Relationship between preterm delivery and maternal height in teenage pregnancies

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A retrospective study was performed in 613 singleton pregnancies born to mothers aged ≤19 years over a 4-year period to determine the relationship between maternal height and preterm delivery (<37 weeks). The pregnancies were grouped according to maternal height quartiles for comparison of maternal and infant characteristics, obstetric complications and pregnancy outcome. The incidences of preterm delivery and labour decreased from 17.5% and 15.6% respectively in the lowest quartile, to 8.5% and 7.1% respectively in the highest quartile, without any difference in the risk factors or major complications. In the pregnancies without major complications, which included 73.3% of the cases of preterm labour, the rate of preterm labour was significantly and inversely correlated with the height quartiles. In the newborns, gestational age, birthweight and crown–heel length increased with the higher quartiles, but the ratio between infant crown–heel length and maternal height (height ratio) decreased with the higher quartiles. Unlike birthweight and crown–heel length, the height ratio was not correlated with gestational age. Our findings suggested that the inherent risk of preterm delivery in teenagers was related to their immature physical development at the time of pregnancy, as reflected by the maternal height.

Key words: height/preterm labour/teenage pregnancy

Introduction

The traditional belief that teenage pregnancy belongs to a high-risk category has been challenged by the results of recent studies. In teenage mothers, improvement in socio-economic situation has reduced perinatal mortality (Olausson et al., 1997) and improved prenatal care has decreased the incidences of preterm delivery and low-birthweight infants (Scholl et al., 1987). Indeed, there are accumulating data to show that, with appropriate psychosocial support and prenatal care, the obstetric outcome in teenage mothers would be comparable with, or even better than, that in older mothers (Bradford and Giles, 1989; Gale et al., 1989; Creatsas et al., 1991; Mahfouz et al., 1995; Lao and Ho, 1997; Olausson et al., 1997).

Nevertheless, the incidence of preterm labour in teenage pregnancies remained higher compared with the general population (Scholl et al., 1987; Zhang and Chan, 1991; Fraser et al., 1995; Lang et al., 1996; Perry et al., 1996; Plockinger et al., 1996; Lao and Ho, 1997; Olausson et al., 1997). Furthermore, the incidence of preterm birth was inversely correlated with maternal age, being highest in the 13- to 15-years age group, and preterm birth was the major cause of the neonatal and postneonatal mortality (Olausson et al., 1999). Thus, it is clear that any further improvement in the infant outcome in teenage pregnancies would be dependent on a better understanding of the causes of, and hence the treatment for, preterm births.

It has been shown that the inherent risk of preterm delivery in teenage mothers was independent of sociodemographic factors (Fraser et al., 1995). On the other hand, the actual maternal age appears to be a major determinant, and the risk of preterm birth was greater in mothers aged 13–15 years compared with those aged 16–17 years and 18–19 years (Fraser et al., 1995; Olausson et al., 1999). However, while the association between preterm birth and a young maternal age could be attributed to biological immaturity, the clinical parameter which represents this immaturity, and its relationship with the duration of gestation, are yet to be defined.

As teenagers are still in a period of rapid growth and development, the height attained at the time of pregnancy could be an indicator of biological maturity. Although an earlier study had found that there was no evidence of pregnant teenagers being still in a period of rapid growth during pregnancy (Garn et al., 1984), a later study demonstrated that young (<16 years of age) nulliparas were shorter and weighed less when compared with themselves at the second pregnancy (Sukanich et al., 1986). Furthermore, linear growth has been demonstrated in both primigravidae aged 12–15 years, and multigravidae aged 15–18 years (Scholl et al., 1988). Maternal height per se could be an important factor for preterm birth, as the duration of pregnancy has been shown to be related to maternal height (Mongelli and Opatola, 1995), and shorter mothers tend to give birth to symmetrically smaller infants with no difference in the ponderal index (Witter and Luke, 1991). It was possible therefore that the gestation at spontaneous onset of labour had represented the biologically destined ‘term’ for these individuals on account of their physical development, even though the gestational age was less than 37 weeks gestation.

In order to determine whether preterm delivery was related to maternal height at the time of pregnancy in teenage women, we have performed a retrospective study on the pregnancies of mothers aged 19 years and below, who delivered in our
hospital over a 4-year period. The height of these mothers was
analysed, and maternal characteristics and pregnancy outcome
were compared, according to the maternal height quartiles. We
have also examined some of the factors that have been
associated with preterm labour, such as pre-pregnant weight
and body mass index (BMI), incidence of nulliparity, previous
history of therapeutic abortion and maternal nutritional status
as represented by the haemoglobin level at booking and the
incidence of iron-deficiency anaemia (Kaltreider and Kohl,
1980; Lang et al., 1996; Hickey et al., 1997; Cnattingius
et al., 1998).

