

Changes in complete blood count parameters, the neutrophil-to-lymphocyte ratio and the platelet-to-lymphocyte ratio, and their predictive roles in diagnosing molar pregnancy

Ala Aiob¹, Karina Naskovica¹, Inna Zilberfarb¹, Avishalom Sharon¹, Jacob Bornstein², Lior Lowenstein^{1,2}

¹Department of Obstetrics and Gynecology, Galilee Medical Center, Nahariya and Azrieli Faculty of Medicine, Bar Ilan University, Safed, ²Azrieli Faculty of Medicine, Bar Ilan University, Safed, Israel

BACKGROUND

Molar pregnancy is the most common type of gestational trophoblastic disease. Gestational trophoblastic disease is characterized by lower absolute and relative lymphocyte levels and a lower white blood cell (WBC) count relative to normal pregnancy. However, no studies have examined the WBC count relative to missed abortion. The aim of this study was to investigate whether blood parameters, such as neutrophil and lymphocyte counts, the neutrophil-to-lymphocyte ratio (NLR), the platelet-to-lymphocyte ratio (PLR), WBC count and platelets can distinguish gestational trophoblastic disease from missed abortion.

METHODS

This retrospective study included 104 women diagnosed with molar pregnancy and 110 women with missed abortions during 2010-2020 at one institution. Sixty-nine women had partial moles (PM) and 35 had complete moles (CM). We extracted and compared maternal and pregnancy characteristics, and laboratory parameters of all the women with molar pregnancy, and separately for those with PM and CM, compared to women with missed abortion.

RESULTS

The mean neutrophil level was higher in the molar pregnancy than the missed abortion group (5.67 ± 1.92 vs. 5.02 ± 1.65 , $P=0.013$); the patients with PM largely drove this difference. In multivariable linear models, women with molar pregnancy were more likely to have higher neutrophil values than women with missed abortion ($P=0.023$). Platelet, WBC, NLR and PLR values did not differ significantly between women with gestational trophoblastic disease and women with missed abortion.

Maternal and pregnancy characteristics, and laboratory parameters - Molar pregnancy vs. missed abortion

	Molar pregnancy N=104	Missed abortion N=110	2-sided*, 1-sided+
Age, years mean	31.84(7.59)	32.18(6.10)	0.715*
Pregnancy age, mean	9.60(2.35)	9.30(2.06)	0.318*
Gravidity, range	1-10(3)	1-14(3.5)	0.011*
WBC, mean	8.35(2.36)	7.81(2.19)	0.104 *
Neutrophils, mean	5.67(1.92)	5.02(1.65)	0.013 *
Lymphocytes, mean	2.03(0.63)	1.93(0.59)	0.263*
NLR, range	0.93-9.5(2.66)	(2.64)0.94-5.21	0.447*
NLR, mean	3.01(1.4)	2.72(0.94)	

N-number, IVF-in vitro fertilization, WBC- white blood cells, PLT-platelet, NLR- neutrophil-to-lymphocyte ratio, PLR- platelet-to-lymphocyte ratio.

Maternal and pregnancy characteristics, and laboratory parameters - Partial mole vs. missed abortion

	Partial mole N=69	Missed abortion N=110	2-sided
Age, years	32.19(6.8)	32.18(6.1)	*0.995
Pregnancy age	9.88(2.54)	9.30(2.06)	0.099*
Gravidity	1-10(3)	1-14(3.5)	0.099*
WBC,	8.37(2.10)	7.81(2.19)	0.120*
PLT	243.65(50.42)	249.34(65.36)	0.535*
Neutrophils	5.65(1.73)	5.02(1.65)	0.024*
Lymphocytes	2.08(0.63)	1.93(0.59)	0.138 *
NLR	0.93-9.50(2.62)	0.94-5.21(2.64)	0.727*
NLR	2.96(1.44)	2.72(0.94)	

N-number, IVF-in vitro fertilization, WBC- white blood cells, PLT-platelet, NLR- neutrophil-to-lymphocyte ratio, PLR- platelet-to-lymphocyte ratio.

CONCLUSION

A higher neutrophil level was observed among women with molar pregnancies than among women with missed abortion. This suggests that molar pregnancies may cause a higher inflammatory response due to continued trophoblastic growth. However, the magnitude of the difference was small and not useful for establishing a diagnosis.