

T cell metabolomics in Pre-eclampsia, Pregnancy with Chronic hypertension & Normal pregnancy

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Objective

- Pre-eclampsia (PE): Life-threatening disorder in pregnancy associated with chronic inflammation & placental dysfunction.
- Exact etiology unknown, altered T cell response leading to imbalance of cytokine metabolites is thought to play a role in pathogenesis & progression.
- Study compared levels of cytokine metabolites produced by different T cell subsets (TH1, TH2, TH17, TReg) in PE, Pregnancy with Chronic hypertension (CHT) & Normal pregnancy (NP) and examined its association with pregnancy outcome
- Cytokines secreted by TH2 and TReg cells are anti-inflammatory while those secreted by TH1 & TH17 cells are pro-inflammatory

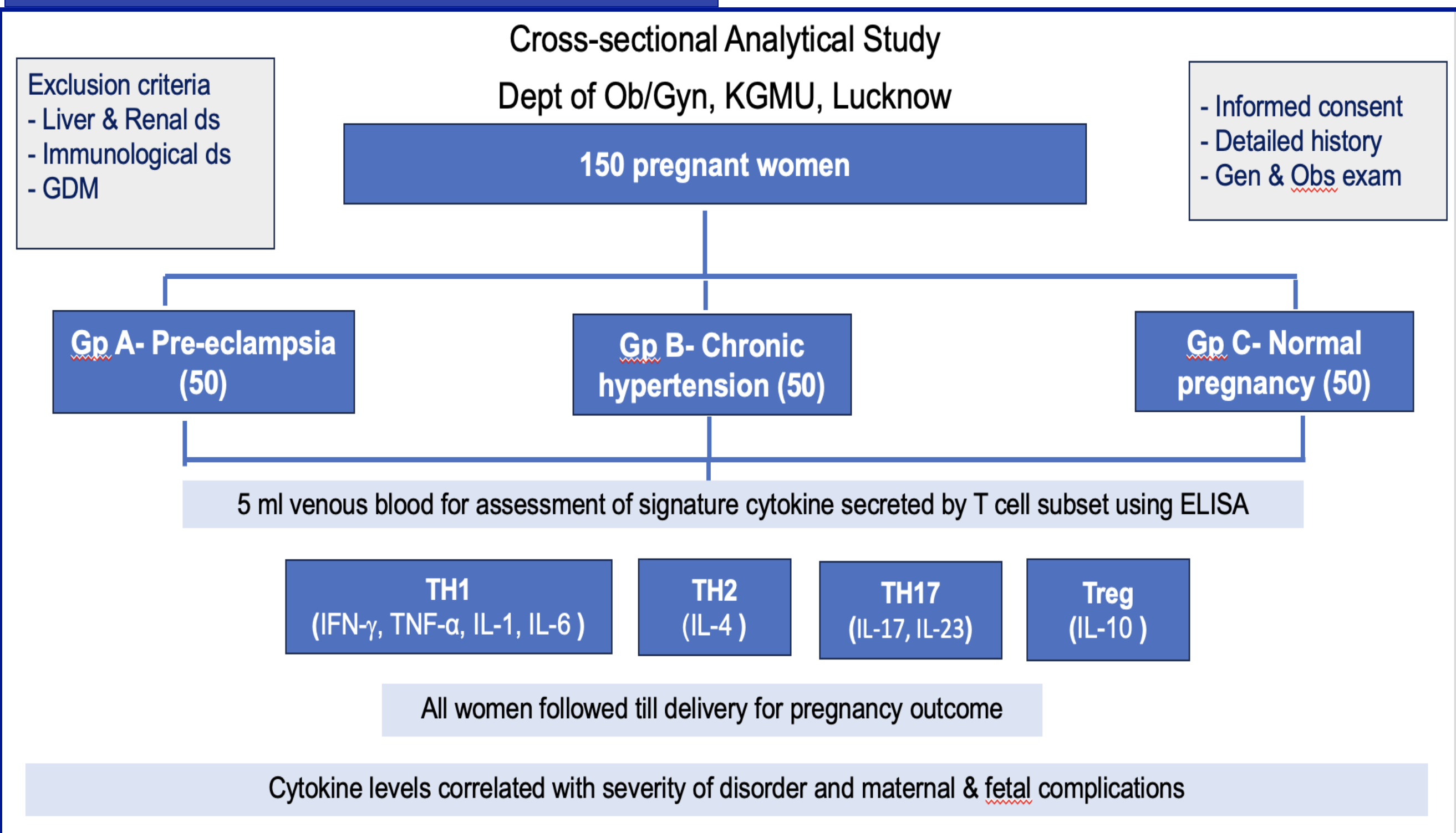
Design

Cross-sectional analytical study to measure levels of different cytokine metabolites in pregnant women in different groups and study its association with pregnancy outcome.

Conclusion

- Pro-inflammatory cytokines correlated with severity & complications of PE, may have a role in pathogenesis & progression of PE
- Signature cytokines may be used as predictive biomarkers for severe PE
