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Adverse pregnancy outcomes and complications associated with low pregnancy-associated plasma protein A in Jordanian women

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Objective

To investigate the association between low first trimester PAPP-A levels and antenatal complications and adverse perinatal outcomes in Jordanian women.

Methods

A retrospective cohort study was conducted on 2525 singleton pregnancies during routine first trimester visits between 2005-2012 at the Farah Hospital, Amman, Jordan. Maternal characteristics, medical history, pregnancy complications and outcome, and serum PAPP-A levels were retrieved from medical records. Statistical analysis was performed using IBM SPSS 20 and included unconditional logistic regression, where results were reported with odds ratios and p value of <0. 05 considered statistically significant.

Results

PAPP-A ≤0. 5MoM was significantly associated with oligohydramnios (OR=2. 6) and small for gestational age fetus (OR=1. 7). PAPP-A level ≤0. 4MoM was significantly associated with oligohydramnios (OR=3. 4), SGA (OR=2. 1)gestational diabetes GD (OR=1. 9) and SM (OR=4. 3) in women with advanced maternal age. A PAPP-A ≤0. 3MoM was associated with SM(OR=4. 7) and SGA(OR=2. 6). PAPP-A levels ≤0. 2MoM were mainly associated with SM (OR=8. 3)Low levels of PAPP-A were not associated with preeclampsia, placental abruption, preterm delivery, and stillbirth in Jordanian women.

Conclusion

A low First-trimester serum PAPP-A ≤0. 5MoM could predict oligohydramnios and having an SGA newborn in pregnant Jordanian women. However, the most significant predictive value was a PAPP-A ≤0. 4MoM which predicted oligohydramnios SGA and GD in addition to SM in women of advanced maternal age. First-trimester serum PAPP-A levels were not associated with other studied complications and outcomes. First trimester triple screen should be incorporated into routine antenatal management offered to the general public in Jordan.

Table 1. Characteristics of the study population.

Characteristic	PAPP-A level					Total n=2,525
	>0.5 MoM n=2157	≤0.5 MoM n=368	≤0.40 MoM n=185	≤0.30MoM n=72	≤0.2 MoM n=17	
Age, mean ±SD	32.1±5.2	32.8±5.1	32.4±5.1	32.5±4.9	33.7±5.2	32.1±5.2
Maternal age >35 years, n (%)	658 (30.6%)	125 (33.9%)	55 (29.7%)	20 (27.8%)	6 (35.3%)	783 (31.0%)
Weight, mean ±SD	66.8±12.4	67.8±11.4	67.6±10.9	68.1±12.0	68.1±12.0	66.9±12.3
Smoking, n (%)	126 (5.8%)	11 (2.9%)	5 (2.7%)	2 (3.6%)	0 (0.0%)	137 (5.4%)
IVF, n (%)	215 (9.9%)	48 (13.0%)	25 (13.5%)	14 (19.4%)	5 (29.4%)	263 (10.4%)
Gestational age, mean ±SD	12.6±0.6	12.6±0.6	12.5±0.6	12.4±0.6	12.2±0.6	12.6±0.6

Table 2. PAPP-A levels and adverse outcomes.

Complication	Study Population				Maternal age > 35 years			
	PAPP-A ≤0.50 MoM n=368	PAPP-A >0.5 MoM n=2,157	OR [95%CI]	p-value	PAPP-A ≤0.50 MoM n=125	PAPP-A >0.5 MoM n=658	OR [95%CI]	p-value
Miscarriage	8 (2.2)	34 (1.6)	1.4 [0.6-	0.406	6 (4.8)	15 (2.3)	1.8 [0.6-	0.347
Preeclampsia	3 (0.8)	10 (0.5)	1.8 [0.5-	>0.05	2 (1.6)	4 (0.6)	2.7 [0.5-	0.246
Gestational	51 (13.9)	281 (13.0)	1.1 [0.8-	0.662	22 (17.6)	100 (15.2)	1.2 [0.7-	0.497
Oligohydramnio	11 (2.9)	25 (1.2)	2.6 [1.3-	0.006	4 (3.2)	5 (0.08)	4.3 [1.1-	0.041
Abruption	2 (0.5)	16 (0.7)	0.7 [0.2-	>0.05	1 (0.8)	4 (0.6)	1.3 [0.1-	1.000
Preterm	29 (7.9)	127 (5.9)	1.4 [0.9-	0.143	10 (8.0)	37 (5.6)	1.5 [0.7-	0.306
Stillbirth	2 (0.5)	7 (0.3)	1.7 [0.3-	>0.05	1 (0.8)	0 (0.0)	-	-
Small for	28 (7.6)	99 (4.6)	1.7 [1.1-	0.014	8 (6.4)	21 (3.2)	2.2 [0.8-	0.127