

# PLACENTAL GRADING BY ULTRASOUND IN POSTDATED PREGNANCY AND ITS CORRELATION WITH FOETAL OUTCOME

By

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## SUMMARY

One hundred women with postdated pregnancy i.e. pregnancy beyond 40 weeks and 40 women with normal pregnancy between 37-40 weeks were studied for placental grading by ultrasound and the findings were correlated with foetal outcome. In postdated pregnancy, the grade I, II and III placenta were found in 24% 61% and 15% of the cases respectively. Grade I placenta was found to be significantly less ( $p > 0.01$ ) but did not rule out postdated pregnancy. Prognosis as regards spontaneous labour, foetal distress and birth asphyxia was better with grade I placenta. Growth retarded babies were seen significantly more ( $p < 0.005$ ) with grade III placenta.

### Introduction

The antenatal evaluation of placental structure have been made possible by ultrasound and the ultrasonic appearance of placenta have been correlated to its maturation (Grannum and Hobbins, 1982). It was thought that placental maturity as determined by ultrasound might help in reinforcing the diagnosis of postdated pregnancy and might help in identifying the foetus at risk. This study was undertaken to study the placental grading by ultrasound in post-

dated pregnancy and its correlation to foetal outcome.

### Material and Methods

The study group comprised of 100 patients who had regular menstrual cycles, known last menstrual period, gestation of more than 40 weeks and with no obstetric or systemic complications. The control group consisted of 40 patients who fulfilled all the above criteria except that the gestation period was 37-40 weeks.

Besides detailed history and routine antenatal examination, ultrasonographic study for placental maturation was done and the placenta was graded according to classification by Grannum *et al* (1979) based on changes occurring in chorionic plate, placental substance and basal layer.

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Management of individual patient was left entirely to the treating obstetrician. These patients were followed during delivery and till discharge from the hospital. The ultrasound findings were correlated with foetal outcome. The results were analysed using chi square test.

*Observations*

*Placental grading and pattern of distribution (Table I)*

In the present study, grade I placenta was significantly lower ( $p < 0.01$ ) in the study group. No difference was found in the frequency of grade II placenta at different period of gestation after 37 weeks. Whereas grade III placenta was almost 4 times higher at  $\geq 42$  weeks.

*Placental grading and foetal distress (Table II)*

Among 140 patients, foetal distress was about two fold in cases with grade II/III placenta as compared to grade I placenta.

*Placental grading and onset of labour (Table III)*

Significantly higher number of cases had spontaneous labour with grade I/II placenta. On the other hand labour was induced significantly more in cases with grade III placenta.

*Placental grading and Birth Asphyxia (Table IV)*

Low apgar score ( $\geq 6$ ) in new borns was more in cases with grade II/III

TABLE I  
*Placental Grading—Pattern of Distribution*

|               | Total | Placental grade—I |       | Placental grade-II |       | Placental Grade —III |       |
|---------------|-------|-------------------|-------|--------------------|-------|----------------------|-------|
|               |       | No.               | %     | No.                | %     | No.                  | %     |
| Control group | 40    | 19                | 47.5  | 19                 | 47.5  | 2                    | 5     |
| Study group   | 100   | 24*               | 24    | 61                 | 61    | 15                   | 15    |
| 41 weeks      | 36    | 14                | 38.89 | 20                 | 55.56 | 2                    | 5.56  |
| 42 weeks      | 45    | 6                 | 13.33 | 30                 | 66.67 | 9                    | 20    |
| >42 weeks     | 19    | 4                 | 21.05 | 11                 | 57.89 | 4                    | 21.05 |

\* $X^2 = 7.40$   
 $P < 0.01$

TABLE II  
*Correlation of Placental Grading and Foetal Distress*

|               | Placental grade I |          |             | Placental grade II |           |              | Placental grade III |          |              |
|---------------|-------------------|----------|-------------|--------------------|-----------|--------------|---------------------|----------|--------------|
|               | Total             | F.D.     |             | Total              | F.D.      |              | Total               | F.D.     |              |
|               |                   | No.      | %           |                    | No.       | %            |                     | No.      | %            |
| Control group | 19                | 1        | 5.3         | 19                 | 2         | 10.5         | 2                   | —        | —            |
| Study group   | 24                | 3        | 12.5        | 61                 | 13        | 21.31        | 15                  | 3        | 20           |
| <b>Total</b>  | <b>43</b>         | <b>4</b> | <b>9.30</b> | <b>80</b>          | <b>15</b> | <b>18.75</b> | <b>17</b>           | <b>3</b> | <b>17.65</b> |

F.D.—Foetal distress



TABLE III

## Placental Grading and Onset of Labor

|               | Placental grade I |               |                 |            | Placental grade II |               |                  |             | Placental grade III |             |              |     |
|---------------|-------------------|---------------|-----------------|------------|--------------------|---------------|------------------|-------------|---------------------|-------------|--------------|-----|
|               | Total             | S             | I               | C/S        | Total              | S             | I                | C/S         | Total               | S           | I            | C/S |
| Control group | 19                | 18<br>(94.7)  | 1<br>(5.3)      | —          | 19                 | 18<br>(94.7)  | —                | 2<br>(10.5) | 2                   | 2<br>(100)  | —            | —   |
| Study group   | 24                | 13<br>(54.2)  | 11<br>(45.8)    | 1<br>(4.2) | 61                 | 34<br>(55.7)  | 26<br>(42.6)     | 6<br>(9.8)  | 15                  | 4<br>(26.7) | 11<br>(73.3) | —   |
| Total         | 43                | 31*<br>(72.1) | 12***<br>(27.9) | 1<br>(2.3) | 80                 | 52***<br>(65) | 26****<br>(32.5) | 8<br>(10)   | 17                  | 6<br>(35.3) | 11<br>(64.7) | —   |

