

# Maternal Renal Interlobar Vein Impedance Index is higher in early-onset than in late-onset Preeclampsia.

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**Aims:** It has been reported that peripheral vascular resistance differs between Early- (EPE) and Late-Onset (LPE) Pre-eclampsia (PE). In this study, we tested the hypothesis that Renal Interlobar Vein (RIV) Doppler parameters differ between EPE, LPE and uncomplicated pregnancy (UP), both during pregnancy and post-partum.

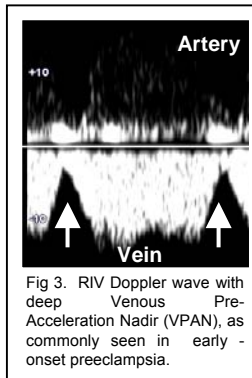
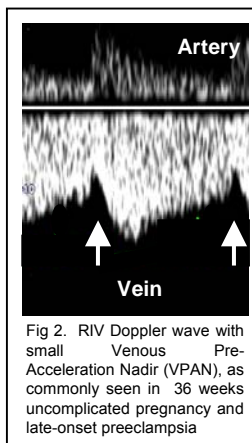
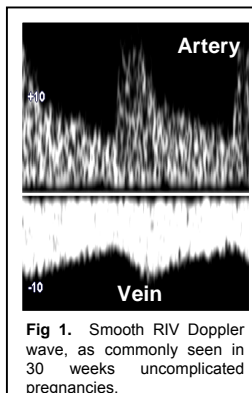
**Methods:** All women had a renal duplex scan according to a standard protocol. RIV maximum (MxV) and minimum (MnV) velocities were measured twice in UP (28–32w and 34-37 w) and once in EPE (< 34w) and LPE (≥ 34w). All women were rescanned 1-18 months postpartum. Delta velocity ( $\Delta V$ ) and Impedance Index (RIVI) were calculated as  $MxV - MnV$  and  $\Delta V / MxV$ , respectively. Doppler wave prints were labelled and pooled for blind evaluation (WG) for presence or absence of a Venous Pre-Acceleration Nadir (VPAN), defined as fast deceleration of forward flow during the last hundred milliseconds of the venous Doppler wave (indicated by arrow in Figure 2 & 3). Student-t-test was used for inter- and intra-subgroup comparisons.

**Results:** Results are presented in Table 1. RIVI was significantly higher in EPE than in LPE, both in left and right kidneys. In EPE, VPAN was observed more frequently in EPE than in 30 weeks UP (UP30w), but this fraction was not different from 36 weeks UP (UP36w) nor from LPE. However, VPAN was deeper and more prominent in EPE than in LPE or UP36w : this is reflected in significantly larger Delta Velocities in EPE than in both other groups. In postpartum, no differences were found between subgroups.

<b>Table 1</b>	<b>UP30w</b>		<b>EPE</b>		<b>LPE</b>		<b>UP36w</b>
	<b>(n=18)</b>	<b>p</b>	<b>(n=21)</b>	<b>p</b>	<b>(n=19)</b>	<b>p</b>	<b>(n=18)</b>
<b>Gestation (w)</b>	30.0±1.9	0.40	30.6±2.3		35.9±1.4	0.68	36.0±0.5
<b>Left kidney</b>							
<b>Max Velocity</b>	9.20±1.73	0.19	8.47±1.69	0.02	7.25±1.59	0.02	8.41±1.38
<b>Min Velocity</b>	5.90±1.24	0.0003	4.39±1.09	0.90	4.35±1.05	0.02	5.17±1.01
<b>Delta Velocity</b>	3.30±0.64	0.04	4.08±1.47	0.002	2.89±0.73	0.35	3.08±0.49
<b>Impedance Index</b>	0.36±0.04	0.0001	0.48±0.11	0.02	0.41±0.07	0.07	0.37±0.06
<b>VPAN n (%)</b>	6 (33)	0.04	15 (71)	0.22	9 (47)	0.61	11 (61)
<b>Right kidney</b>							
<b>Max Velocity</b>	10.3±2.39	0.15	9.28±1.93	0.61	8.93±2.37	0.52	9.38±1.91
<b>Min Velocity</b>	6.93±1.62	0.0002	4.88±1.51	0.06	5.80±1.48	0.10	6.58±1.42
<b>Delta Velocity</b>	3.38±0.87	0.04	4.40±1.92	0.03	3.13±1.71	0.46	2.80±0.82
<b>Impedance Index</b>	0.33±0.04	0.001	0.46±0.15	0.02	0.36±0.11	0.04	0.30±0.05
<b>VPAN n (%)</b>	2 (11)	0.004	13 (62)	0.35	8 (42)	0.35	4 (22)

**Conclusion:** RIVI is raised in EPE relative to both LPE and UP. This result is related to a deeper and more prominent Venous Pre-Acceleration Nadir in EPE than in LPE.

**Figures:** Three different Doppler wave patterns of Renal Interlobar veins (RIV) during pregnancy.



**Our observation supports the view that PE-related maternal vascular maladaptation is accompanied by abnormal Renal Interlobar Vein Doppler parameters, and this is more pronounced in EPE than in LPE.**