# Ultrasound dating-curve analysis in the assessment of gestational age

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*Summary:* The accurate assessment of gestational age is very important in everyday practice. By the use of multiple regression analysis, in a longitudinal study, ultrasound dating-curves were calculated for the crown-rump length, biparietal diameter, femur length, humerus length, binocular distance and transverse cerebellar diameter. All the examined parameters showed a good statistical correlation with gestational age; however, the earlier the estimation of the gestational age, the more accurate it is. The crown-rump length has been shown as the best parameter during the first trimester. Later on, the other biometric parameters become easier and more reliable.

If determination of gestational age is required during the third trimester, the use of multiple parameters is recommended.

*Key words:* Fetal ultrasound parameters; Dating-curves.

## INTRODUCTION

Fetal biometry estimated by ultrasound is generally employed to assess gestational age, fetal growth and some fetal malformations. Accurate knowledge of fetal age is the first very important tool for the correct understanding of normal fetal growth and the detection of congenital anomalies by abnormal measurements. In fact it has been estimated that menstrual age is not reliable in 20-40% of women [1, 2] and consequently neonatal age assessment may differ markedly from that determined by the last referred period.

The most commonly used ultrasound curves are based on the fetal age as an indipendent variable and the fetal biometry as a dependent variable: these curves are defined "growth-curves". Appropriate use of these conventional ultrasound normograms should be restricted to the surveillance of fetal growth, whereas the dating of gestational age should be rejected, because it is mathematically incorrect. A frequent mistake consists in using the dependent value (biometry) to obtain the independent value (gestational age). Evaluation of gestational age from fetal dimensions requires biometry to be the independent value, and time be the dependent value: these curves are defined as "dating-curves". The most accurate method of analysing the relationship between biometry and gestational ages is by curvilinear polynomial regression analysis,

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described by mathematical formulas called polynomial equations. The current study was undertaken to evaluate a variety of fetal parameters, in order to estimate the gestational age using a mathematical model of polynomial regression analysis.

## MATERIALS AND METHODS

In a longitudinal study, ultrasound examination was performed on 152 singleton pregnant women at between 7 and 40 weeks gestation. Within this population, 72 patients were selected according to the following criteria:

1) last reliable menstrual period;

2) ultrasound follow-up at three to four week intervals for a minimum of four examinations;

3) spontaneous delivery between 38 and 42 weeks with no evidence of growth retardation or congenital anomalies;

4) patients with medical, surgical or obstetrical complications to be excluded from the study.

Ultrasound examination were done by using a real time scanner (Esaote - Ansaldo 590) with a 3.5 MHz convex transducer. The fetal parameters investigated were crown-rump length (CRL), biparietal diameter (BPD), femur length (FL), humerus length (HL), transverse cerebellar diameter (TCD) and binocular distance (BD).

The CRL was taken, placing the calipers at the outer edge of the cephalic pole and at the outer edge of the fetal rump, excluding the limb and the yolk sac. BPD was measured from the outer table of the proximal skull to the inner table of the inner skull at the level of a scanning plane including the thalami and the cavum septi pellucidi. The FL and HL were measured in the long axis from the origin to the end of the ossified shaft. The BD was obtained in a plane where the eyes are symmetrical and have the same diameter; measurements were taken from the outer to the outer edge. The TCD was measured from the longest width of the cerebellum, visualized in the posterior fossa. All measurements, expressed in millimeters, were obtained by three experienced sonographers. For each biometric parameter, intra- and interoperator variability were always below $< 10\%$.

Using a mathematical model in multiple regression analysis third polynomial equations were obtained to describe the relationship between ultrasound measurements and gestational age, in addition, for each parameter, tables using 5th hand 95th percentile, as confident limits, were calculated.

## RESULTS

In figures 1 to 6 the calculated polynomial dating curves are reported for each sonographic parameter. In table 1 the polynomial equations related to fetal biometry are summarized. Table 2 to 7 show the mean gestational age and the range of

Table 1. – *Statistical analysis data of the various biometric parameters.*

| Parameters | Polynomial Regression | F-ratio | Stnd. error | R |
|---|---|---|---|---|
| CRL | GA = 4.76 + (0.21CRL) − (0.0001CRL) + (0.0000059CRL) | 150.58 | 0.58WK | 0.87 |
| BPD | GA = 8.00 + (0.18 + BPD) + (0.0001BPD) + (0.0000031BPD) | 2675.81 | 1.37WK | 0.96 |
| FL | GA = 11.59 + (0.07FL) + (0.005FL) + (0.000027FL) | 4027.34 | 1.20WK | 0.97 |
| HL | GA = 13.60 + (0.12HL) + (0.01HL) − (0.00006HL) | 2543.65 | 1.27WK | 0.96 |
| TCD | GA = 1.50 + (1.37TCD) − (0.02TCD) + 0.00013TCD | 800.87 | 1.09WK | 0.95 |
| BD | GA = 1.53 + (1.24BD) − (0.02BD) + 0.00033BD | 103.85 | 2.55WK | 0.81 |