S—Spontaneous

\*X<sup>2</sup> — 6.98

p &lt; 0.01

I—Induced

\*\*X<sup>2</sup> — 5.15

p &lt; 0.05

C/S—Caesarean section

\*\*\*X<sup>2</sup> — 6.98\*\*\*\*X<sup>2</sup> — 6.51

p &lt; 0.05

TABLE IV

## Placental Grade and Foetal Growth

|               | Placental grade I |     |             |                | Placental grade II |            |              |              | Placental grade III |       |     |             |              |             |
|---------------|-------------------|-----|-------------|----------------|--------------------|------------|--------------|--------------|---------------------|-------|-----|-------------|--------------|-------------|
|               | Total             | SFD | IUGR        | LFD            | Total              | SFD        | IUGR         | AGA          | LFD                 | Total | SFD | IUGR        | AGA          | LFD         |
| Control group | 19                | —   | —           | —              | 19                 | —          | 3<br>(15.8)  | 16<br>(84.2) | —                   | 2     | —   | —           | 2<br>(100)   | —           |
| Study group   | 24                | —   | 2<br>(8.3)  | 22<br>(91.7)   | 61                 | 2<br>(3.3) | 7<br>(11.5)  | 51<br>(83.6) | 1<br>(1.6)          | 15    | —   | 4<br>(26.7) | 9<br>(60)    | 2<br>(13.3) |
| Total         | 43                | —   | 2*<br>(4.6) | 41**<br>(95.4) | 80                 | 2<br>(2.5) | 10<br>(12.5) | 67<br>(83.8) | 1<br>(1.2)          | 17    | —   | 4<br>(23.5) | 11<br>(64.7) | 2<br>(11.8) |

\*X<sup>2</sup> — 4.82

p &lt; 0.05

\*\*X<sup>2</sup> — 9.9

p &lt; 0.05

placenta compared to cases with grade I placenta.

*Placental grading and foetal growth* (Table V)

Number of patients with grade III placenta had significantly increased incidence of growth retarded babies as compared to cases with grade I placenta.

*Discussion*

In this study the number of cases with grade I placenta was significantly ( $p < 0.01$ ) less in study group as compared to control group. Postdated cases with grade I placenta delivered term babies in 54.17%, preterm in 8.33% and postterm babies in 37.5% of patients. Finding a grade I placenta did not exclude post-

TABLE V  
*Placental Grading and Birth Asphyxia*

|               | Placental grade I |      |      | Placental grade II |      |      | Placental grade III |      |      |
|---------------|-------------------|------|------|--------------------|------|------|---------------------|------|------|
|               | Total             | B.A. |      | Total              | B.A. |      | Total               | B.A. |      |
|               |                   | No.  | %    |                    | No.  | %    |                     | No.  | %    |
| Control group | 19                | —    | —    | 19                 | —    | —    | 2                   | —    | —    |
| Study group   | 24                | 1    | 4.17 | 61                 | 4    | 6.56 | 15                  | 1    | 6.67 |
| Total         | 43                | 1    | 2.32 | 80                 | 4    | 5    | 17                  | 1    | 5.88 |

B.A.—Birth asphyxia.

*Placental grading and perinatal mortality*

3 Perinatal deaths occurred in cases with grade I/II placenta, cause of death being congenital anomalies, septicemia and birth asphyxia due to cord prolapse each in these 3 cases, which was not related to placental grading.

mature baby. On the contrary, Grannum and Hobbins (1982) found grade I placenta to be unusual after 42nd week of gestation. They also stated that if a case was being examined for postdated pregnancy and grade I placenta was seen the patient's dates should be seriously questioned. This was not so in our series.

TABLE VI  
*Placental Grading and Perinatal Mortality*

|               | Placental grade I |      |      | Placental grade II |      |      | Placental grade III |      |   |
|---------------|-------------------|------|------|--------------------|------|------|---------------------|------|---|
|               | Total             | P.M. |      | Total              | P.M. |      | Total               | P.M. |   |
|               |                   | No.  | %    |                    | No.  | %    |                     | No.  | % |
| Control group | 19                | —    | —    | 19                 | —    | —    | 2                   | —    | — |
| Study group   | 24                | 1    | 4.17 | 61                 | 2    | 3.28 | 15                  | —    | — |
| Total         | 43                | 1    | 2.32 | 80                 | 2    | 2.5  | 17                  | —    | — |

P.M.—Perinatal mortality.



With grade I placenta more patients went into spontaneous labour, less foetal distress was observed, less babies were asphyxiated at birth and caesarean section was less commonly performed. Thus grade I placenta augured better prognosis. Number of cases with grade III placenta had significantly more growth retarded foetuses ( $p < 0.05$ ).

Yeh *et al* (1982) found that in post-term pregnancies showing grade III placental changes there were significantly decreased placental estriol value and dysmaturity/post maturity in these infants.

In the present study perinatal death was seen in 3 cases, the causes being congenital anomalies, septicemia and birth asphyxia due to cord prolapse. Placental grading was not related to these factors.

References

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