9.02 Calibrated automated thrombography demonstrates a hypocoagulable profile in subjects with pulmonary arterial hypertension

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There is considerable interest in the role of platelets and blood coagulation in the pathobiology of pulmonary arterial hypertension (PAH). The aim of this study is to characterise thrombin generation in PAH using calibrated automated thrombography (CAT). Institutional ethical approval was granted. Thrombin generation using CAT was performed using a Fluoroskan Ascent® Plate Reader and Thrombinoscope™ software.In the period between July 2020 and July 2022, 20 individuals with PAH and 20 healthy volunteers were recruited to this study. Platelet counts were significantly lower in individuals with PAH relative to healthy controls (p=0.0053). Mean platelet volume was significantly higher in PAH subjects at 10.8 fL versus 8.2 fL (p=0.0001) respectively. CAT parameters also differed between groups, as individuals with PAH had significantly lower endogenous thrombin potential, peak thrombin generation and thrombin generation velocity index in both platelet-rich and platelet-poor plasma, suggesting a hypocoagulable profile (**Table 1**).This data demonstrated a hypocoagulable profile in subjects with PAH. This may represent an 'exhaustion effect' of coagulation factors due to sustained and prolonged activation of the procoagulant pathways in the pulmonary circulation. The clinical implications of these results are immensely relevant and support the shift away from empiric anticoagulation in this population.

Table 1(9.2): Calibrated automated thrombography in pulmonary arterial hypertension

	PAH subjects (n=20)	***Healthy Volunteers (n=20)***	***P-value***
Laboratory parameters, mean (SD)			
Haemoglobin (g/dL)	15.0 ± 1.6	13.9 ± 1.2	**0.0186**
Platelet count (x10^9/L)	210.9 ± 64.6	265.2 ± 49.9	**0.0053**
Mean Platelet volume (fL)	10.8 ± 1.0	8.2 ± 1.5	**0.0001**
Prothrombin time (s)	12.1 ± 1.5	---	---
APTT (s)	31.8 ± 5.3	---	---
Fibrinogen(mg/dl)	3.0 ± 0.7	---	---
D Dimer(mg/L), median (IQR)	0.7 (1.5)*	---	---
Calibrated automated thrombography			
Platelet-rich plasma			
Lag time (min)	7.0 ± 2.8	7.1 ± 1.8	0.8938
*Endogenous thrombin potential (nm*mins)*	1325.3 ± 341.3	2008.4 ± 796.6	**0.0011**
Peak thrombin (nm)	90.9 ± 24.8	166.7 ± 72.2	**0.0001**
Thrombin generation VI (nm per mins)	10.8 ± 5.1	23.2 ± 16.7	**0.0030**
Platelet-poor plasma			
Lag time (min)	3.7 ± 3.4	4.4 ± 2.4	0.4566
*Endogenous thrombin potential (nm*mins)*	1336.3 ± 374.9	1720.1 ± 535.6	**0.0124**
Peak thrombin (nm)	195.2 ± 53.4	261.5 ± 92.1	**0.0083**
Thrombin generation VI (nm per mins)	51.9 ± 19.5	83.5 ± 52.6	**0.0161**

Table 1 Provides an overview of laboratory parameters and thrombin generation characteristics in platelet-rich plasma and platelet-poor plasma in subjects with pulmonary arterial hypertension (PAH) and healthy controls. Values are expressed as mean ± standard deviation unless otherwise specified. *Median (Interquartile range). *Abbreviations: APPT: Activated partial thromboplastin time; VI: Velocity index.*

References:

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Conflict of Interest: *None to declare*