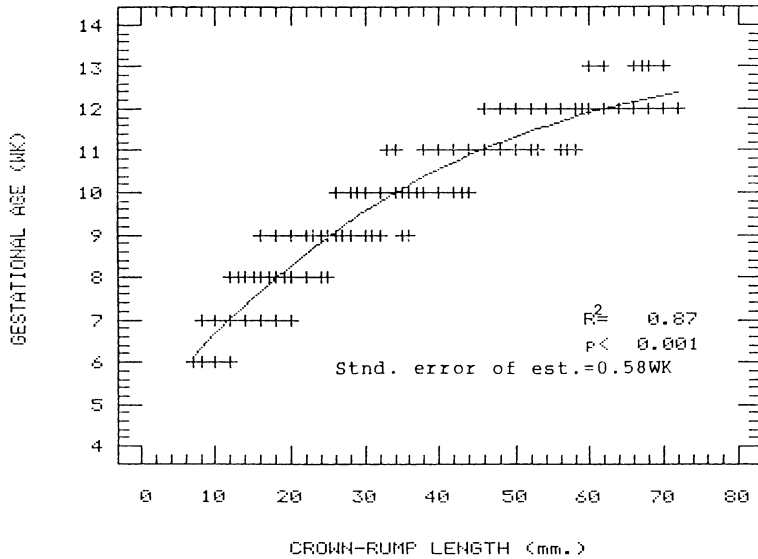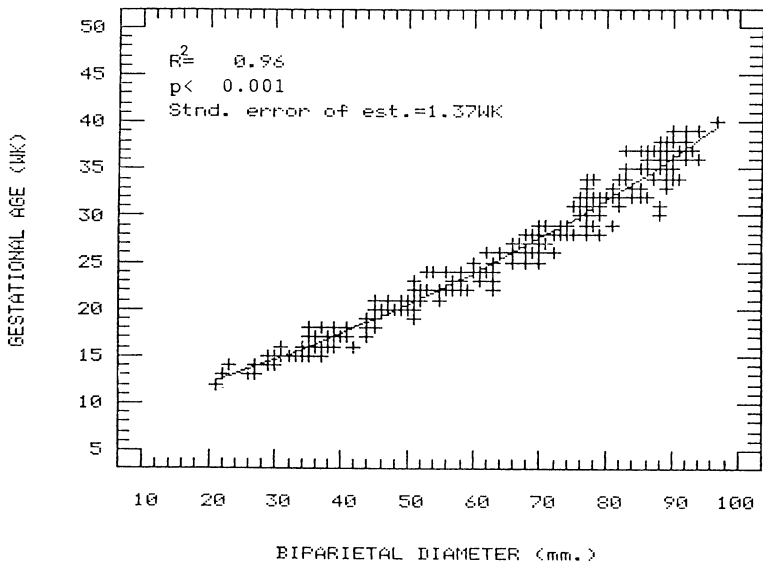Fig. 1. — Polynomial regression dating curve of crown-rump length.

