



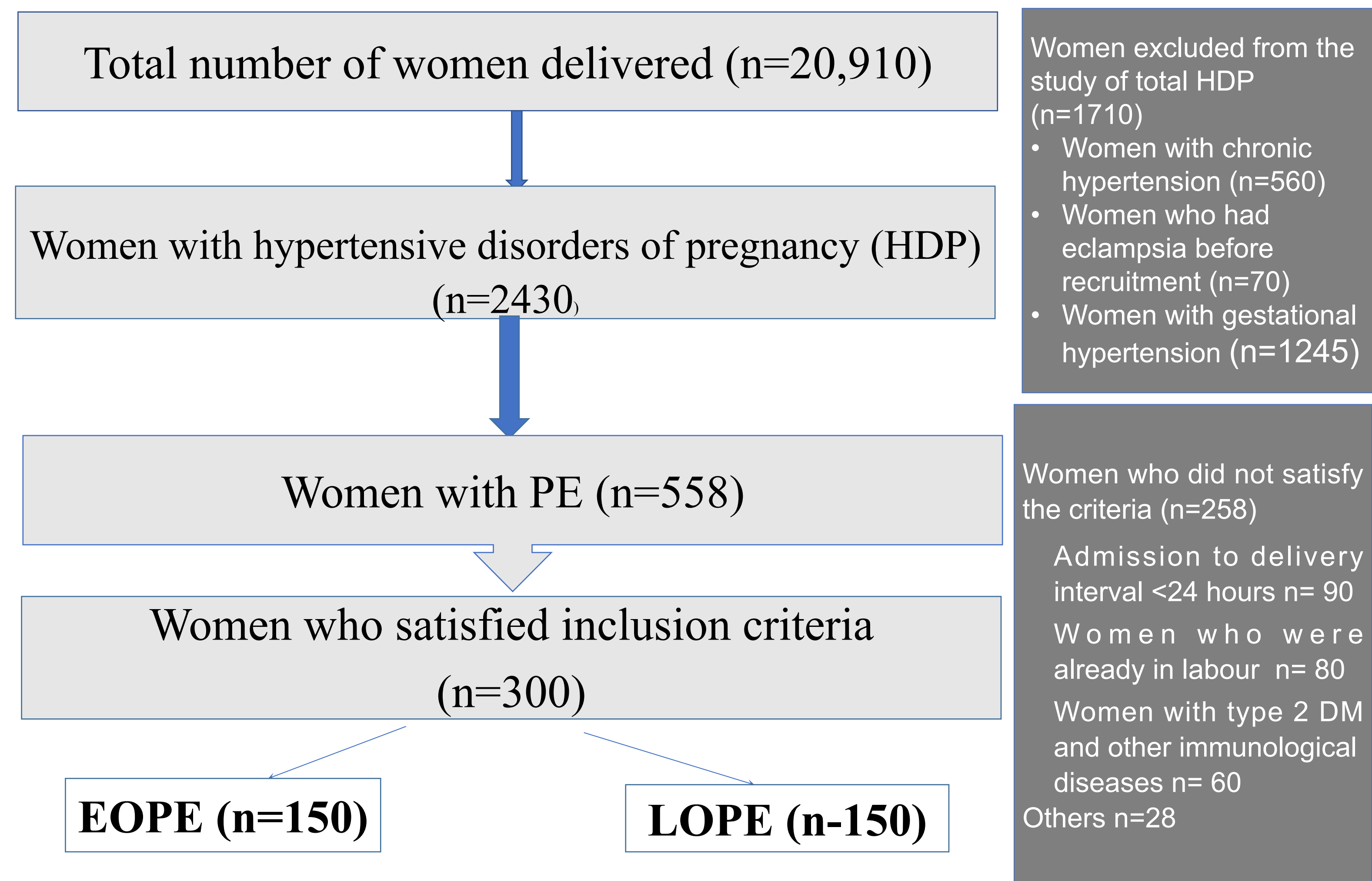
CORRELATION OF PLACENTAL HISTOPATHOLOGY AND ADVERSE OUTCOME IN TWO PHENOTYPES OF PREECLAMPSIA

