

# Haemostatic Variations in Normal Women: The Role of Electronic Bleeding Questionnaire, Electronic PBAC and a Global Haemostatic Assay in Predicting MBD

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## Background

Bleeding disorders that result in residual functional activity can exhibit a wide spectrum of clinical phenotypes and are known as mild bleeding disorders. Of this category, Von Willebrand disease is the most common, followed by platelet function defects. Mild Bleeding Disorders pose diagnostic challenges for both physicians and specialists. Menorrhagia is the most common presenting symptom of Mild Bleeding Disorders in women. Menorrhagia is defined as blood loss greater than 80mL. A semi-quantitative method that is widely accepted is the Pictorial Blood Assessment Chart, or PBAC, where sanitary material are assigned a numerical value based upon the degree of saturation to measure menstrual blood loss. A PBAC score of >100 = >80mL of menstrual blood loss. In the absence of gynaecological causes, menorrhagia can reflect the presence of a haemostatic disorder. It is important to objectively evaluate menstrual blood loss. General bleeding symptoms can be evaluated using a bleeding questionnaire. One of the recently published questionnaires has been validated for diagnosis of VWD in 2008 by a Canadian group. However, it is paper based and takes 20 minutes.

## Objective

To investigate tools that can assist in determining Mild Bleeding Disorders in seemingly normal women.