Fig. 2. — Polynomial regression dating curve of biparietal diameter.
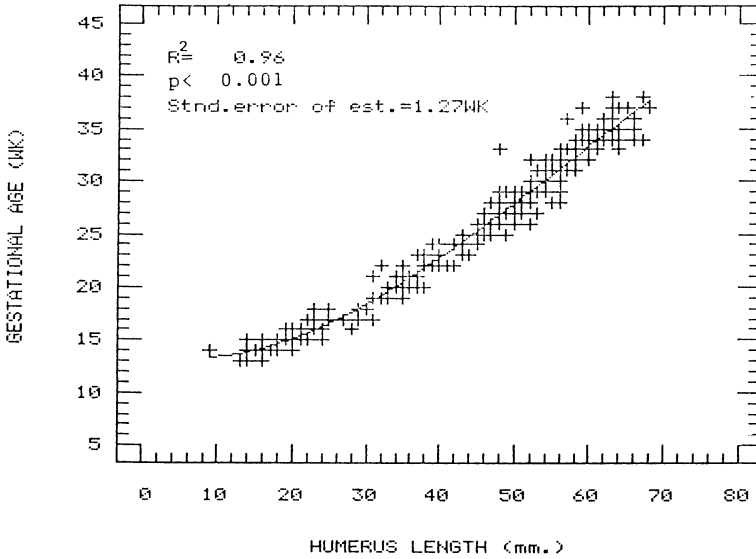
Fig. 3. — Polynomial regression dating curve of humerus length.
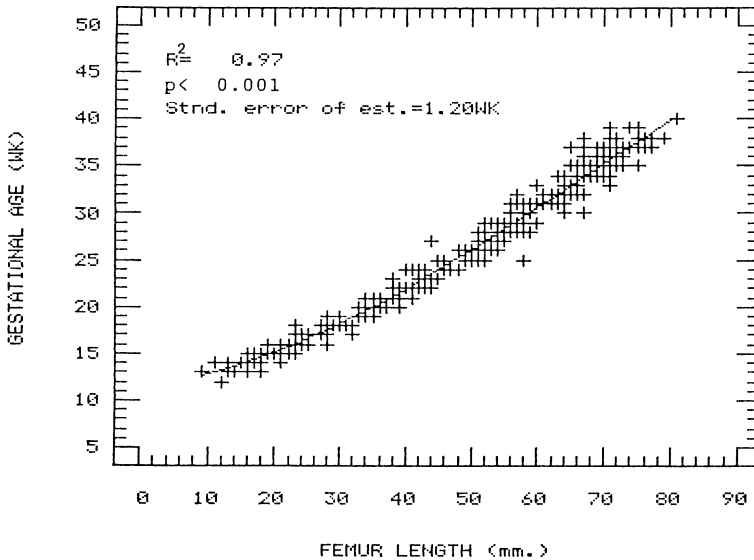


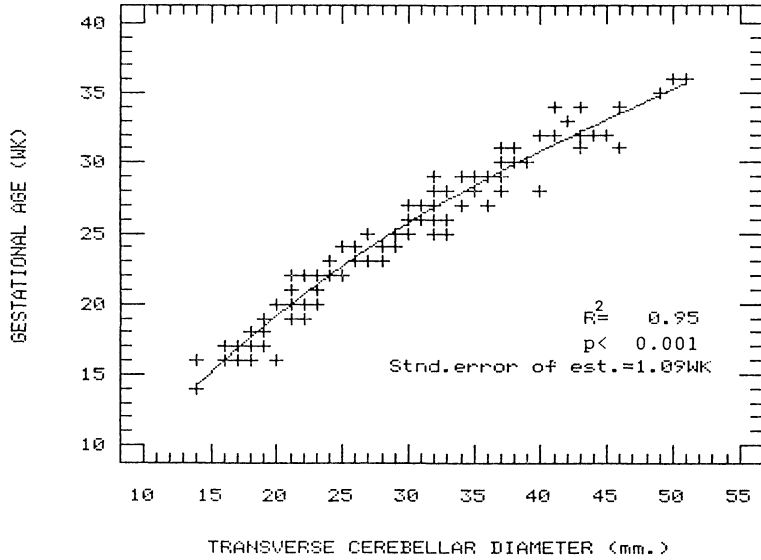Fig. 4. — Polynomial regression dating curve of femur length.

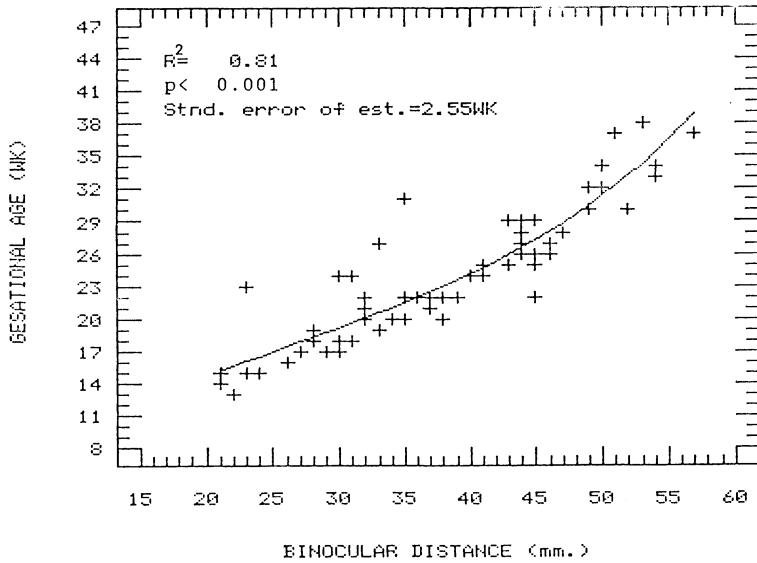Fig. 5. — Polynomial regression dating curve of transverse cerebellum diameter.



