

THE ANALYSIS OF MATERNAL AND FETAL ABO AND RHESUS STATUS IN CASES OF PREECLAMPSIA

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INTRODUCTION

Preeclampsia (PE), a severe pregnancy-related condition, affects various organ systems. PE poses significant risks to maternal and fetal health making careful monitoring and proactive management throughout pregnancy to improve prenatal care and outcomes.

AIM

The study aimed to prospectively investigate the relationship between maternal and fetal ABO and Rhesus status and PE

PATIENTS AND METHODS

A case control study was performed with 100 cases of PE (cases) and 200 cases of pregnancies not diagnosed with PE (controls). All cases and controls were women more than 18 years old, having their first baby.

In all cases maternal and fetal (umbilical vein) blood samples were taken for ABO and Rhesus C, c, D, E and e status.

Direct Coombs (DCT) and Indirect Coombs (ICT) tests were performed on umbilical blood.

STATISTICAL ANALYSIS

The associated parameters were not normally distributed therefore were analysed using non-parametric analyses.

The maternal blood groups were analysed separately from the fetal blood groups and both were analysed (case v control) using a chi-sq analysis. All data were analysed using SPSS (IBM, Armonk, USA).

RESULT

The total number of cases and controls were 100 and 200, respectively.

Below are the results of the background data. It is clear that the groups were appropriately chosen as there were significant differences between the BP in the cases and controls and also the presence of proteinuria.

Median (range)	Control (n=200)	PE (n=100)	Mann-Whitney U statistic (significance)
Systolic BP	116(100-140)	151(136-190)	14.1 (p<0.001)
Diastolic BP	74(60-90)	92(80-130)	12.6 (p<0.001)
Haemoglobin concentration	11(2.5-14)	11(6-15)	1.2 (p=0.23, NS)
Total leucocyte count	10890 (1154-20540)	10132 (6790-18776)	14.1 (p<0.001)
Platelet count	1.4(0.2-3.1)	1.5(0.32-4.4)	1.1 (p=0.2, NS)
Urea	19.8(8.4-90)	20(8.4-90)	1.8 (p=0.075, NS)
Creatinine	0.7(0.2-4.9)	0.7(0.3-4.9)	1.0 (p=0.306)
Uric acid	5.7(2.8-11.0)	7.25(3.2-14.5)	5.6 (p<0.001)
Lactate dehydrogenase	515(225-1653)	731(326-1869)	4.7 (p<0.001)
International normalized ratio	1.0(0.8-2.4)	1.0(1-4)	1.3 (p=0.196, NS)
Proteinuria (estimated protein content 0-4+)	0 (0-1)	2 (1-4)	15.4 (p<0.001)

The results of the blood tests (Rhesus and ABO) are described below.

	PE MOTHER (n=100)	PE BABY (n=100)	CONTROL MOTHER (n=200)	CONTROL BABY (n=200)	CHI-SQ MOTHERS	CHI-SQ BABIES
ABO					4.6, p=0.2	1.0, p=0.8
A	17 (17%)	20 (20%)	35 (17.5%)	37 (18.5%)		
B	35(17%)	48(48%)	76(38%)	98(49%)		
AB	28(28%)	9(9%)	36(18%)	13(6.5%)		
O	20(20%)	23(23%)	53(26.5%)	52(26%)		
Rh D					0, p=0.9	0.8, p=0.4
Pos	91(91%)	81(81%)	182(91%)	170(85%)		
Neg	9(9%)	19(19%)	18(9%)	30(15%)		
Rh C					0, p=0.95	0.01, p=0.91
Pos	67(67%)	74(74%)	134(67%)	146(73%)		
Neg	33(33%)	26(26%)	66(33%)	54(27%)		
Rh c					0.08, p=0.8	0.38, p=0.54
Pos	55(55%)	42(42%)	113(56.5 %)	93(46.5%)		
Neg	45(45%)	58(58%)	87(43.5%)	107(53.5 %)		
Rh E					1.5, p=0.22	0.01, p=0.91
Pos	36(36%)	38(38%)	86(43%)	74(37%)		
Neg	64(64%)	62(62%)	114(57%)	126(63%)		
Rh e					0.08, p=0.80	0.15, p=0.7
Pos	42(42%)	41(41%)	80(40%)	79(39.5%)		
Neg	58(58%)	59(59%)	120(60%)	121(60.5 %)		

There were no significant differences in the incidence of any blood group of the ABO and Rhesus systems in both the maternal and fetal specimens between the case and control groups.

All Coombs test results (both ICT and DCT) fetal in both PE and control groups were negative.

CONCLUSION

This prospective study of maternal and fetal ABO and Rhesus blood groups indicates that there are no significant differences between cases of PE and controls that did not suffer from PE.

SUGGESTIONS FOR FURTHER WORK

Although we have found that ABO and Rhesus blood groups are not involved in the development of PE to any significant effect there could be other blood groups that are associated. There are more than 300 blood groups and it is postulated that other groups are tested in relation to the development of PE.

We have proven that the collection of cases and control patients and the co-ordination with laboratory services is efficient and we are well placed to analyse a greater selection of blood groups.