

CLINICAL SIGNIFICANCE OF PLACENTAL GRADING BY SONAR

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SUMMARY

Placental grading by sonar was carried out in 50 normal and 115 high risk pregnancy cases at different gestational ages. After delivery, Apgar-score, birth weight, development of RDS and neonatal outcome were correlated with placental grading. In normal cases, grading had a definite correlation with gestational age, being higher with advancing pregnancy. In high risk group, placental maturity was accelerated, being higher than normal pregnancy of similar gestational age. Cases of diabetes and Rh-incompatibility, however, showed delayed maturity of placenta and lower grades were found even in cases approaching term. Placental maturity showed a direct correlation with pulmonary maturity. Respiratory distress syndrome never developed when placenta had shown grade II or III maturity. Premature aging of placenta was an indication of decline in its function leading to intra-uterine growth retardation. Presence of grade III placenta denotes that further continuation of pregnancy entails a risk of foetal death and such cases, therefore, require close monitoring.

INTRODUCTION

Assessment of foetal maturity and the optimal time for intervention still remains an engima for the practising obste-

tricians. Sonar undoubtedly, has gone a long way providing critical informations. No single parameter, however, is efficient enough to predict foetal maturity. Maturation changes in placenta have been found to correlate with functional maturity of foetus by Grannum and Berko-

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Accepted for Publication on 21.03.1994.

witz (1979), who classified all placentae into different grades according to their ultrasonographic appearance as follows :-

Grade 0 - Placental body is homogenous. The amnio-chorionic plate is even throughout

Grade I - Placental body shows a few echogenic densities ranging from 2 to 4 mm. in diameter. These are bright white in colour and linear to comma shaped. The chorionic plate shows small indentations.

Group II - The comma like densities in placental body increase in frequency and size, Basilar calcification occurs. The chorionic plate shows marked indentations.

Grade III - The chorionic plate develops multiple indentations. Sonoluscent areas appear within placental body giving it a Swiss cheese appearance.

The present study was undertaken to find out the maturational changes in placenta at various gestational ages and their correlation with perinatal outcome including birth-weight, Apgar-score, development of R.D.S. and neonatal death.

MATERIALS AND METHODS

A total of 165 cases in the last trimester of pregnancy were studied. 50 of them had no medical or obstetrical complication and were categorised as normal group, while 115 cases having one or another medical/obstetrical complication were categorised as high risk group.

After careful history taking and a thorough clinical examination, all the patients were subjected to ultrasonographic examination to study details of foetal and placental profile. Date of

Distribution of high risk cases

Complications	No. of cases
P.I.H.	35
Postdate pregnancy	30
A.P.H.	25
Rh-Negative	6
Diabetes	9
I.U.G.R.	10
Total	115

last menstrual period was correctly known in all the cases. Placental grading was done according to Grannum classification described above. These patients were followed throughout their pregnancy, labour and postpartum period. Birth-weight, Apgar-Score and perinatal outcome were recorded and correlated with placental grading.

DISCUSSION

As evident from Table I, between 28-31 weeks all the placentae were of grade 0 in normal pregnancy. As pregnancy advanced, the placenta got more and more mature. According to Grannum and Berkowitz (1979) a placenta normally attains grade I changes at 31.1 weeks, grade II at 36.3 weeks and grade III at 38 weeks. In the present series of 25 normal term pregnancy cases, 5 had grade I, 16 had grade II and 4 had grade III placenta. In high risk group higher number of grade II and III placentae were seen as compared to normal pregnancy of corresponding gestational ages (Table II). In P.I.H. cases, accelerated maturity might be a result of utero-placental ischaemia due to abnormal vasospasm

OBSERVATIONS**Table I****Placental grading correlation with gestational age in 50 normal cases**

Placental grading	Gestational age in weeks			Total
	28 - 31	32 - 37	Above 37	
0	6	0	0	6
I	0	13	5	18
II	0	5	16	21
III	0	1	4	5
Total	6	19	25	50

Table II**Placental grading correlation with gestational age in 115 high risk cases**