Fig. 6. — Polynomial regression dating curve of binocular distance.

Table 2. – *Assessment of the gestational age from the crown rump length.*

| mm | Gestational Age Percentile | | | mm | Gestational Age Percentile | | |
|---|---|---|---|---|---|---|---|
| | 5th | 50th | 95th | | 5th | 50th | 95th |
| 7 | 6+0 | 6+3 | 6+6 | 34 | 10+1 | 10+4 | 11+3 |
| 8 | 6+1 | 6+4 | 7+0 | 35 | 10+2 | 10+6 | 11+4 |
| 9 | 6+3 | 6+5 | 7+1 | 36 | 10+3 | 10+6 | 11+5 |
| 10 | 6+5 | 7+0 | 7+3 | 37 | 10+4 | 11+0 | 11+5 |
| 11 | 6+6 | 7+2 | 7+4 | 38 | 10+4 | 11+1 | 11+6 |
| 12 | 7+0 | 7+4 | 8+0 | 39 | 10+5 | 11+2 | 12+0 |
| 13 | 7+2 | 7+6 | 8+4 | 40 | 10+5 | 11+2 | 12+2 |
| 14 | 7+3 | 8+0 | 8+5 | 41 | 10+5 | 11+4 | 12+3 |
| 15 | 7+4 | 8+1 | 8+6 | 42 | 10+6 | 11+5 | 12+3 |
| 16 | 7+5 | 8+2 | 8+6 | 43 | 11+0 | 11+5 | 12+4 |
| 17 | 8+0 | 8+2 | 9+0 | 44 | 11+0 | 11+6 | 12+5 |
| 18 | 8+1 | 8+3 | 9+1 | 45 | 11+1 | 11+6 | 12+5 |
| 19 | 8+2 | 8+4 | 9+2 | 46 | 11+2 | 12+0 | 12+6 |
| 20 | 8+3 | 8+5 | 9+3 | 47 | 11+3 | 12+1 | 12+6 |
| 21 | 8+4 | 8+6 | 9+4 | 48 | 11+3 | 12+2 | 13+0 |
| 22 | 8+5 | 8+6 | 9+5 | 49 | 11+4 | 12+3 | 13+0 |
| 23 | 8+5 | 9+0 | 9+6 | 50 | 11+5 | 12+4 | 13+2 |
| 24 | 8+6 | 9+2 | 10+0 | 51 | 11+5 | 12+4 | 13+2 |
| 25 | 9+0 | 9+2 | 10+2 | 52 | 11+6 | 12+5 | 13+3 |
| 26 | 9+0 | 9+3 | 10+2 | 53 | 12+0 | 12+6 | 13+3 |
| 27 | 9+2 | 9+5 | 10+3 | 54 | 12+2 | 13+0 | 13+4 |
| 28 | 9+4 | 10+0 | 10+4 | 55 | 12+2 | 13+1 | 13+4 |
| 29 | 9+4 | 10+1 | 10+5 | 56 | 12+3 | 13+2 | 13+5 |
| 30 | 9+5 | 10+2 | 10+6 | 57 | 12+4 | 13+2 | 13+6 |
| 31 | 9+5 | 10+3 | 11+0 | 58 | 12+5 | 13+3 | 13+6 |
| 32 | 9+6 | 10+3 | 11+1 | 59 | 12+5 | 13+3 | 14+0 |
| 33 | 10+0 | 10+4 | 11+2 | 60 | 12+6 | 13+4 | 14+1 |

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gestational ages for all ultrasound measurements. We looked for the optimal polynomial model on the basis of maximal coefficient of determination ($R^2$) and coefficients different from 0. A p value $< 0.05$ was considered to indicate statistical significance.

CONCLUSIONS

Our results indicate that all tested ultrasound measurements show an optimal statistical correlation with gestational age.

The CRL is confirmed as the best parameter to establish gestational age in early pregnancy. A CRL of 10 mm presents a variability of $\pm$ 3 days (from 6 wks + 5 days to 1 wks + 4 days); when it reaches 45 mm the variability is of $\pm$ 6 days (from 11 wks + 1 day to 12 wks + 5 days).

The other biometric parameters become more easily reliable from the end of the first trimester onwards.

