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Letter to the Editor

Placental Growth, Fetal Growth and Maternal RhE Genotype

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The Rh locus is composed of two genes RhD, which encodes the major D antigen and is present only in Rh-positive genomes, and RhCE, which encodes both the Cc and Ee polypeptides, most likely by alternative splicing events. Several membrane components, including Rh proteins and other glycoproteins recently characterized, are probably different subunits of an oligomeric complex with transport functions in the erythrocyte [3].

In previous papers we have reported an association of maternal RhE phenotype with neonatal macrosomia [1] and with metabolic control [2] in diabetic pregnant women. The recent discoveries on the structure and functions of Rh proteins prompted us to look for possible association of RhE phenotype with placental weight and birth weight in normal pregnancy.

260 Consecutive puerperae along with their newborn babies have been examined in the population of Penne. 295 Diabetic puerperae (including gestational and pre-existing IDDM and NIDDM) from the population of Rome along with their newborn babies have also been considered. Some data on these diabetic women have been reported in previous studies [1,2]. We have now considered also placental weight not examined in our previous reports.

Table 1 shows the relationship of maternal RhE phenotype with birth weight and placental weight. In healthy puerperae there is a strong

Table 1
Birth weight and placental weight in relation to RhE maternal phenotype in healthy puerperae from Penne

	RhE phenotype								
	E			Ee			e		
	mean	S.E.	no.	mean	S.E.	no.	mean	S.E.	no.
Birth weight	4020	354	4	3250	73	55	3379	44	201
Placental weight	811	129	4	560	23	45	596	9	184

Statistical analysis		
	Variance analysis (oneway)	Pairs of groups significantly different at the 0.05 level (Tukey-HSD procedure)
Birth weight	p = 0.0043	E vs. Ee and E vs. e
Placental weight	p = 0.0010	E vs. Ee and E vs. e

Coefficient of correlation between birth weight and placental weight			
	E	Ee	e
r	0.845	0.710	0.554

Table 2
Birth weight and placental weight in relation to RhE maternal phenotype in diabetic puerperae from Rome

	RhE phenotype									
	E			Ee			e			Variance analysis
	mean	S.E.	no.	mean	S.E.	no.	mean	S.E.	no.	(p)
Birth weight	3605	388	4	3391	133	64	3417	51	227	N.S.
Placental weight	900	70	4	688	24	64	697	14	227	0.079
Difference of placental weight between E and other phenotypes (two tail p)										
E vs. Ee							p = 0.023			
E vs. e							p = 0.052			

association of RhE with both developmental parameters showing the highest values of birth weight and placental weight in E mothers and the lowest values in Ee mothers. The pattern of relationship is similar in diabetic pregnancy but less marked (Table 2). Separate analysis of the three types of diabetes has not shown differences in the pattern of relationship between placental weight and RhE.

It is interesting to note that correlation between birth weight and placental weight increases with the dose of *E "allele", showing the highest value in *E/*E and the lowest in *e/*e.

Overall the effect of RhE seems somewhat more marked on placental weight than on birth weight. The values of eta squared (a measure of the strength of association) are the following: RhE-placental weight association 0.06 and 0.02 for normal and diabetic pregnancy respectively, RhE-birth weight association 0.04 and 0.001.

The similarity of the pattern in different population and in presence of diabetes — a situation associated with severe disturbances of intra-uterine growth — argues against a mere sampling artifact.

At present it cannot be excluded that the association with developmental parameters is due to some gene near to Rh and in linkage disequilibrium with it. The new acquisitions on the structure and the possible function of Rh proteins may suggest a causal involvement of Rh proteins on intrauterine development through its transport function.

References

[1] Gloria-Bottini, F., Gerlini, G., Lucarini, N., Amante, A., Lucarelli, P., Borgiani, P. and Bottini, E. Both maternal and foetal genetic factors contribute to macrosomia of diabetic pregnancy. *Human Heredity* **44**, (1994) 24–30.

[2] Gloria-Bottini, F., Lucarini, N., Gerlini, G., Fallucca, F. and Bottini, E. Rh-PGM1 haplotype and clinical severity of IDDM during pregnancy. *Diabetes Res.* **13**, (1990) 49–50.

[3] Telen, M.J. Erythrocyte blood group antigens: not so simple after all. *Blood* **85**, (1995) 299–306.