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chronic pancreatitis.

OC-16.
The genetic risk factor CEL-HYB causes chronic pancreatitis in mice

K Field1, A. Gravdal2,3, H.N. Pettersen1,2,3, C.S. Verheke4,5, M.H. Solheim4, K. El Jellas1,2, J. Alam1, S.J. Steine1, B.B. Johansson1, P.R. Njølstad1,2, X. Xiao1, M.E. Lowe1, A. Molven1,6

1 The Gade Laboratory for Pathology, Department of Clinical Medicine, University of Bergen, Bergen, NORWAY
2 Center for Diabetes Research, Department of Clinical Science, University of Bergen, Bergen, NORWAY
3 Department of Medical Genetics, Haukeland University Hospital, Bergen, NORWAY
4 Department of Pathology, Oslo University Hospital Rikshospitalet, Oslo, NORWAY
5 Department of Pathology, Institute of Clinical Medicine, University of Oslo, Oslo, NORWAY
6 Department of Pediatrics and Adolescent Medicine, Haukeland University Hospital, Bergen, NORWAY
7 Department of Pediatrics, Washington University School of Medicine, St. Louis, MO, USA
8 Department of Pathology, Haukeland University Hospital, Bergen, NORWAY

Introduction: The CEL gene encodes the digestive enzyme carboxyl ester lipase. Our research group has discovered that CEL-HYB, a hybrid allele variant of CEL and its adjacent pseudogene CELP, increases the risk of developing chronic pancreatitis (CP) by five-fold. Cellular studies indicate that the disease mechanism is linked to protein misfolding and aggregation, and increased endoplasmic reticulum (ER) stress.

Aims: The aim of this study was to develop a mouse model for CEL-HYB-associated CP that would enable us to study the disease mechanism at the organ level.

Materials and Methods: We established a knock-in CEL-HYB mouse where the variable number of tandem repeat (VNTR) region of the endogenous mouse cel gene was substituted with the mutated VNTR of the human CEL-HYB gene. Heterozygous and homozygous CEL-HYB mice were characterized with respect to growth, development, pancreas pathology and CEL protein expression.

Results: In both heterozygous and homozygous CEL-HYB mice aged 6 months, we observed features of chronic pancreatitis including progressive acinar cell atrophy, inflammation, fibrosis and pancreatic fat infiltration. The same features, but more pronounced, were observed in 12-month-old animals. Immunostaining of pancreatic tissue indicated CEL protein aggregates. Moreover, electron microscopy showed dilated ER in the acinar cells of CEL-HYB mice. Wildtype C57BL/6N littermates exhibited no signs of pancreatic disease.

Conclusion: We have developed a new genetic mouse model for CP. The model will be used for further studies of the pathogenic mechanism of CEL-HYB, and might be particularly relevant for testing the interactions of environmental CP risk factors with a well-established genetic factor.

OC-17.
SARS-COV-2 infection in acute pancreatitis increases disease severity and 30 day mortality: Results of the COVID pan collaborative study

C. Mohammadi-Zanjani, S. Tingle, F. Abbadesa, J. Moir, M. Nayar, S. Pandanaboyana

HPB Unit, Freeman Hospital, Newcastle Upon Tyne, UNITED KINGDOM

Introduction: There is emerging evidence that the pancreas may be a target organ of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) infection.

Aims: This aim of this study was to investigate the outcome of patients with acute pancreatitis (AP) and co existent SARS-CoV-2 infection.

Materials and Methods: A prospective international multicenter cohort study including consecutive patients admitted with AP during the current pandemic was undertaken. Primary outcome measure was severity of AP. Secondary outcome measures were aetiology of AP, intensive care unit (ICU) admission, length of hospital stay, local complications, acute respiratory distress syndrome (ARDS), persistent organ failure and 30-day mortality. Multilevel logistic regression was used to compare the two groups.

Results: 1777 patients with AP were included during the study period from 1st March to 23rd July 2020. 149 patients (8.3%) had concomitant SARS-CoV-2 infection. Overall, SARS-CoV-2 positive patients were older, male patients and more likely to develop severe AP and ARDS (p<0.001). Unadjusted analysis showed that SARS-CoV-2 positive patients with AP were more likely to require ICU admission [Odds ratio (OR) 5.21, p<0.001], local complications [OR 2.91, p<0.001], persistent organ failure [OR 7.32, p<0.001], prolonged hospital stay [OR 1.89, p<0.001] and a higher 30-day mortality [OR 6.56, p<0.001]. Adjusted analysis showed length of stay [OR 1.32, p<0.001], persistent organ failure [OR 2.77, p<0.003] and 30-day mortality [OR 2.41, p<0.04] were significantly higher in SARS-CoV-2 co-infection.

Conclusion: Patients with AP and coexistent SARS-CoV-2 infection are at increased risk of severe AP, persistent organ failure, prolonged length of hospital stay and high 30-day mortality.

OC-18.
How to predict microlithiasis in idiopathic pancreatitis – A machine learning derived tool

M. Zorniak, S. Sirtl, E. Hochmann, J. Mayerle, U.M. Mahajan

Ludwig-Maximillian University - Department of Medicine II, Munich, GERMANY

Introduction: After a thorough clinical workup the etiology of acute pancreatitis can be established in the majority of patients, but in up to 10-30% cases it remains elusive. The co-incident microlithiasis detection rate in patients with acute idiopathic pancreatitis is reported to be up to 75%. The clinical consequences of microlithiasis are difficult to evaluate as prospective studies on microlithiasis are lacking. Furthermore, a non-invasive prediction tool to select patients with idiopathic pancreatitis for further workup is missing.

Aims: To develop a machine learning aided non-invasive prediction tool to guide the clinician in the patients selection for EUS in idiopathic pancreatitis.

Materials and Methods: Retrospective single-center analysis of routinely recorded clinical and laboratory parameters of 1090 patients with confirmed acute pancreatitis and hospitalization within the period from 01.01.2016-01.10.2020. Patients who did not receive endosonography as part of the diagnostic work-up and whose pancreatitis episode could be adequately explained by other causes than microlithiasis were excluded. We trained linear and non-linear machine learning classifiers using H2O.ai automatically selecting the best suitable machine learning method on the training set, to predict microlithiasis.

Results: 16 categorized patient variables recorded at admission were identified to compute the predictor model with a mean area under the curve (AUC) of 0.91±0.01 and with a PPV of 0.93 in the test cohort. PIT ratio, GFR, TSH, age, triglycerides and GPLT/ALT were identified as important variables to identify cases with microlithiasis.

Conclusion: We present a robust machine-learning based predictor consisting of routinely recorded parameters at admission that can predict microlithiasis as cause of pancreatitis.