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INTRODUCTION

Preeclampsia (PE) is a major cause of maternal mortality globally, with an incidence of 2-8%. It is characterized by endothelial dysfunction leading to global vasospasm and multisystem involvement, and is responsible for 16-25% of maternal deaths worldwide. The exact pathogenesis of PE is still under investigation and thought to be multifactorial but it has a common interface at fetal and maternal circulation. Of late, early and late onset PE (EOPE & LOPE) are found to be two distinct forms with distinct pathology and outcomes. As a known factor, placenta plays a key role in the pathogenesis of PE. Abnormal placental development in early pregnancy and subsequent growth restriction usually associated with EOPE, while LOPE is usually associated with maternal maladaptation to oxidative stress.

METHODOLOGY



RESULTS

Table 1 Patient characteristics	Mean values		P value
	EOPE	LOPE	
Age (years)	26.89 ± 5.22	25.6±4.8	0.64
Nulliparity	114 (76)	107 (71)	0.34
BMI (kg/m ²)	25.8±4.6	26.9±3.9	0.01
Previos PE history	13 (8.6)	21 (14)	0.15
GA at diagnosis (weeks)	32.2±3.1	36.8 ±1.5	<0.001
Gestational Diabetes Mellitus	25 (16.6)	26 (17.3)	0.87
Mean SBP at admission (mm Hg)	159 ±14	142.3±13.63	0.002
Mean DBP at admission (mm Hg)	96.89 ±9.5	92.04 ±8.9	0.021

OBJECTIVES

To compare the histopathological findings of placenta in EOPE and LOPE

To correlate with composite adverse fetomaternal outcomes in EOPE and LOPE with placental morphology

Table 2. Details of maternal outcomes among women with EOPE and LOPE

Sl No	Outcomes	N Total: 300(%)	EOPE N-150 (%)	LOPE N-150 (%)	P value
1.	Non severe PE	92 (30.67)	22(14.67)	70(46.67)	<0.001
2.	Severe PE				
	Severe PE (without organ dysfunction)	167(55.67)	98(65.33)	69(46.33)	
	HELLP/partial HELLP	16 (5.33)	13(8.66)	3 (2)	
	Eclampsia	11 (3.67)	7 (4.64)	4 (2.6)	
	Abruption	8 (2.67)	6 (4)	2(1.2)	
	Pulmonary edema	6(2)	4 (2.6)	2 (1.2)	
3.	Composite adverse maternal	109 (36)	77(50.6)	32 (21.3)	<0.001

Fig 1. Various histopathological findings of placenta among women with PE.