Materials and methods
In our territory, teenage mothers are defined by a maternal age of 19
years or less at delivery. As described previously (Lao and Ho, 1997),
all our local residents can enjoy free obstetric care, and social support
is readily available. Our hospital is a tertiary referral centre catering
for in-utero transfer from 24 weeks gestation. The management of
pregnancy, labour and delivery in teenage mothers have been described
in detail previously (Lao and Ho, 1997). For all mothers, interventions
are performed for medical indications, and social indications are
generally not considered.

In a retrospective study, using maternal age at delivery to define
the study cases, the case records of all teenage mothers with singleton
pregnancies who delivered in our hospital over a 4-year period (1994–
1997) were retrieved for review. Only the pregnancies in which the
gestational age was confirmed with ultrasound scanning and paediatric
assessment after delivery were included in the analysis.

In the analysis, the maternal height quartiles were first determined
and the pregnancies grouped according to the quartiles. The maternal
characteristics including the pre-pregnant weight and calculated BMI,
infant outcome and the incidence of preterm labour (spontaneous
onset of labour resulting in delivery before 37 completed weeks),
were compared among the groups. We have examined maternal BMI
in this study because it has been shown that a pre-pregnant BMI of
<19.7 kg/m² was associated with increased risk of late (33–36 weeks)
preterm delivery and preterm labour (Hickey et al., 1997). The
complications that could be associated with preterm delivery (delivery
before 37 weeks gestation) such as antepartum haemorrhage, prelabour
rupture of membranes (rupture of membranes for more than 1 hour
before labour), pre-eclampsia, and gestational diabetes mellitus as
defined by the World Health Organization criteria and including both
the categories of impaired glucose tolerance and diabetes mellitus
(World Health Organization, 1980), were also analysed similarly. In order
to test the hypothesis that the fetal size relative to that of the
mother is also a determinant of gestational duration, the ratio between
the infant crown–heel length and maternal height was calculated as
the height ratio and compared.

Statistical analysis was performed using the one-way analysis of
variance (ANOVA) test for continuous variables with Duncan’s
multiple range test to identify the different groups, \( \chi^2 \) test for
categorical variables, Pearson’s correlation coefficient (\( r \)) and multiple
regression analysis using a commercial statistical package (SPSS/PC;
SPSS Inc., Chicago, IL, USA).

Results
During the study period, there were 20 196 deliveries, and
1600 (7.9%) were before 37 weeks gestation. After excluding
the teenage pregnancies, the overall incidence of preterm
delivery for singleton and multifetal pregnancies was 7.75% (1517/19 572). Of the 624 teenage mothers who delivered
during the study period, 11 had unconfirmed gestational age
and were excluded from the analysis. These were mothers
with late attendance and unsure last menstrual period, in whom
fetal maturity could not be assessed before delivery. Among
the remaining 613 mothers, the mean gestational age at delivery
was 38.6 weeks (range: 25 to 42 weeks). Overall, 83 (13.5%)
mothers delivered before 37 weeks, with two (0.3%) before
28 weeks, three (0.5%) between 29 and 30 weeks, four (0.7%)
between 31 and 32 weeks, and 74 (12.1%) between 33 and
36 weeks. The majority of the preterm deliveries (75/83;
90.4%) was the result of preterm labour. Among the cases of
preterm labour, 55/75 (73.3%) were not associated with any of
the following complications, namely antepartum haemorrhage,
prelabour rupture of membranes, iron-deficiency anaemia, pre-
eclampsia or gestational diabetes mellitus. These cases were
all delivered between 33 and 36 weeks gestation.

The maternal heights at the 25th, 50th and 75th percentiles
were 152, 156 and 160 cm respectively. When analysed
according to the height quartiles, there was no difference in
the mean maternal age, but there was significantly increasing
weight and decreasing BMI with the higher quartiles (Table I).
The haemoglobin level was also significantly lower in the two
lower quartiles. There was no difference in the incidence of
nulliparous mothers.

Except for iron-deficiency anaemia, no significant difference
in the incidence of married mothers, previous induced abor-
tions, smokers, antepartum haemorrhage, prelabour rupture
of membranes, pre-eclampsia, sexually transmitted diseases or
gestational diabetes mellitus was demonstrated among the
different groups (Table II). In contrast, both the incidence
of preterm labour and preterm delivery was significantly different
among the four groups, with the incidence being similarly
higher in the two lower quartiles—a trend that was significantly
and inversely correlated with the quartiles. There was, however,
no significant difference in the incidence of Caesarean section.