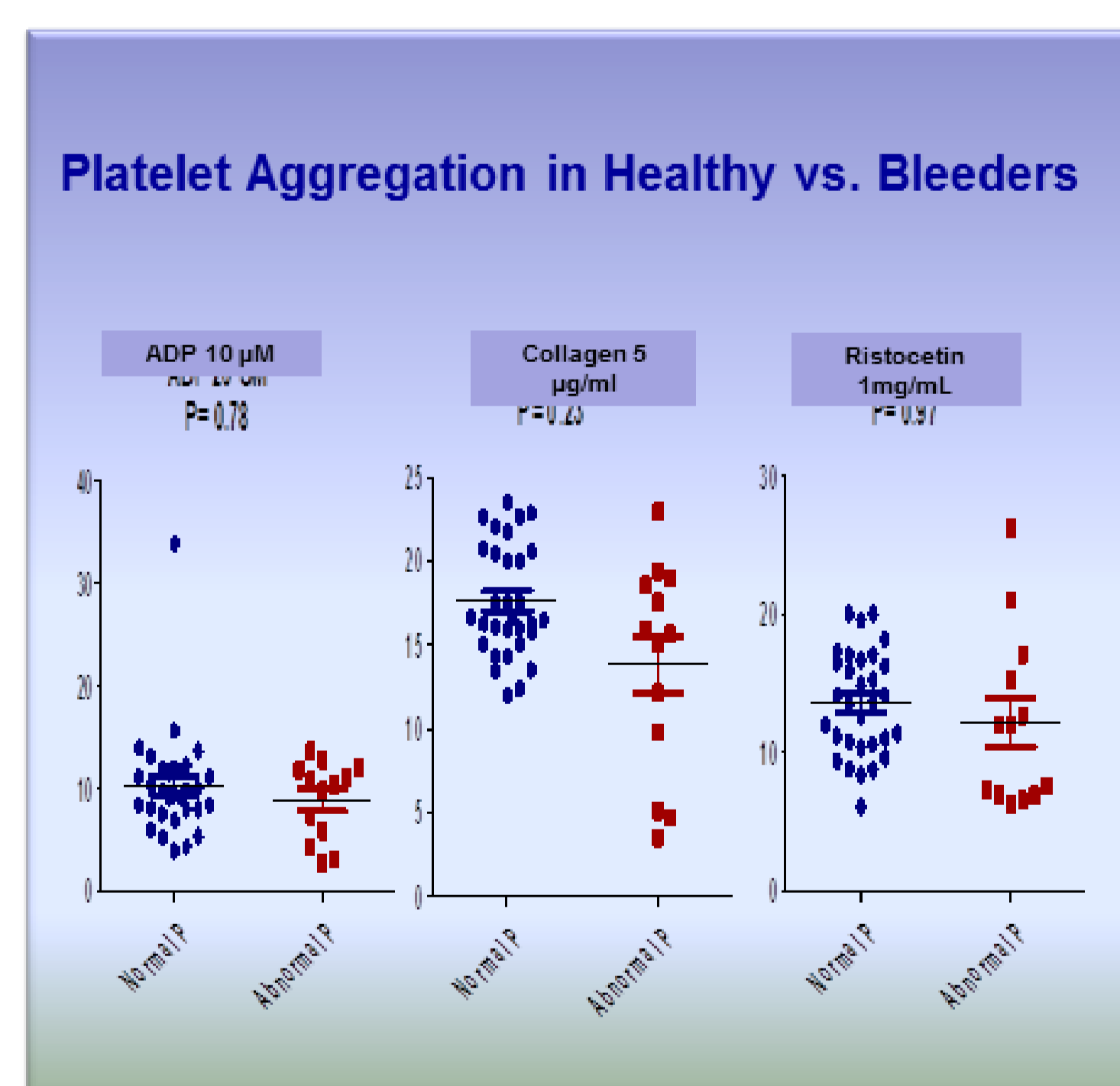
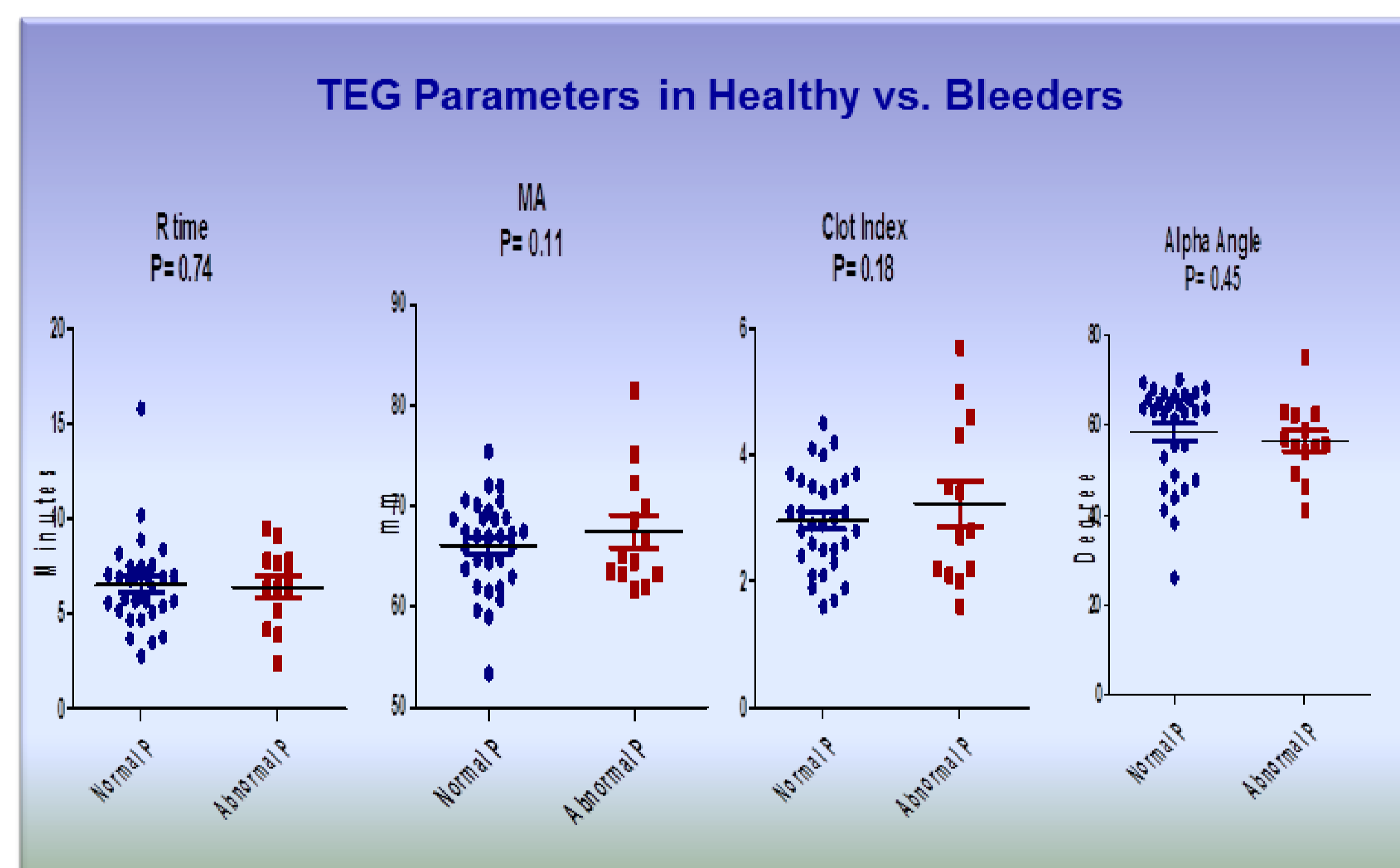
