

HYPERTENSION

Abstracts 71 — 78

Moderators: Donna Johnson, MD; George Saade, MD

71 Significant differences in dynamic platelet behavior in gestational hypertension and preeclampsia compared with intrauterine growth restriction suggesting alternate pathways in utero-placental disease

Sieglinde Müllers¹, Jonathan Cowman³, Naomi Burke¹, Aoife Murray¹, Karen Flood¹, Elizabeth Tully¹, Hugh O'Connor¹, Mark Dempsey¹, Patrick Dicker⁴, Michael Geary², Dermot Kenny³, Fergal Malone¹

¹Royal College of Surgeons in Ireland/Rotunda Hospital, Obstetrics and Gynecology, Dublin, Ireland, ²Rotunda Hospital, Obstetrics and Gynecology, Dublin, Ireland, ³Royal College of Surgeons in Ireland, Clinical Research Centre, Dublin, Ireland, ⁴Royal College of Surgeons in Ireland, Epidemiology and Public Health, Dublin, Ireland

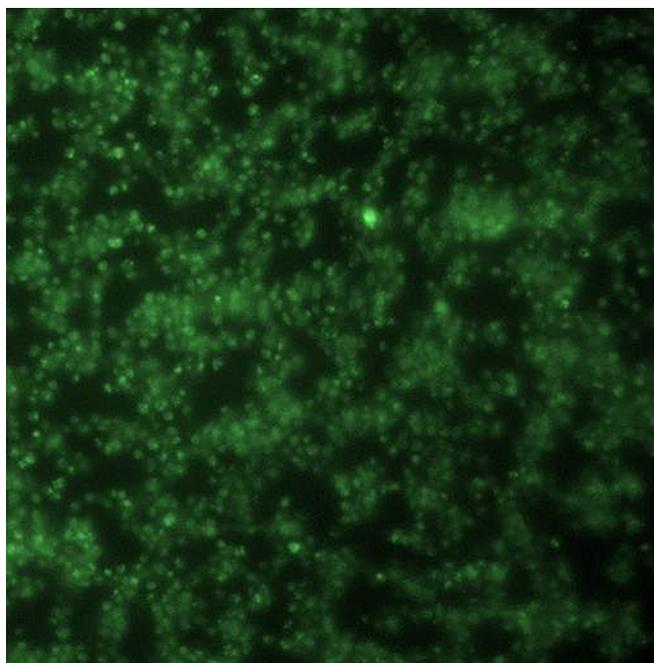
OBJECTIVE: Platelet mediated thrombosis occurs when platelets tether adhere and roll on Von Willebrand factor (vWF). We developed a novel microfluidic assay that measures these parameters thus replicating the behavior of platelets in vasculature. Using this dynamic assay of platelet function we investigated patients with preeclampsia (PET), gestational hypertension (GH) & intrauterine growth restriction (IUGR) which has never been shown to date.

STUDY DESIGN: Patients were recruited from 24wks gestation. 100ul of blood from each donor was fluorescently-labeled and perfused over a vWF coated polymer chip at arterial shear conditions. Images of platelet interactions at the surface were captured using a vacuum-cooled Andor camera. Multiple parameters of platelet behavior were assessed in each condition and all samples had a triplicate run performed.

RESULTS: 28 samples comprising of GH (n=10), PET (n=12) and IUGR (n=6) were obtained and were compared to 13 normal pregnant controls. In GH platelets demonstrated less stasis, less translocation, and less end-surface coverage compared with healthy controls (p<0.0001) with similar findings in PET. However, in IUGR platelets demonstrated more stasis, equal translocation and less surface coverage (p= 0.0001), see table.

CONCLUSION: Our novel findings show significant differences of in vivo platelet behavior in pregnancies with GH and PET in contrast to IUGR, when compared to healthy pregnant controls. In GH and PET platelets appear less reactive to the vWF surface demonstrating global hypo-reactivity. In IUGR platelets are more static suggesting a tendency to micro-thrombus formation. For the first time we have demonstrated real-time platelet activity in common pregnancy disorders. These results may challenge the theory of a homogenous pathological pathway in utero-placental disease leading to more advanced targeted platelet therapies for these conditions in the future.

Dynamic platelet assay demonstrating platelets immobilized on a surface of Von Willebrand factor



Multiple parameters of platelet function for controls, GH, PET and IUGR

	Control (n=13)	IUGR (n=6)	P value	PET (n=12)	P value	GH (n=10)	P value
Nstatic	24 +/- 12	33 +/- 11	0.016	29 +/- 23	0.33	18 +/- 11	0.02
Ntrans	211 +/- 75	216 +/- 79	0.82	185 +/- 48	0.03	164 +/- 48	0.001
%Motion	3.55 +/- 1.12	4.4 +/- 1.92	0.13	3.91 +/- 1.47	0.06	3.09 +/- 0.84	0.07
%Surface	5.97 +/- 1.5	5.17 +/- 1.83	<0.0001	5.47 +/- 1.34	0.28	4.65 +/- 0.84	0.0001

Nstatic, platelets that have not traveled more than 1.5 times their radius from the start to end of the flow run; *Ntrans*, are platelets that have traveled more than 1.5 times their radius from the start to end of the flow run; *%Motion*, the percentage of time that a platelet spends moving before stably adhering to the vWF surface; *%Surface coverage end*, the percentage of platelets (*Nstatic* and *Ntrans*) captured in the final image in comparison to the background.

72 10:12 Conjugated linoleic acid (CLA) isomer rescues HUVEC cell dysfunction in a preeclamptic in-vitro model

Nauman Khurshid¹, Derek Boeldt², Amanda Hanks², Jennifer Krupp³, Dinesh Shah¹, Ian Bird¹

¹University of Wisconsin School of Medicine and Public Health, Dept. of OB/GYN, Maternal-Fetal Medicine, Madison, WI, ²University of Wisconsin School of Medicine and Public Health, Dept of OB/GYN, Perinatal Research Branch, Madison, WI, ³University of Iowa, Dept. of OB/GYN, Maternal Fetal Medicine, Iowa, IA