Their accuracy in predicting gestational age is high until the end of the second

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Table 3. – *Assessment of the gestational age from the biparietal diameter.*

| mm | Gestational Age Percentile | | | mm | Gestational Age Percentile | | |
|---|---|---|---|---|---|---|---|
| | 5th | 50th | 95th | | 5th | 50th | 95th |
| 21 | 10+3 | 12+3 | 13+3 | 59 | 22+3 | 23+3 | 24+6 |
| 22 | 10+5 | 12+5 | 13+6 | 60 | 22+6 | 23+5 | 25+1 |
| 23 | 11+0 | 13+0 | 14+1 | 61 | 23+0 | 23+6 | 25+2 |
| 24 | 11+3 | 13+1 | 14+6 | 62 | 23+2 | 24+4 | 25+4 |
| 25 | 11+6 | 13+3 | 15+1 | 63 | 23+5 | 25+1 | 25+6 |
| 26 | 12+3 | 13+5 | 15+2 | 64 | 24+2 | 25+3 | 26+2 |
| 27 | 12+5 | 13+6 | 15+2 | 65 | 24+3 | 25+5 | 26+4 |
| 28 | 13+0 | 14+0 | 15+3 | 66 | 25+2 | 26+2 | 27+0 |
| 29 | 13+3 | 14+3 | 15+4 | 67 | 26+0 | 26+3 | 27+2 |
| 30 | 14+0 | 14+4 | 15+4 | 68 | 26+0 | 26+4 | 28+0 |
| 31 | 14+0 | 14+6 | 16+1 | 69 | 26+3 | 27+1 | 28+0 |
| 32 | 14+3 | 15+2 | 16+3 | 70 | 26+4 | 27+2 | 28+4 |
| 33 | 14+3 | 15+3 | 16+4 | 71 | 27+2 | 27+5 | 29+0 |
| 34 | 15+0 | 15+5 | 16+5 | 72 | 27+2 | 27+5 | 29+0 |
| 35 | 15+3 | 16+2 | 17+0 | 73 | 27+5 | 28+5 | 29+2 |
| 36 | 15+4 | 16+2 | 17+0 | 74 | 28+0 | 28+5 | 29+5 |
| 37 | 15+4 | 16+4 | 17+6 | 75 | 28+1 | 29+5 | 30+3 |
| 38 | 16+0 | 16+6 | 18+0 | 76 | 29+0 | 30+1 | 31+0 |
| 39 | 16+2 | 17+2 | 18+0 | 77 | 29+2 | 30+6 | 32+0 |
| 40 | 16+3 | 17+3 | 18+1 | 78 | 29+3 | 31+0 | 32+0 |
| 41 | 16+5 | 17+4 | 18+3 | 79 | 29+5 | 31+0 | 32+1 |
| 42 | 16+6 | 17+6 | 18+5 | 80 | 30+0 | 31+2 | 32+6 |
| 43 | 17+0 | 18+0 | 18+6 | 81 | 30+1 | 32+0 | 33+0 |
| 44 | 17+2 | 18+3 | 19+1 | 82 | 31+1 | 32+1 | 34+4 |
| 45 | 17+3 | 18+5 | 20+3 | 83 | 31+4 | 32+5 | 35+0 |
| 46 | 18+0 | 19+0 | 20+6 | 84 | 32+0 | 32+6 | 35+2 |
| 47 | 18+2 | 19+4 | 21+2 | 85 | 32+4 | 34+0 | 36+0 |
| 48 | 19+0 | 20+0 | 21+5 | 86 | 32+4 | 34+2 | 36+3 |
| 49 | 19+2 | 20+3 | 21+6 | 87 | 33+1 | 34+4 | 37+0 |
| 50 | 19+6 | 20+4 | 21+6 | 88 | 33+2 | 35+2 | 37+5 |
| 51 | 19+6 | 20+6 | 22+2 | 89 | 33+4 | 35+5 | 38+0 |
| 52 | 20+1 | 21+3 | 22+6 | 90 | 34+1 | 36+3 | 38+4 |
| 53 | 20+6 | 21+5 | 23+0 | 91 | 34+2 | 36+5 | 38+4 |
| 54 | 21+0 | 21+5 | 23+5 | 92 | 36+0 | 37+2 | 39+0 |
| 55 | 21+0 | 21+6 | 24+0 | 93 | 36+3 | 37+3 | 39+3 |
| 56 | 21+4 | 22+2 | 24+0 | 94 | 36+6 | 38+0 | 39+5 |
| 57 | 22+0 | 23+0 | 24+2 | 95 | 37+2 | 38+2 | 39+6 |
| 58 | 22+1 | 23+3 | 24+5 | | | | |

