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P-037

DEVELOPMENT OF A PROTEOMIC BIOMARKER SIGNATURE FOR IDENTIFYING INTRACRANIAL ANEURYSMS

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Introduction Intracranial aneurysms occur in approximately 1–2% of the general population and are the leading cause for subarachnoid hemorrhage (SAH). Recent studies have shown the utility of using multiplex immunoassays in biomarker discovery for a variety of diseases. Although a number of biomarkers have been identified to be related to intracranial aneurysms, a proteomic signature has not been defined to predict the presence of an intracranial aneurysm. In this study, we utilized proteomic data from patients with known intracranial aneurysms and healthy controls to identify a proteomic signature in the serum to predict the presence of an aneurysm.

Methods Fifty-six patients were prospectively enrolled in this study, 28 of which with unruptured intracranial aneurysms and 28 sex, age, and comorbidity matched healthy controls. Serum was collected from each patient. Protein expression levels were determined using the Proseek multiplex immunoassay (<http://www.olink.com/>), which included 92 known inflammatory markers. Univariate and multivariate logistic regression models were constructed and systematically assessed using statistical and biological inferences to identify phenotypic and proteomic variables that significantly predicted presence of an aneurysm.

Results Of the 28 patients with intracranial aneurysms, 82.1% (n=23) were female, 46.4% (n=13) were never smokers, 35.7% (n=10) were former smokers, and 17.9% (n=5) were current smokers. Healthy controls were matched on a 1:1 basis, with age \pm 5 years. In the patient cohort the mean aneurysm size was 8.9 mm with the most common location being anterior communicating artery (35.7%, n=10). Upon univariate analysis, increased expression of 10 analytes were found to be independent predictors of the presence of an intracranial aneurysm. At the univariate level, IL17 (OR=12.01; 95% CI 4.16 – 53.17; p<0.00001) and CD244 (OR=34.19; 95% CI 6.14 – 344.81; p=0.000531) were found to be the most predictive. At the multivariate level, while controlling for age, sex, hypertension, and smoking status, IL17 remained a significant predictor of the presence of an intracranial aneurysm (OR=32.70, 95% CI 4.64 – 778.81; p=0.00485).

Conclusion This study leveraged individualized data from patients with intracranial aneurysms to determine which proteomic variables predict the presence of an intracranial aneurysm while controlling for essential clinical covariates. Larger multi-omic studies are warranted to develop a more comprehensive biomarker signature for intracranial aneurysms.

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P-038

PREDICTORS OF VENTRICULOSTOMY INFECTION IN A LARGE COHORT

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Background External ventricular drain (EVD) placement is a common neurosurgical procedure. While this procedure is simple and effective, infection is a major limiting factor. Factors predictive of infection reported in the literature are not conclusive.

Objective The aim of this retrospective single-center large sample was to assess the rate and factors predictive of infection.

Methods We performed a retrospective review of patients who underwent EVD placement between January 2012 and January 2018.

Results A total of 714 patients were included in the study. The infection rate was 3.6% (26/714). In 45% of the cases, the indication for ventriculostomy placement was for acute subarachnoid hemorrhage (aSAH) or intracerebral hemorrhage (ICH). Of the factors that were an independently significant predictor of ventriculostomy-associated infection (VAI) was the placement of a second EVD; the likelihood was eight times higher than if only a single EVD was placed (OR: 7.95, 95% CI: 1.01–62.9, p<0.05). Another factor was routine CSF sampling, associated with greater than nine times higher likelihood of VAI compared to no routine CSF sampling (OR: 9.20, 95% CI: 1.93–43.9, p<0.01). Intrathecal (IT) drug deliveries were also associated with a higher likelihood of VAI (OR: 55.7, 95%CI: 2.92-

1060, p<0.01). Non-significant factors were day vs. night, location (ICU/ER vs. OR), duration, CSF leak, suture type, system flushing.

Conclusion Our study shows that the rate of VAI was 3.6%. Only three variables were significant independent predictors of VAI; these were the replacement of the EVD, routine CSF aspiration, and intrathecal drug delivery.

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P-039

INTRAVASCULAR ULTRASOUND OF FLOW DIVERTERS IN ANEURYSM TREATMENT

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Introduction/Purpose The use of flow diverting stents for the treatment of cerebral aneurysms has significantly increased since the PUFs (Pipeline for Uncoilable or Failed Aneurysms)