When the infant outcome was examined, there was a trend of
increasing gestational age and infant BMI with the higher
quarters, although the difference failed to reach statistical
significance (Table III). There was, however, significantly
increased birthweight and crown–heel length with the higher
quarters. There was a highly significant decrease in the height
ratio with the higher quarters, and the ratio was significantly
different between the groups. While there was a decreasing
incidence of admission into the neonatal unit with the higher
the height ratio and compared.

In order to determine if there was any difference among the
four quartiles in the uncomplicated pregnancies, the analysis
was repeated with the exclusion of pregnancies complicated
with antepartum haemorrhage, iron-deficiency anaemia, pre-
labour rupture of membranes, gestational diabetes mellitus and
pre-eclampsia (Table IV). There was no difference in the
maternal age, but there was significantly increasing weight
and decreasing BMI with the higher quartiles. There was also
a similar but highly significant increase in gestational age,
birthweight and crown–heel length with the higher quartiles,
but the height ratio showed a significant decrease. The incidence
Gestation duration and maternal height in teenagers

### Table I. Maternal demographics in relation to height quartiles in teenage pregnancies

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Height quartilesa</th>
<th>Group 1 (25% or ≤25%)</th>
<th>Group 2 (26–50%)</th>
<th>Group 3 (51–75%)</th>
<th>Group 4 (&gt;75%)</th>
<th>P (one-way ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of women</td>
<td>159</td>
<td>161</td>
<td>153</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal age (years)</td>
<td>17.2 ± 1.5</td>
<td>17.2 ± 1.5</td>
<td>17.5 ± 1.5</td>
<td>17.5 ± 1.3</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>45.9 ± 5.1,2,3</td>
<td>48.2 ± 5.9,1,2</td>
<td>49.9 ± 6.4</td>
<td>52.0 ± 6.7</td>
<td>0.00001</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>20.6 ± 2.2</td>
<td>20.2 ± 2.4,1</td>
<td>19.9 ± 2.5</td>
<td>19.4 ± 2.5</td>
<td>0.0035</td>
<td></td>
</tr>
<tr>
<td>Haemoglobin (g/dl)</td>
<td>11.5 ± 1.1,2</td>
<td>11.5 ± 1.1</td>
<td>11.8 ± 1.0</td>
<td>11.8 ± 1.0</td>
<td>0.0205</td>
<td></td>
</tr>
<tr>
<td>Nulliparas (%)</td>
<td>92.5</td>
<td>92.0</td>
<td>94.1</td>
<td>95.7</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Results are mean ± SD (unless indicated) and comparison with χ² test. Duncan’s test: 1P < 0.05 versus Group 4; 2P < 0.05 versus Group 3; 3P < 0.05 versus Group 2.

BMI = body mass index; NS = not significant.

### Table II. Obstetric risk factors and complications in relation to height quartiles in teenage pregnancies (n = 613)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Height quartiles</th>
<th>Group 1 (25% or ≤25%)</th>
<th>Group 2 (26–50%)</th>
<th>Group 3 (51–75%)</th>
<th>Group 4 (&gt;75%)</th>
<th>P (χ² test)</th>
<th>P (correlation coefficient)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of women</td>
<td>159</td>
<td>161</td>
<td>153</td>
<td>140</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married (%)</td>
<td>36.9</td>
<td>41.1</td>
<td>51.6</td>
<td>42.6</td>
<td>42.6</td>
<td>0.0614</td>
<td>NS</td>
</tr>
<tr>
<td>History of induced abortion (%)</td>
<td>15.8</td>
<td>26.1</td>
<td>12.7</td>
<td>20.6</td>
<td>0.0147</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Smokers (%)</td>
<td>21.9</td>
<td>17.4</td>
<td>13.7</td>
<td>19.5</td>
<td>NS</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Antepartum haemorrhage (%)</td>
<td>1.3</td>
<td>3.1</td>
<td>0</td>
<td>4.3</td>
<td>NS</td>
<td>0.0515</td>
<td>NS</td>
</tr>
<tr>
<td>Prelabour ROM (%)</td>
<td>5.0</td>
<td>4.3</td>
<td>5.9</td>
<td>5.7</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Pre-eclampsia (%)</td>
<td>3.1</td>
<td>2.5</td>
<td>7.2</td>
<td>4.3</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Iron-deficiency anaemia (%)</td>
<td>5.7</td>
<td>4.3</td>
<td>0.7</td>
<td>1.4</td>
<td>NS</td>
<td>0.0342</td>
<td>0.0083</td>
</tr>
<tr>
<td>Sexually transmitted diseases (%)</td>
<td>5.1</td>
<td>8.1</td>
<td>4.6</td>
<td>6.4</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Gestational diabetes (%)</td>
<td>3.1</td>
<td>6.7</td>
<td>4.6</td>
<td>5.7</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Preterm labour (&lt;37 weeks) (%)</td>
<td>15.6</td>
<td>16.0</td>
<td>9.2</td>
<td>7.1</td>
<td>0.0338</td>
<td>0.0064</td>
<td></td>
</tr>
<tr>
<td>Total delivery &lt;37 weeks (%)</td>
<td>17.5</td>
<td>16.8</td>
<td>10.5</td>
<td>8.5</td>
<td>0.0468</td>
<td>0.0076</td>
<td></td>
</tr>
<tr>
<td>Caesarean section (%)</td>
<td>5.6</td>
<td>1.8</td>
<td>2.0</td>
<td>6.4</td>
<td>NS</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