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Table 4. – *Assessment of the gestational age from the humerus length.*

| mm | Gestational Age Percentile | | | mm | Gestational Age Percentile | | |
|---|---|---|---|---|---|---|---|
| | 5th | 50th | 95th | | 5th | 50th | 95th |
| 13 | 11+4 | 13+5 | 15+5 | 41 | 22+3 | 23+6 | 25+3 |
| 14 | 12+0 | 14+0 | 16+2 | 42 | 22+4 | 24+0 | 25+6 |
| 15 | 13+2 | 14+0 | 16+3 | 43 | 23+5 | 24+4 | 26+0 |
| 16 | 13+3 | 14+2 | 16+5 | 44 | 23+5 | 25+0 | 26+5 |
| 17 | 13+3 | 14+4 | 16+5 | 45 | 24+0 | 25+5 | 27+3 |
| 18 | 13+6 | 15+0 | 16+6 | 46 | 24+4 | 26+3 | 28+0 |
| 19 | 14+0 | 15+3 | 17+1 | 47 | 25+0 | 26+6 | 28+4 |
| 20 | 14+2 | 15+5 | 17+4 | 48 | 25+3 | 27+2 | 29+2 |
| 21 | 14+3 | 16+0 | 17+5 | 49 | 25+5 | 27+6 | 29+6 |
| 22 | 15+0 | 16+5 | 18+0 | 50 | 26+0 | 28+3 | 30+3 |
| 23 | 15+3 | 17+2 | 18+2 | 51 | 27+4 | 28+6 | 30+6 |
| 24 | 15+5 | 17+4 | 18+5 | 52 | 27+6 | 29+3 | 31+4 |
| 25 | 16+1 | 18+0 | 19+2 | 53 | 28+1 | 29+5 | 32+1 |
| 26 | 16+3 | 18+1 | 19+4 | 54 | 28+3 | 30+6 | 32+5 |
| 27 | 16+6 | 18+4 | 20+0 | 55 | 28+5 | 31+3 | 33+2 |
| 28 | 17+2 | 18+5 | 20+4 | 56 | 29+1 | 31+6 | 34+0 |
| 29 | 17+5 | 18+6 | 21+1 | 57 | 29+6 | 32+5 | 34+6 |
| 30 | 18+0 | 19+1 | 21+4 | 58 | 30+4 | 33+0 | 35+2 |
| 31 | 18+3 | 19+4 | 21+6 | 59 | 31+5 | 33+4 | 36+0 |
| 32 | 18+5 | 19+6 | 22+0 | 60 | 32+2 | 34+0 | 36+3 |
| 33 | 18+6 | 20+5 | 22+3 | 61 | 33+0 | 34+4 | 37+1 |
| 34 | 19+0 | 21+0 | 22+4 | 62 | 33+3 | 35+2 | 37+6 |
| 35 | 19+1 | 21+3 | 22+5 | 63 | 33+5 | 36+1 | 38+0 |
| 36 | 19+3 | 21+5 | 23+0 | 64 | 34+0 | 36+5 | 38+3 |
| 37 | 19+6 | 22+0 | 23+2 | 65 | 34+4 | 37+1 | 39+5 |
| 38 | 20+5 | 22+3 | 23+5 | 66 | 35+0 | 37+4 | 40+0 |
| 39 | 21+3 | 23+0 | 24+2 | 67 | 35+4 | 38+0 | 40+5 |
| 40 | 21+5 | 23+3 | 24+6 | 68 | 36+3 | 38+5 | 41+3 |

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trimester. Later, difference between fetal size and fetal age increases.

For example, a BPD of 30 mm has an estimated error of ± 5 days, whereas a BPD of 85 mm has an estimated error of ± 12 days. Femur and humerus measurements are as accurate as those of the biparietal diameter.

Measurements of BD and of TCD provide an excellent correlation with gestational age ([3, 4]). They can be usefully employed when the position of the fetal head does not permit a satisfactory biparietal diameter measurement, as well as in biometric studies of some fetal malformations (neural tube defect, Down syndrome).

The combined use of multiple parameters can be recommended ([5]). In fact, the presence of a defect of fetal long bones or of cranial development can lead to a wrong estimation of gestational age, if they have been separately evaluated.

