Investigator: Murli Manohar Pediatric Gastroenterology

Title: Potential Diagnostic Biomarkers for Pancreatitis

Summary:
The Data Studio Workshop brings together a biomedical investigator with a group of experts for an in-depth session to solicit advice about statistical and study design issues that arise while planning or conducting a research project. This week, the investigator(s) will discuss the following project with the group.

Pancreatitis is characterized by elevated level of digestive enzymes leading to dysfunction of the pancreas and distal organ systems with high mortality. During pancreatic inflammation, metabolic abnormalities were reported in experimental models of acute pancreatitis (AP), recurrent AP (RAP), chronic pancreatitis (CP), and in human mild AP. However, global changes in metabolic flux remain to be evaluated during pancreatitis onset and progression to uncover potential less invasive biomarkers for early diagnosis and monitoring.

We performed a pilot study by conducting an untargeted metabolomic analysis on plasma samples collected from healthy individuals (n=10), AP (n=10), RAP (n=10) and CP (n=10) using GCTOF, LCQTOF, and HILIC platforms. Untargeted metabolic analysis has 440 primary metabolites (128 known), 2732 lipids (498 known) and 1182 biogenic amine (261 known) in the plasma samples of healthy individuals (HL) and pancreatitis patients (AP, RAP, CP). We applied a type of enrichment analysis called ChemRICH cluster plot analysis for all pancreatitis versus healthy individuals and identified 25 significantly altered clusters.

Overall, this analysis indicates significant metabolism fluctuations during pancreatitis onset and progression which offer potential less invasive biomarkers that can be used to diagnose and monitor disease progression. We need to validate these findings in a separate validation cohort.

Questions:
Our questions concern the validation cohort.

1. How do we allocate samples among the four subgroups (HL, AP, RAP, CP) in the validation cohort?

2. What is the appropriate power analysis?
Zoom Meeting Information

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