NS = not significant; ROM = rupture of membranes.

### Table III. Infant outcome in relation to height quartiles in teenage pregnancies (n = 613)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Height quartiles</th>
<th>Group 1 (25% or ≤25%)</th>
<th>Group 2 (26–50%)</th>
<th>Group 3 (51–75%)</th>
<th>Group 4 (&gt;75%)</th>
<th>P (one-way ANOVA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of women</td>
<td>159</td>
<td>161</td>
<td>153</td>
<td>140</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gestation (weeks)</td>
<td>38.5 ± 2.0</td>
<td>38.4 ± 2.5</td>
<td>38.9 ± 1.8</td>
<td>38.9 ± 1.9</td>
<td>0.0542</td>
<td></td>
</tr>
<tr>
<td>Birthweight (g)</td>
<td>2920 ± 436,1,2</td>
<td>2992 ± 534,1,2</td>
<td>3097 ± 420</td>
<td>3136 ± 416</td>
<td>0.0001</td>
<td></td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>12.5 ± 1.4</td>
<td>12.7 ± 1.6</td>
<td>12.9 ± 1.5</td>
<td>13.0 ± 1.5</td>
<td>0.0609</td>
<td></td>
</tr>
<tr>
<td>Crown–heel length (cm)</td>
<td>48.5 ± 2.5</td>
<td>48.7 ± 2.4</td>
<td>49.3 ± 3.0</td>
<td>49.1 ± 2.6</td>
<td>0.0437</td>
<td></td>
</tr>
<tr>
<td>Height ratio</td>
<td>0.325 ± 0.016,1,2</td>
<td>0.316 ± 0.016,1,2</td>
<td>0.311 ± 0.016,1</td>
<td>0.300 ± 0.017</td>
<td>0.00001</td>
<td></td>
</tr>
<tr>
<td>Apgar score: 1 min</td>
<td>8.7 ± 1.1</td>
<td>8.8 ± 1.2</td>
<td>8.9 ± 0.8</td>
<td>8.9 ± 1.1</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Apgar score: 5 min</td>
<td>9.8 ± 0.5</td>
<td>9.8 ± 0.6</td>
<td>9.9 ± 0.3</td>
<td>9.9 ± 0.5</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Admission NNU (%)</td>
<td>10.0</td>
<td>8.0</td>
<td>5.9</td>
<td>2.8</td>
<td>0.0846</td>
<td></td>
</tr>
</tbody>
</table>

Results are mean ± SD unless indicated and comparison with χ² test. Duncan’s test: 1P < 0.05 versus Group 4; 2P < 0.05 versus Group 3; 3P < 0.05 versus Group 2.

BMI = body mass index; NNU = neonatal unit; NS = not significant.

Of preterm labour was significantly and inversely correlated with height quartile (r = -0.1670, P = 0.00017).

The relationship between maternal characteristics and gestational age in the whole group was examined by correlation analysis, and gestational age was significantly correlated with maternal age (r = 0.122, P = 0.008), height (r = 0.170, 0.00017).
P = 0.0001) and weight (r = 0.141, P = 0.009). Stepwise multiple regression analysis indicated that only age (t = 2.320, P = 0.0208) and height (t = 2.507, P = 0.0126) were significant maternal parameters that correlated with gestational age, as represented by the following equation:

Gestational age = 29.138 + 0.154 (age) + 0.044 (height)

When the correlation analysis was confined to the uncomplicated pregnancies, gestational age was correlated with maternal age (r = 0.122, P = 0.008), height (r = 0.170, P = 0.0001) and weight (r = 0.141, P = 0.009). Stepwise multiple regression indicated that only maternal height was significantly correlated with gestational age (t = 3.309, P = 0.001), and the following equation was obtained:

Gestational age = 29.695 + 0.059 (height)

Within the group of 55 pregnancies having preterm labour not associated with complications, there was a significant positive correlation between gestational age with birthweight (r = 0.2995, P = 0.026) and crown–heel length (r = 0.3194, P = 0.024), but there was no correlation with the height ratio (r = -0.0750, P = 0.586).