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Table 5. – *Assessment of the gestational age from the femur length.*

| mm | Gestational Age Percentile | | | mm | Gestational Age Percentile | | |
|---|---|---|---|---|---|---|---|
| | 5th | 50th | 95th | | 5th | 50th | 95th |
| 9 | 10+4 | 12+4 | 13+3 | 45 | 23+3 | 24+3 | 26+2 |
| 10 | 10+6 | 13+0 | 13+5 | 46 | 23+5 | 25+0 | 26+3 |
| 11 | 11+0 | 13+1 | 13+6 | 47 | 24+0 | 25+3 | 26+6 |
| 12 | 12+0 | 13+3 | 14+0 | 48 | 24+1 | 25+4 | 27+0 |
| 13 | 12+4 | 13+4 | 14+3 | 49 | 24+5 | 25+6 | 27+3 |
| 14 | 13+0 | 13+5 | 14+4 | 50 | 25+1 | 26+0 | 27+4 |
| 15 | 13+1 | 14+0 | 15+2 | 51 | 25+3 | 26+5 | 28+2 |
| 16 | 13+6 | 14+2 | 15+2 | 52 | 25+5 | 27+0 | 29+0 |
| 17 | 14+1 | 14+4 | 15+3 | 53 | 26+2 | 27+4 | 29+1 |
| 18 | 14+3 | 14+6 | 15+4 | 54 | 26+6 | 27+6 | 29+4 |
| 19 | 14+5 | 15+2 | 16+1 | 55 | 27+4 | 28+0 | 30+1 |
| 20 | 15+0 | 15+4 | 16+2 | 56 | 27+6 | 28+5 | 30+5 |
| 21 | 15+1 | 15+5 | 17+0 | 57 | 28+0 | 29+1 | 31+0 |
| 22 | 15+3 | 16+0 | 17+2 | 58 | 28+1 | 29+5 | 31+5 |
| 23 | 15+5 | 16+1 | 18+0 | 59 | 28+6 | 30+0 | 32+0 |
| 24 | 16+2 | 16+4 | 18+1 | 60 | 29+3 | 30+4 | 32+4 |
| 25 | 16+3 | 17+2 | 18+3 | 61 | 30+3 | 31+3 | 32+6 |
| 26 | 16+6 | 17+5 | 18+4 | 62 | 31+0 | 31+6 | 33+2 |
| 27 | 17+1 | 18+1 | 18+5 | 63 | 31+2 | 32+2 | 34+5 |
| 28 | 17+5 | 18+2 | 19+0 | 64 | 31+5 | 32+5 | 34+6 |
| 29 | 17+6 | 18+4 | 19+3 | 65 | 32+0 | 33+0 | 35+2 |
| 30 | 18+3 | 19+0 | 19+6 | 66 | 32+4 | 33+3 | 35+6 |
| 31 | 18+4 | 19+3 | 20+1 | 67 | 33+2 | 34+3 | 36+3 |
| 32 | 18+5 | 19+5 | 20+4 | 68 | 33+5 | 35+0 | 36+6 |
| 33 | 19+0 | 20+0 | 21+0 | 69 | 34+0 | 35+4 | 37+1 |
| 34 | 19+1 | 20+4 | 21+5 | 70 | 34+1 | 36+0 | 37+3 |
| 35 | 19+3 | 21+0 | 22+3 | 71 | 34+4 | 36+3 | 38+0 |
| 36 | 20+1 | 21+5 | 22+5 | 72 | 34+6 | 36+4 | 38+2 |
| 37 | 20+5 | 21+6 | 22+6 | 73 | 35+0 | 37+0 | 38+5 |
| 38 | 21+0 | 22+2 | 23+5 | 74 | 35+4 | 37+0 | 39+3 |
| 39 | 21+0 | 22+4 | 24+0 | 75 | 36+0 | 37+5 | 39+3 |
| 40 | 21+3 | 22+5 | 24+2 | 76 | 36+5 | 38+0 | 39+5 |
| 41 | 21+6 | 22+6 | 24+5 | 77 | 37+2 | 38+2 | 40+0 |
| 42 | 22+2 | 23+0 | 25+2 | 78 | 37+5 | 38+5 | 40+2 |
| 43 | 22+5 | 23+4 | 25+4 | 79 | 38+1 | 39+0 | 40+5 |
| 44 | 23+0 | 24+0 | 26+0 | 80 | 38+3 | 39+5 | 41+4 |

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When in the bone-derived gestational age, there is a difference greater than 7 days with the BPD- derived gestational age, a careful study of fetal morphology must be performed.