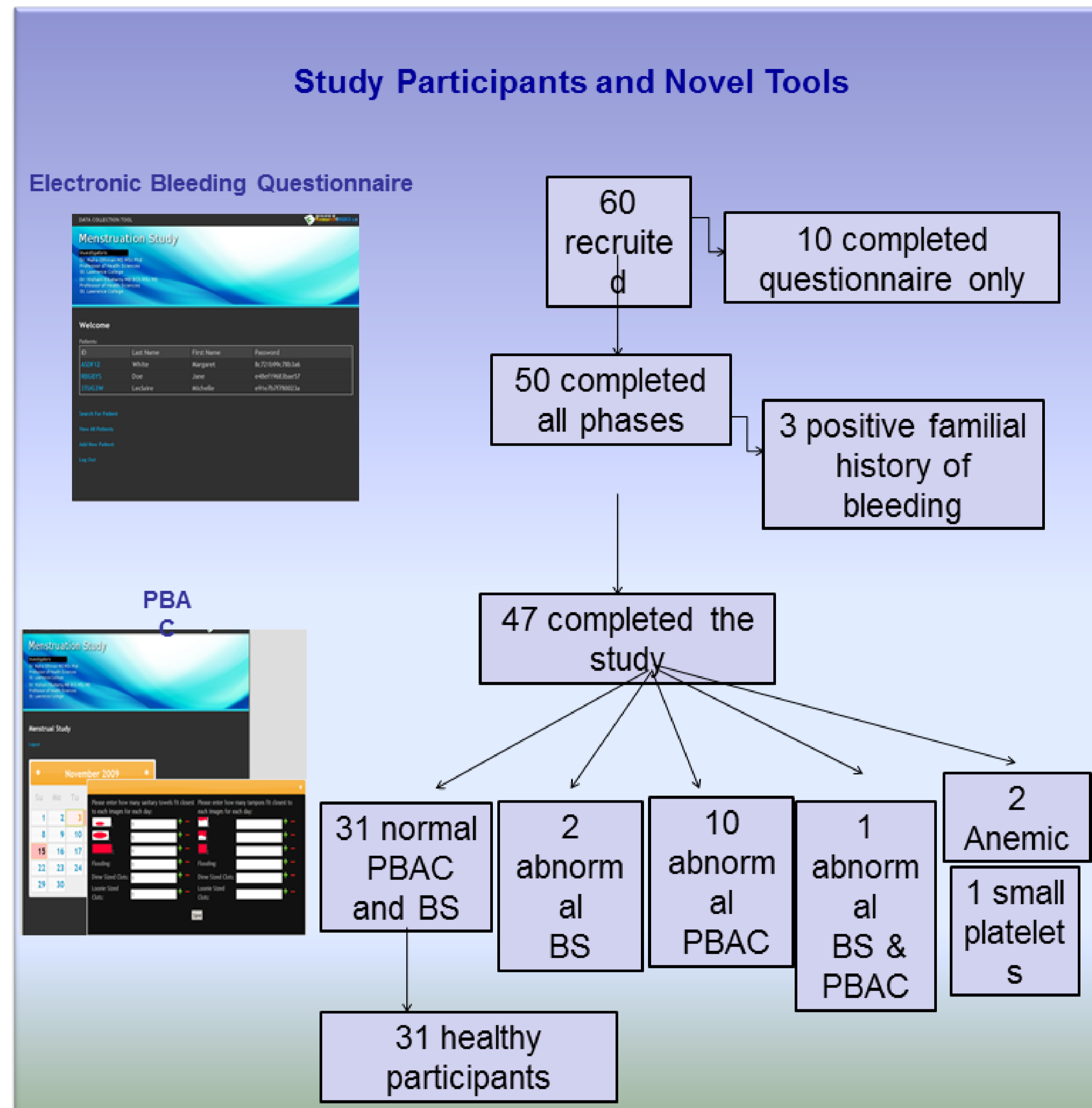
## Methods

