic lesions and all 4 pathology samples showed IPMN without malignancy.

Conclusion: Currently, management of IPMNs is based on consensus rather than strong evidence. This study preliminarily supports the evolution of management to conservatively observing these lesions. However, as with many published studies on IPMNs, this study has limitations such as advanced age, all male sample and multiple comorbidities preventing further invasive interventions. Because of this, our findings cannot be applied to the general population. Therefore we recommend further larger multicenter trials to establish the risk of IPMNs developing into pancreatic cancer, specifically in the aging population.