Placental grading	Gestational age in weeks			Total
	28 - 31	32 - 37	Above 37	
0	2	3	0	5
I	5	12	27	44
II	2	4	27	33
III	0	3	30	33
Total	9	22	84	115

Table III**Placental grading in 9 cases of diabetes**

Placental grading	Gestational age in weeks		
	28 - 37	Above 37	Total
0	3	0	3
I	2	3	5
II	0	1	1
III	0	0	0
Total	5	4	9

Table IV**Placental grading in 6 cases of Rh-Negative**

Placental grading	Gestational age in weeks		
	28 - 37	Above 37	Total
0	0	0	0
I	2	2	4
II	0	1	1
III	0	1	1
Total	2	4	6

Table V

Placental grading : correlation with birth weight of neonates

Placental grading	Total No. of cases	Birth weight in Kg.			
		1 to 1.5	1.5 to 2	2 to 2.5	Above 2.5
0	11	2	5	2	2
I	62	3	14	34	11
II	54	1	6	17	30
III	38	1	5	6	26
Total	165	7	30	59	69

Table VI

Correlation of placental grading with Apgar score of neonates at 1 minute (165 cases)

Placental grading	Apgar score			Total
	0 - 3	4 - 6	7 - 10	
0	2	3	6	11
I	2	10	50	62
II	1	7	46	54
III	3	5	30	38
Total	8	25	132	165

Table VII

Placental grading correlation with development of Respiratory Distress Syndrome

Placental grading	Total No. of cases	Respiratory Distress Syndrome (R.D.S.)	
		Positive No.	Negative No.
0	11	5	6
I	62	3	59
II	54	0	54
III	38	0	38
Total	165	8	157

Table VIII

Placental grading correlation with development of respiratory distress syndrome (R.D.S.) in 9 cases of diabetes

Placental grading	R.D.S. Postive	R.D.S. Negative	Total
0	3	0	3
I	2	3	5
II	0	1	1
III	0	0	0
Total	5	4	9

Table IX

Placental grading correlation with perinatal death in (165 cases)

Placental grading	Total No. of cases	Still birth	Neonatal deaths
0	11	1	3
I	62	0	2
II	54	0	1
III	38	2	2
Total	165	3	8

of uterine blood vessels leading to hypoxia and to necrosis and haemorrhage in placental.

There were 9 cases of diabetes in the present series. None of them showed grade III placenta even at term (Table III). Before 37 weeks, even grade II placenta was never seen. A lag in placental maturity in diabetes has been observed by other workers too (Horman and Manning, 1982 and Grannum & Hobbins, 1982). Presence of grade 0 placenta after 32nd week of pregnancy should arouse a suspicion of diabetes and a glucose tolerance test should be performed.

There were 6 Rh-Negative cases in the present series. 2 between 32-37 weeks and 4 at term. Of term cases, 2 had grade I, 1 had grade II and 1 had grade III placenta. Both preterm cases showed grade I placenta.

Correlation of placental grading with birth weight

Since lower gestational ages showed lesser degrees of placental changes, low birth weights with lower grades of placenta (Table V) was not unexpected. When grade III changes were seen prior to 35 weeks, IUGR was common. Grade III changes thus indicate a definite

risk to foetus as placental function declines further.

Correlation of placental grading with Apgar-score

In the present series of 165 cases, 11 had shown grade 0 placenta. 5 of these neonates had Apgar-score less than 7 (Table VI). 3 of whom could not be saved even after best efforts. On the whole, higher scores were shown when placental maturity was of higher grade.

Correlation of placental grading with Respiratory Distress Syndrome (R.D.S.)

As evident from Table VII, R.D.S. never developed when placenta was grade II or III. In diabetic group (Table VIII) the Incidence of R.D.S. was high.

CONCLUSION

It is concluded that placental grading by sonar is a safe, non-invasive, but highly reliable index of functional maturity of the foetus. Grade 0 placenta is associated with high risk of R.D.S. and neonatal death, while grade III placenta indicates that termination of pregnancy should be considered.

REFERENCES

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