- They may also be used as future therapeutic targets for development & progression of preeclampsia syndrome complex

Method



Results

Table 1: Cytokine levels (pg/mL) in different groups

Cytokine	Group A		Group B		Group C		Annova	
	Mean	SD	Mean	SD	Mean	SD	F	p
INF- γ (TH1)	663.8	171.1	371.2	175.3	332.2	155.3	58.553	<0.001
TNF- α (TH1)	235.4	67.9	70.9	43.5	50.2	29.9	208.743	<0.001
IL-1 (TH1)	477.9	229.8	297.2	190.0	261.3	198.7	15.749	<0.001
IL-6 (TH1)	351.6	65.5	82.2	44.1	62.2	30.4	547.389	<0.001
IL-4 (TH2)	232.3	160.5	113.1	116.8	162.3	130.7	9.526	<0.001
IL-17 (TH17)	24.4	11.1	11.3	8.1	8.1	3.9	54.460	<0.001
IL-23 (TH17)	1919.8	882.6	337.3	576.9	223.4	325.4	110.771	<0.001
IL-10 (Treg)	76.8	47.3	184.0	142.9	211.3	48.0	30.374	<0.001

Table 2: Cytokine levels in Group A in Early (≤ 34 wks) vs Late PE

Cytokine	PE ≤ 34 wk POG (n=16)		PE > 34 wk POG (n=34)		Student t test	
	Mean	SD	Mean	SD	t	p
INF- γ (TH1)	680.6	171.5	655.9	172.9	0.473	0.639
TNF- α (TH1)	242.1	64.6	232.3	70.2	0.471	0.640
IL-1 (TH1)	431.5	257.4	499.7	216.2	-0.980	0.332
IL-6 (TH1)	328.7	76.9	362.4	57.5	-1.728	0.090
IL-4 (TH2)	214.0	143.5	240.9	169.3	-0.549	0.586
IL-17 (TH17)	25.9	11.2	23.7	11.2	0.638	0.527
IL-23 (TH17)	1844.0	775.6	1955.4	937.5	-0.413	0.682
IL-10 (Treg)	81.4	49.6	74.6	46.8	0.469	0.641