- 47 normal females between 18-47 yrs. were tested
- Novel tools for assessment of bleeding:
  - Electronic Bleeding Questionnaire (e-BQ)
  - Electronic Pictorial Blood Assessment Chart (e-PBAC)
- Thrombelastography (TEG); a global haemostatic assay
- Whole Blood Aggregation (WBA)
- Platelet Count and Size (MPV)
- PT and APTT

## Conclusion

- Electronic bleeding questionnaire and score assisted in identification of 3 females with MBD out of the 47 tested seemingly normal individuals
- Electronic PBAC enhanced the correctness of menstrual data and led to proper identification of 11 cases of menorrhagia out of the 47 tested females. They were referred for gynecological investigation
- TEG is unlikely to predict MBD but can show hypercoagulability in some patients with menorrhagia
- We report for the first time, normal ranges for TEG parameters and platelet aggregation in 31 normal females during proliferative phase of uterine cycle

## Results



MBD Among Seemingly Normal Women

	BS	PBAC	Hb g/L	Hct	Plt x10 <sup>9</sup> /L	MPV fl	R min	Alpha degrees	MA mm	CI	LY30 %	ADP ohms	Collagen ohms	Ristocetin ohms
Normal range	1 to 4	< 100	120-160	0.37-0.47	150-450	7.0-11.0	9-27	22-58	44-64	3-13	0-8	9-14	15-27	> 5
Study range	1 to 4	< 100					3.5-15.8	26-69.5	53.4-75.4	1.7-4.5	0.1-6	3.9-23.5	12.0-23.5	6.1-18.6
# 14	1	246	131.0	0.38	317.0	9.3	6.4	49.2	81.4	5.7	0	12.8	23	15.3
# 15	1	483	141.0	0.42	203.0	8.1	7.8	58.9	63.3	2.2	0.3	7.3	9.8	6.6
# 27	7	248	122.0	0.36	278.0	8.3	6.4	62.5	65.2	2.7	0.1	5.9	4.7	7.3
# 28	0	744	139.0	0.40	306.0	7.7	7.7	40.9	68.7	3.5	0.2	3.1	3.5	6.3
# 29	2	236	146.0	0.41	181.0	8.9	5.2	62.2	63.5	2.8	0.6	4.3	12.2	6.9
# 31	5	72	122.0	0.35	212.0	7.2	7	63.1	63.3	2.2	0	11	5.1	6.9
# 33	6	96	137.0	0.40	217.0	8.1	9.5	57	62	1.6	0.1	9.8	15.1	12
# 37	2	105	146.0	0.42	397.0	8.2	2.4	78	75.1	5	0.5	11.8	18.6	26.3
# 38	2	116	122.0	0.36	184.0	9.3	7.8	55.2	61.7	2	0.7	10.8	17.6	17.1
# 43	1	131	130.0	0.37	268.0	7.8	6.2	46.3	66.7	3.4	0.6	10.4	19.4	12.7
# 44	2	140	122.0	0.38	251.0	8.3	3.9	54	69.9	4.3	0	13.7	19	21
# 56	4	180	128.0	0.36	254.0	8.7	4.2	55.4	72.3	4.6	0.2	12	15.9	12
# 57	2	516	140.0	0.41	222.0	8	9.1	55.5	64.5	2.1	0	2.7	15.7	7.6

- 3 cases out of 47 participants had high bleeding score (further investigation led to diagnosis of VWD)
- 11 cases had increased PBAC, 1 case had both high BS and high PBAC
- TEG was not able to predict MBD in these cases
- Normal ranges for platelet aggregation and TEG parameters in this particular population is different from published reference ranges

Representative Thromboelastography and Whole Blood Aggregation