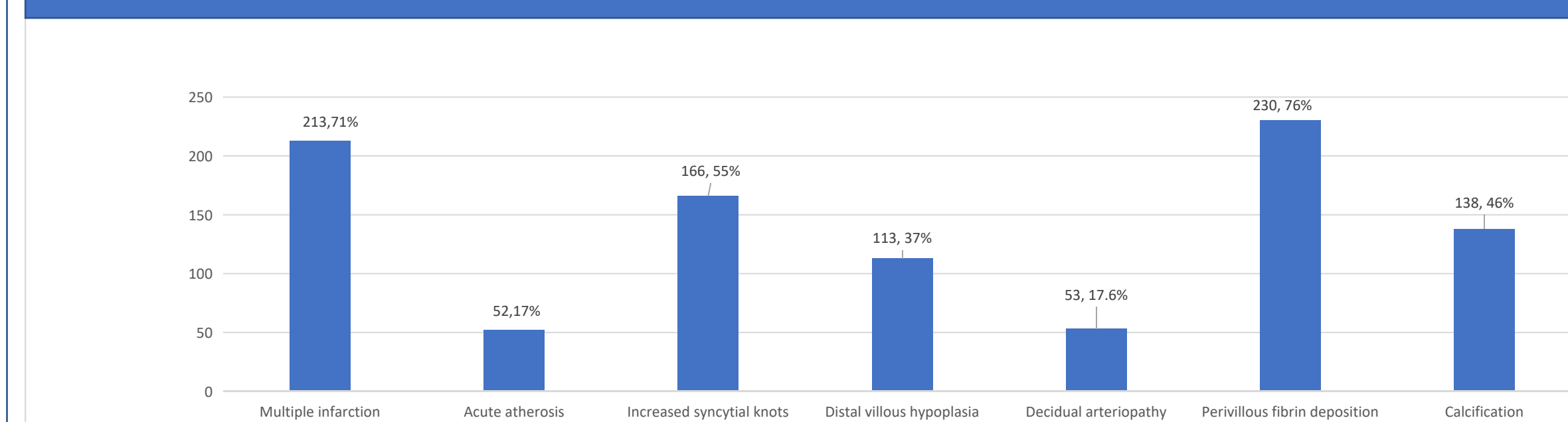


Table 5. Comparison of CAMO, CAPO with histopathological findings in EOPE

Sl No	Positive histopathological findings N (%)	CAMO {N (%)}		P value	CAPO {N (%)}		P value
		Absent n=90(60%)	Present n=60(40%)		Absent n=16 (10.6%)	Present n=134(89.4%)	
1	Multiple infarction n=118 (78.6)	64 (71)	54 (90)	<0.001	8 (5)	110 (82)	0.003
2	AA n=40 (26.6)	3(3.3)	37 (61.6)	<0.001	3 (18.7)	37 (27.6)	0.449
3	DVH n=79 (52.6)	39 (43)	40 (66)	0.005	3 (18.7)	76 (56.7)	<0.001
4	Increased SK n=117 (78)	62(68.8)	55 (91.6)	<0.001	9 (7.6)	108 (80.5)	0.026
5	DA n=41 (27.3)	1 (1.1)	40 (66.6)	0.009	1 (2.4)	40 (29.8)	0.045
6.	PVFD n=141 (94)	90 (100)	51(85)	0.81	15(7.08)	126 (94)	0.013
7.	Calcifications n=48 (32)	7 (7.7)	41 (68.3)	0.98	6 (37.5)	42 (31.3)	0.61

Table 7. Multivariate analysis of histopathological findings of placenta predicting CAMO in women with EOPE and LOPE

Sl. No	Histopathological findings	OR (95% CI)	P value	Adjusted OR (95% CI)	P value
1.	EOPE				
	Multiple infarctions	2.65(1.40-9.53)	0.008	1.33(1.08-5.65)	0.01
	AA	2.15(1.55-2.40)	0.002	1.81(1.35-1.83)	0.02
	Increased SK	2.5(1.04-6.00)	0.04	1.61(1.41-4.24)	0.01
	DVH	2.61(1.3-5.16)	0.006	1.75(1.58-3.92)	0.02
	DA	1.48(1.19-5.17)	0.015	1.2 (1.06-2.1)	<0.001
	PVFD	1.63(1.17-2.29)	0.48	1.52(1.17-2.91)	0.64
2.	LOPE				
	Multiple infarctions	6.15(3.45-197.9)	0.002	7.23(1.92-153.8)	0.11
	AA	4.30(1.28-14.43)	0.018	6.16(1.31-28.9)	0.02
	Increased SK	5.11(2.23-11.72)	<0.0001	2.11(1.82-5.44)	0.120
	DVH	2.61(1.11-6.14)	0.027	1.10(1.09-3.08)	0.84
	DA	9.5(2.64-34.11)	0.001	5.64(1.44-21.9)	0.013
	PVFD	2.78(1.79-4.02)	0.16	1.79(1.28-2.21)	0.665

Table 3. Adverse perinatal outcome in women with EOPE and LOPE

Sl. No.	Perinatal outcome	Total (n=300)	EOPE (n=150)	LOPE (n=150)	P value
		N (%)	N (%)	N (%)	
1.	SGA	58 (19.3)	23 (15)	35 (23.3)	<0.001
2.	FGR	120 (40)	77 (51.33)	43 (28.67)	
3.	SB	19 (6.3)	19 (12.67)	0(0)	
4.	NND	15 (5)	15 (10)	0 (0)	

