

Background: Circulating miRNAs are emerging as a prominent class of biomarkers in many diseases. Previous studies reported differential expression patterns of certain miRNAs in venous thromboembolism (VTE). In these reports, differentially expressed miRNAs could be a consequence of the disease rather than a cause. No study has prospectively evaluated the association between the expression of plasma miRNAs and risk of future VTE.

Aims: To investigate whether plasma levels of miRNAs are differentially expressed in subjects with and without incident VTE during follow-up.

Methods: We conducted a pilot nested case-control study including 19 subjects who developed VTE within 3 years after blood sampling and 19 age- and sex-matched healthy controls recruited from the general population (Tromsø VI survey). Total RNA was extracted from plasma using the miRNeasy Mini kit (Qiagen, USA) with modifications. Screening of 179 miRNAs was performed on a Serum/Plasma Focus microRNA PCR panel (Exiqon, Denmark). miRNAs expression levels were normalized by the expression of miR-425-5p as suggested by BestRef. Statistical analyses were performed in R software (v3.2.3). We used logistic regression with backward selection to build a predictive model of incident VTE. The study was approved by the regional ethical committee and all participants gave their informed written consent.

Results: High quality signals from 61 miRNAs were identified in all 38 plasma samples. Plasma levels of nine miRNAs, namely, miR-328-3p, miR-208a-3p, miR-629-5p, miR-15a-5p, miR-451a, miR-199a-3p, miR-363-3p, miR-20b-5p, miR-223-5p were found to be associated with future risk of incident VTE.

Conclusions: In this pilot nested case-control study, we found nine plasma miRNAs that could be important markers of future risk of incident VTE in the general population. Currently, these miRNAs are included in a larger-scale validation study.

PB 1415 | The Blood Components Strongly Affect Thrombus Structure Formed in a Novel Microfluidic Device

N. Sugita¹, H. Hirakata², K. Inoue², K. Tatsumi³, S. Ii⁴, H. Niioka⁴, S. Wada⁴, K. Koike²

¹Kyoto University Hospital, Psychiatry, Kyoto City, Japan, ²Kyoto University Hospital, Emergency Medicine, Kyoto City, Japan, ³Kyoto University, Engineering, Kyoto City, Japan, ⁴Osaka University, Mechanical Science and Bioengineering, Toyonaka, Japan

Background: Venous thromboembolism (VTE) is a major cause of sudden death. Prevention is still hard for lacking understanding of mechanical property of thrombus, that should be important because fatal VTE is caused by breakdown of thrombus. We reported that shear rate strongly affects thrombus structures in the ISTH SSC 2016 Meeting (BR06). In this study, we tried to clarify the effect of some kinds of blood cell on thrombus structure.

Aims: Our aim is to extract mechanical property of venous thrombus to predict the breakdown of venous thrombus preemptively, using multiscale mechanics simulation model and mathematical model of biological structure.

Methods: Human venous blood was obtained from healthy volunteers. We separated red blood cells (RBCs), washed platelets and platelet free plasma by centrifugation. We mixed them with various ratios of platelets or RBCs. Plasma was fluorescently-stained with FITC-conjugated dextran to visualize RBCs. Platelets were fluorescently-stained with quinacrine. Alexa fluor 546-conjugated fibrinogen was added to visualize fibrin formation.

The blood sample was introduced to a home build microfluidic channels that were fully siliconized and partly coated with collagen. The thrombus imaged was observed by a fluorescence microscope.

Results: The structures of thrombus with various ratios of blood components were much different from each other.

1. Thrombus formed by platelet poor blood traps more RBCs compared with control.
2. Fibrin fibers of thrombus formed using very low hematocrit blood appeared to anisotropic in orientation and also fibers are thinner and unclear than control.
3. The size of platelet clusters adhered on collagen surface formed by very low hematocrit blood is much bigger compared with that of normal hematocrit blood.

Conclusions: RBCs and platelets play pivotal roles to determine thrombus structure. Our findings are very informative to construct mathematical model of venous thrombus to elucidate mechanical property of thrombus in various conditions.

PB 1416 | D-dimer in Acute Medically Ill Adults: A Multicenter Observational Study Evaluating the Prevalence of Elevated D-dimer in Acute Medically Ill, Hospitalized Adults: The DAMIACT Study, Initial Results

C.L. Clark¹, A.H. Shams¹, W.F. Peacock², G.J. Fermann³, B. Kea⁴, A.M. Chang⁵, S.E. Mace⁶, B.C. Hiestand⁷, J.A. Welker⁸, R.A. Swor¹, K.N. Sawyer^{1,9}, A. Bastani¹⁰, on behalf of the DAMIACT Study Investigators

¹Beaumont Health System-Royal Oak, Emergency Medicine, Royal Oak, United States, ²Baylor College of Medicine/Texas Childrens Hospital, Emergency Medicine, Houston, United States, ³University of Cincinnati, Emergency Medicine, Cincinnati, United States, ⁴Oregon Health and Science University School of Medicine, Emergency Medicine, Portland, United States, ⁵Thomas Jefferson University, Emergency Medicine, Philadelphia, United States, ⁶Cleveland Clinic, Emergency Medicine, Cleveland, United States, ⁷Wake Forest School of Medicine, Emergency Medicine, Winston-Salem, United States, ⁸Anne Arundel Health System, Internal Medicine, Baltimore, United States, ⁹University of Pittsburgh, Emergency Medicine, Pittsburgh, United States, ¹⁰Beaumont Health System-Troy, Emergency Medicine, Troy, United States