In conclusion we have shown how, by the use of a mathematically correct model, the relationship between fetal biometry and gestational age can best be ascertained. The possibility of having precise models to

Table 6. – *Assessment of the gestational age from the transverse cerebellum diameter.*

| mm | Gestational Age Percentile | | |
|---|---|---|---|
| | 5th | 50th | 95th |
| 14 | 13+1 | 14+4 | 16+0 |
| 15 | 13+5 | 15+2 | 16+5 |
| 16 | 14+6 | 16+1 | 17+3 |
| 17 | 15+3 | 16+5 | 18+0 |
| 18 | 16+3 | 17+4 | 18+6 |
| 19 | 17+4 | 18+3 | 19+3 |
| 20 | 18+0 | 19+3 | 20+6 |
| 21 | 18+4 | 20+0 | 22+0 |
| 22 | 19+1 | 21+0 | 22+6 |
| 23 | 20+0 | 21+3 | 23+0 |
| 24 | 21+0 | 22+1 | 23+2 |
| 25 | 21+3 | 22+4 | 24+2 |
| 26 | 22+1 | 23+3 | 24+5 |
| 27 | 22+4 | 24+0 | 25+3 |
| 28 | 23+2 | 24+4 | 25+5 |
| 29 | 24+2 | 25+2 | 26+1 |
| 30 | 24+6 | 26+1 | 27+2 |
| 31 | 25+1 | 26+3 | 27+4 |
| 32 | 25+4 | 27+0 | 28+3 |
| 33 | 26+2 | 27+4 | 28+5 |
| 34 | 26+6 | 28+1 | 29+3 |
| 35 | 27+0 | 28+3 | 29+5 |
| 36 | 27+3 | 28+6 | 30+2 |
| 37 | 27+6 | 29+1 | 30+3 |
| 38 | 28+2 | 30+0 | 30+6 |
| 39 | 28+5 | 30+2 | 31+5 |
| 40 | 29+2 | 30+4 | 32+0 |
| 41 | 29+5 | 31+0 | 32+2 |
| 42 | 30+4 | 31+6 | 33+2 |
| 43 | 30+5 | 32+1 | 33+6 |
| 44 | 32+2 | 32+6 | 34+0 |
| 45 | 32+4 | 33+1 | 34+2 |
| 46 | 32+5 | 33+4 | 34+5 |
| 47 | 33+1 | 34+2 | 35+3 |
| 48 | 33+3 | 34+6 | 35+6 |
| 49 | 34+0 | 35+0 | 36+0 |
| 50 | 34+2 | 35+2 | 36+2 |
| 51 | 34+6 | 36+0 | 37+1 |

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Table 7. – *Assessment of the gestational age from the binocular distance.*

| mm | Gestational Age Percentile | | |
|---|---|---|---|
| | 5th | 50th | 95th |
| 21 | 12+5 | 13+5 | 15+0 |
| 22 | 13+6 | 14+2 | 15+4 |
| 23 | 14+2 | 14+6 | 16+1 |
| 24 | 14+5 | 15+3 | 16+4 |
| 25 | 15+1 | 16+0 | 17+1 |
| 26 | 15+4 | 16+4 | 17+5 |
| 27 | 16+0 | 17+3 | 18+3 |
| 28 | 17+1 | 18+0 | 19+2 |
| 29 | 17+5 | 18+2 | 19+5 |
| 30 | 18+0 | 18+5 | 21+0 |
| 31 | 18+3 | 19+4 | 21+6 |
| 32 | 19+0 | 20+3 | 22+1 |
| 33 | 19+6 | 21+2 | 22+6 |
| 34 | 20+2 | 21+5 | 23+2 |
| 35 | 20+6 | 22+2 | 23+6 |
| 36 | 21+3 | 22+6 | 24+4 |
| 37 | 21+5 | 23+2 | 25+1 |
| 38 | 22+2 | 24+0 | 25+5 |
| 39 | 22+6 | 24+4 | 26+3 |
| 40 | 23+1 | 25+0 | 26+6 |
| 41 | 23+5 | 25+3 | 27+3 |
| 42 | 24+5 | 26+3 | 28+1 |
| 43 | 25+0 | 27+0 | 28+5 |
| 44 | 25+2 | 27+1 | 29+2 |
| 45 | 26+0 | 28+3 | 29+6 |
| 46 | 26+3 | 28+6 | 30+3 |
| 47 | 27+1 | 29+3 | 30+6 |
| 48 | 27+6 | 30+0 | 32+0 |
| 49 | 28+4 | 31+3 | 32+6 |
| 50 | 29+6 | 32+0 | 33+3 |
| 51 | 30+2 | 32+3 | 34+2 |
| 52 | 30+6 | 33+0 | 35+3 |
| 53 | 31+3 | 33+5 | 36+2 |
| 54 | 32+0 | 34+1 | 37+0 |
| 55 | 32+2 | 34+3 | 37+4 |

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estimate gestational age is, in our opinion, of great importance when clinicians have to decide on the timing of several situations such as prenatal diagnostic procedures, delivery and legal abortion.

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