Table 4. Histopathological findings of placenta in women with EOPE and LOPE

Sl. No.	Variable N (%)	EOPE (n=150) N (%)	LOPE (n=150) N (%)	P value
1	Multiple infarction	118 (78.6)	105 (70)	>0.05
2	AA	40 (26.6)	12 (8)	<0.001
3	Increased SK	117 (78)	49 (32.6)	<0.001
4	DVH	79(52.6)	34 (22.6)	<0.001
5	DA	41(27.3)	12(8)	<0.001
6	PVFD	141(94)	87(58)	<0.001

Table 6. Comparison of CAMO, CAPO with histopathological findings in LOPE

Sl No	Positive histopathological findings n(%)	CAMO {N (%)}		P value	CAPO {N (%)}		P value
		Absent n=119(79.5%)	Present n=31(20.6%)		Absent n=71(47.3%)	Present n=79(52.7%)	
1	Multiple infarction n=105 (63)	65 (54)	30 (96)	<0.001	35 (36.8)	60 (75.92)	0.001
2	AA n=12 (8)	4 (3.3)	8 (25.81)	0.334	3 (4.2)	9 (11.30)	0.10
3	DVH n=34 (22.6)	22 (18.4)	12 (38.76)	0.01	10 (14)	24 (32)	0.01
4	Increased SK n=49 (32.6)	25 (21)	24 (77.41)	<0.001	16 (22.5)	33 (41.77)	0.01
5	DA n=12 (8)	2 (1.6)	10 (32.20)	0.03	5 (7.04)	7 (8.86)	0.68
6.	PVFD n=87 (58)	62 (52.1)	25 (80.63)	0.30	36 (50.72)	51 (64.51)	0.8
7.	Calcification n=90 (60)	69 (57.9)	21 (67.72)	0.31	44 (61.91)	46 (58.22)	0.6

Table 8. Multivariate analysis of histopathological findings of placenta predicting CAPO in women with EOPE and LOPE

	Histopathological findings	OR	P value	ADJUSTED OR	P value
1.	EOPE				
	Multiple infarctions	3.54(1.56-13.42)	0.006	1.30(1.11-7.44)	0.33
	AA	1.65(1.44-6.13)	0.453	1.96(1.2-4.12)	0.24
	Increased SK	3.23(1.10-9.48)	0.033	2.82(2.45-6.26)	0.01
	DVH	5.67(1.54-20.85)	0.009	2.90(2.67-12.40)	0.01
	DA	4.38(0.81-29.9)	0.077	1.66(1.28-14.20)	0.03
	PVFD	1.91(1.10-7.76)	0.938	1.29(1.12-18.18)	0.828
2.	LOPE				
	Multiple infarctions	3.24(1.62-6.50)	0.001	2.26(1.95-5.33)	0.06
	AA	2.91(0.75-11.22)	0.12	2.69(1.64-11.23)	0.17
	Increased SK	2.46(1.20-5.03)	0.01	1.39(1.19-3.28)	0.44
	DVH	2.66(1.16-6.06)	0.02	1.42(1.05-3.28)	0.46
	DA	1.28(1.08-4.24)	0.04	1.06(1.01-2.20)	0.03
	PVFD	2.63(1.35-5.10)	2.87	2.03(1.95-4.33)	0.06

DISCUSSION

There are seven distinct histopathological features described in the present study however other studies mentioned below has described 3 or 4 features only. Tateishi et al described mainly four features in and its frequency is almost similar to present study in EOPE. However, DA and AA were less commonly described and calcifications were more common in women with LOPE compared to present study. The features of chronic hypoxia like DVH, PVFD and infarctions were significantly more in EOPE than LOPE across all studies. The study by Stanek et al did not include severe PE despite this they also observed chronic hypoxic findings more commonly in EOPE.

CONCLUSION

The placental histopathological findings suggestive of MVP and PVFD were frequently seen in EOPE. The features of MVP was independently associated with adverse pregnancy outcome in women with EOPE and not LOPE.

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