Haematologic parameters to predict SGA and/or oligohydramnios

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Objective

We aimed to investigate whether certain haematologic parameters can predict Small for Gestational Age (SGA) and/or oligohydramniosis, regarding their importance about perinatal morbidity and mortality.

Methods

In this retrospective study, 505 pregnant women (above the gestational age of 27 weeks and 6 days) were included, between January 2012 and December 2013, who were admitted for delivery and didn't have any foreknown systemic diseases, anaemia and other risk factors like drug use (including alcohol, cocaine and smoking). Patients diagnosed with Small for Gestational Age (SGA) (smaller than 10th percentile; Group-I, n=64), SGA and oligohydramnios (smaller than 10th percentile and amniotic fluid index < 50 mm; Group-II, n=49), only oligohydramniosis (amniotic fluid index < 50 mm; Group-III, n=26) and control group (n=366) were randomly selected from medical records. Haematologic parameters in first trimester and third trimester, demographic data like maternal age, previous reproductive history, Body Mass Index (BMI), gestational age at birth, mode of delivery, birthweight and gender of the neonate were obtained from medical records. The patients were all had to have normal C-Reactive Protein (CRP) levels as well as negative cervical and urinary culture results in order to suggest that the high leukocyte counts were irrespective from any infectious process. Then, groups were compared with each other about demographic data and haematologic parameters. $p < 0.05$ value was accepted as significant.

Results

Maternal ages ranged from 17 to 44 years (mean±SD and median, 28. 1±5. 9 and 28, respectively); mean maternal age in group-I (25. 3±5. 6 years) was significantly lower than one in control group (28. 9±5. 8 years). Body Mass Index (BMI) ranged from 16. 73 to 54. 68 kg/m2 (27. 5±4. 4, median was 27. 34 kg/m2) in all patients; mean BMI in group-I (26±3. 4 kg/m2) was significantly lower than in the control group (27. 5±4. 6 kg/m2). No significant differences were present among groups regarding reproductive history. Gestational ages at birth ranged from 28 to 42 weeks (mean±SD and median, 38. 2±1. 9 and 39, respectively). Birth weights ranged from 690 to 4500 g (3095±646. 5, median was 3200 g); mean birth weights in Group-I (2219. 5±482 g) and Group-II (2171. 6±541. 3 g) were significantly lower than one in control group (3378. 9±384. 1 g). Delivery with Cesarean section was more frequent in Group-I (70. 5%) than in other groups (p=0. 01). Total leukocyte counts (p<0. 001), neutrophil counts (p<0. 001), lymphocyte counts (p=0. 002), platelete counts (p<0. 001), mean platelete volumes(MPV) (p<0. 001), 'platelete-crit' values(PCT) (p<0. 001), 'platelete distribution width' values (p<0. 001), 'ratio of large platelets' values (P-LCR)(p<0. 001), neutrophil to lymphocyte ratios (NLR)(p<0. 001) were significantly different between first and third trimester values in all patients. Platelete to lymphocyte ratios (PLR) weren't significantly different between first and third trimester values in all groups. All these parameters were similar among groups except platelete values in third trimester which in Group-I (253. 3±67. 8 x109/L) were significantly higher than in control group (228. 9±61. 9 x109/L).

Conclusion

Certain haematologic parameters like platelete indices (except platelete count in third trimester), neutrophil to lymphocyte ratio (NLR) and platelete to lymphocyte ratio(PLR) failed to predict SGA and/or oligohydramniosis in our study. A new prospective study with larger sample size may present different results.

Table 1. Some demographic and descriptive statistics among groups.

Characteristic	Grup I n=64	Grup II n=49	Grup III n=26	Controls n=366
	Mean, ±SD	Mean, ±SD	Mean, ±SD	Mean, ±SD
Age	25.3, ±5.6	25.5, ±5.3	27.0, ±5.0	28.9, ±5.8
BMI(kg/m^2)	26.0, ±3.4	28.2, ±3.8	29.5, ±4.1	27.5, ±4.6
Gestational age at birth in weeks	37.0, ±2.4	36.9, ±2.8	37.6, ±2.7	38.6, ±1.3
Birthweight in grams	2219.5, ±482.0	2171.6, ±541.3	2905.0, ±583.5	3378.9, ±384.1
NLR in the 1st trimester	2.9, ±1	3.4, ±1.4	3±, 0.9	3.3, ±1.4
NLR in the 3rd trimester	4.2, ±1.3	4.2, ±1.7	4.4±, 1.7	4.2, ±1.9
Platelete count in the 3rd trimester (x10^9/L)	253.3, ±67.8	243.65, ±66.060	244.19, ±57.590	228.9, ±61.9

SD: Standard deviation; NLR: Neutrophil to lymphocyte ratio