Fig 1: Comparison of Cytokine levels in all 3 groups

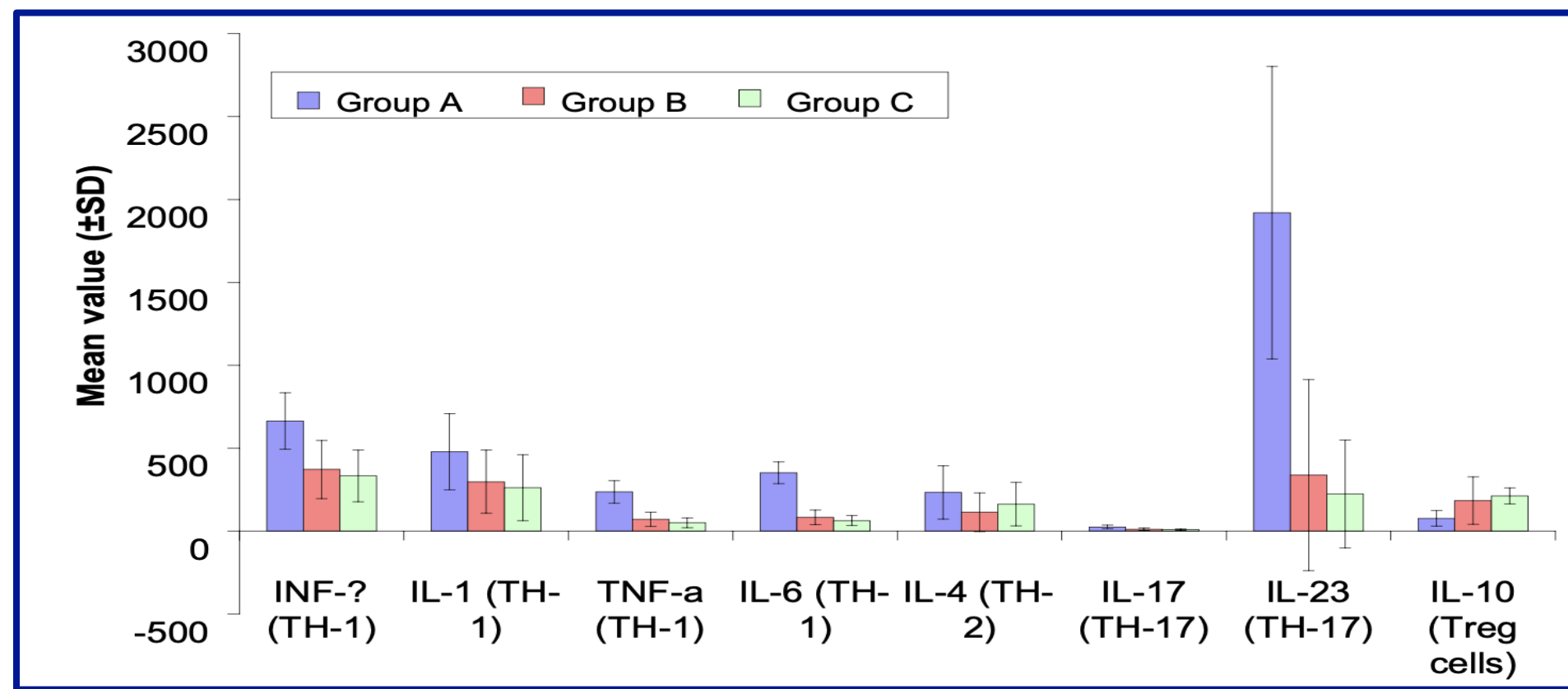


Fig 3: Post-partum complications in current pregnancy in 3 groups

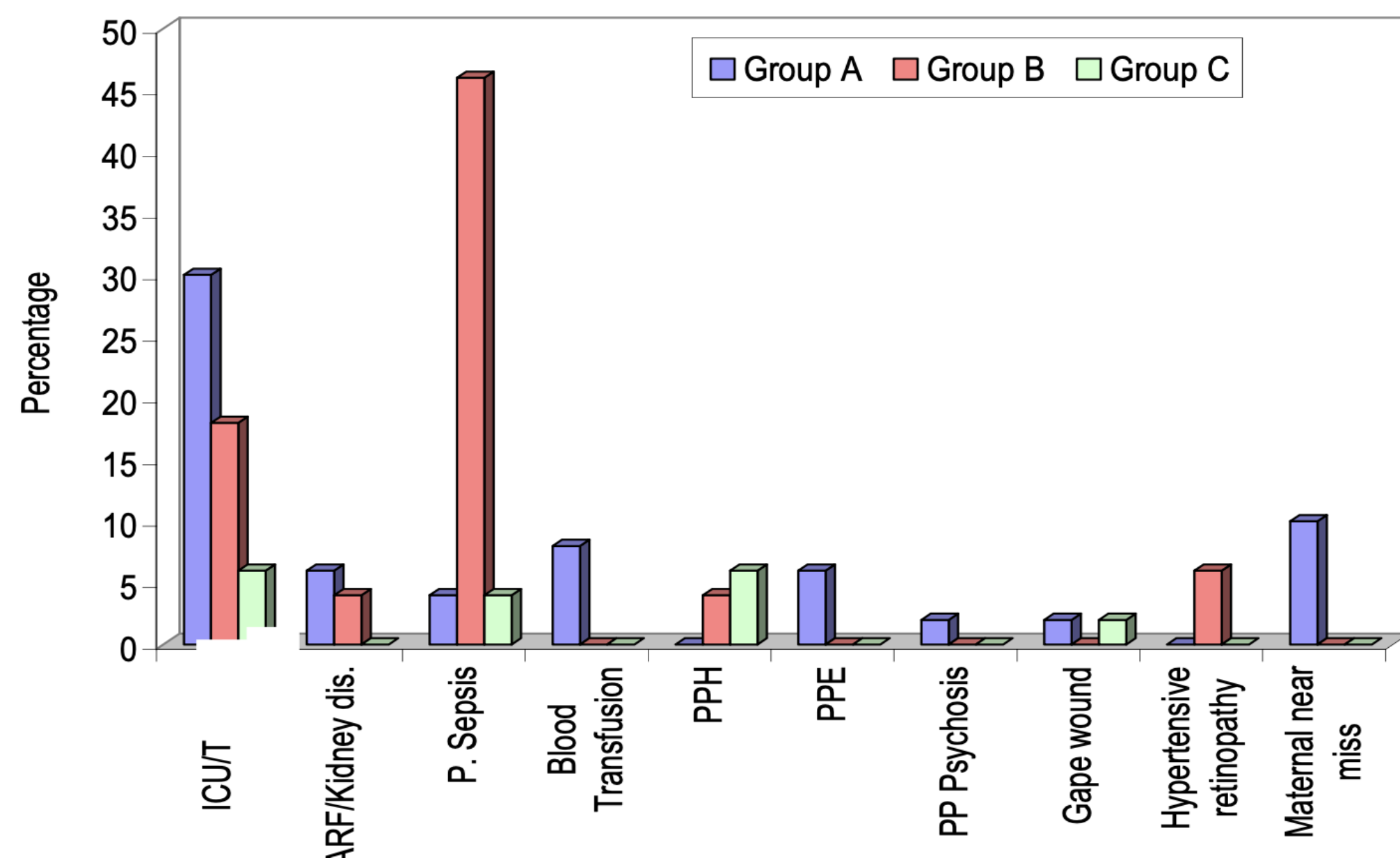
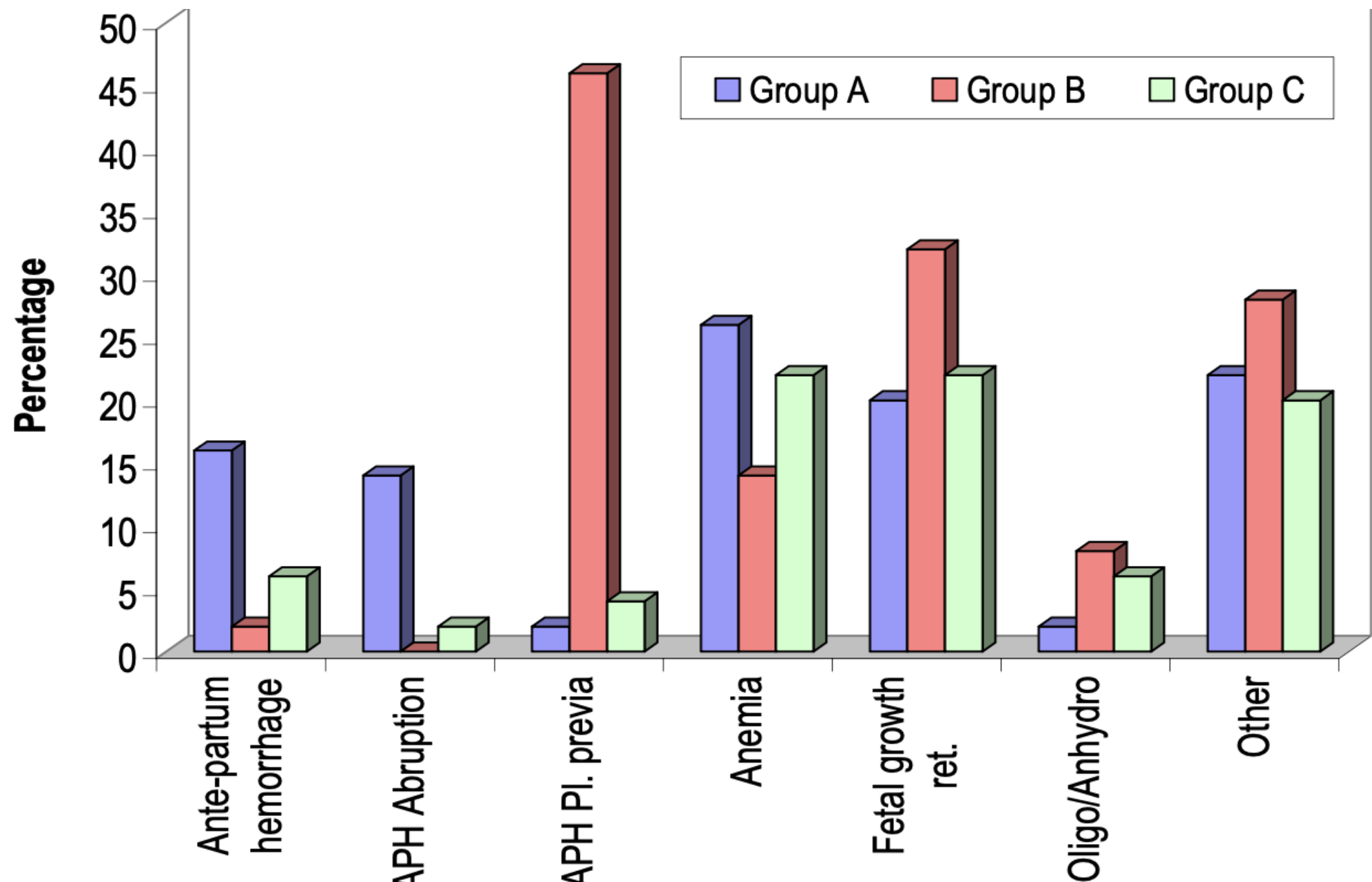


Table 3: Cytokine levels in Group B in Early (≤ 34 wks) vs Late conversion to PE

Cytokine	Conversion to PE at ≤ 34 wk POG (n=18)		Conversion to PE at > 34 wk POG (n=3)		Student t test	
	Mean	SD	Mean	SD	t	p
INF- γ (TH1)	339.4	122.6	303.9	56.0	0.486	0.633
TNF- α (TH1)	72.9	46.2	69.1	66.2	0.127	0.900
IL-1 (TH1)	296.0	206.6	241.1	148.7	0.438	0.666
IL-6 (TH1)	67.7	43.7	93.8	58.9	-0.917	0.371
IL-4 (TH2)	135.2	164.8	102.9	30.9	0.332	0.743
IL-17 (TH17)	11.4	7.2	8.0	6.6	0.768	0.452
IL-23 (TH17)	231.9	249.4	1107.5	1509.7	-2.583	0.018
IL-10 (Treg)	160.6	79.4	205.4	48.6	-0.937	0.361

Fig 2: Obstetric complications in current pregnancy in 3 groups



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