Discussion

In previous studies, while preterm birth was attributed to the ‘inherent risk’ in (Fraser et al., 1995), and the biological immaturity of (Olausson et al., 1999), teenage women, what these factors actually referred to was unclear, and the role played by these factors and the conflicting observations on perinatal outcome in teenage pregnancies (Lao and Ho, 1997; Olausson et al., 1999) could not be resolved. An important consideration, which should not be overlooked, is the period of birth in the study cohorts. The conclusions drawn from studies that have spanned several decades in the past would not be applicable nowadays because of the improvement in obstetric management and neonatal care, not to mention the concomitant background socio-economic developments in places where these studies have originated. Indeed, more recent data (Olausson et al., 1999) have clearly indicated that the rate of late fetal and neonatal deaths in nulliparas aged 13–24 years fell from 6.1 per 1000 and 6.5 per 1000 respectively in the 1973–1976 cohort to 3.8 per 1000 and 3.4 per 1000 respectively in the 1985–1989 cohort. Thus, an appreciation of the risk and outcome of teenage pregnancies should be based on data acquired as recently as possible.

In this study, we have reviewed the teenage pregnancies that were delivered in our hospital over a 4-year period (1994–1997), and which were managed by following the same protocol. Our observations are therefore current rather than historical. During these 4 years, our perinatal mortality rate had fallen from 9.9 per 1000 to 5.3 per 1000 and the overall incidence of preterm delivery in non-teenage mothers was 7.8% (data from our departmental statistics). Among the teenage pregnancies, the overall incidence of preterm delivery and labour were 13.5% and 12.2% respectively. The majority of these preterm deliveries occurred at between 33–36 weeks gestation, and the incidence was highest in the two lower quartiles, even though there was no difference in the incidence of risk factors such as a history of previous pregnancy termination, maternal smoking, nulliparity or major complications. While iron-deficiency anaemia was more common in the lower quartiles, the relatively low incidence was unlikely to render it a major determinant of preterm birth. Similarly, although the mean haemoglobin level was lower in the lower quartiles, the values were well within the normal range. We suspected that the lower haemoglobin and the iron deficiency in teenagers in the lower quartiles were the reflection of a mild degree of nutritional deficiency at a time of increased nutritional demand due to the rapid physical growth. When the cases with complications were excluded, the relationship between preterm labour and maternal height became even more obvious, and maternal height was inversely correlated with the rate of preterm labour. In addition, multiple regression analysis confirmed that maternal height was the only significant determinant for both the uncomplicated cases as well as the entire group. It is therefore clear that maternal height at the time of pregnancy is a major determinant of gestational
duration, and hence short stature would be associated with increased risk of preterm labour.

Nevertheless, the impact of maternal height on gestation duration was relatively small, as shown by the regression equation. This might be related to the fact that longitudinal growth can occur during pregnancy in the teenager, and that the increment is greater in the nulliparas compared with the multiparas (Scholl et al., 1988). The factor linking height with duration of gestation is likely to be the dimensions of the bony pelvis in teenagers. Teenagers are less mature physically, and the teenage pelvis is smaller and its growth lags behind statural growth (Moerman, 1982). Thus, a teenager probably has a smaller pelvis than an adult in the second or third decade of life, albeit with the same height. As the incidence of Caesarean section in the lowest quartile was only 5.6%, the fetus would necessarily have to be smaller in order to have a successful passage through the bony pelvis. As shown in our cases, while the infant birthweight and crown–heel length increased with the higher quartiles, the height ratio changed in the opposite direction. Moreover, while gestational age was positively correlated with infant birthweight and crown–heel length as expected, there was no correlation with the height ratio. These observations suggested that, in the lower quartiles, the fetal length had reached a maximum, relative to maternal height, that is feasible for vaginal delivery at the onset of labour. This would help to explain why our cases of ‘uncomplicated’ preterm labour all occurred between 33 and 36 weeks of gestation.

There is evidence in the literature which indicates that an optimal ratio exists between maternal and fetal size, irrespective of maternal age. In one study (Garn and Petzold, 1983), teenage mothers who had small stature and weight gave birth to smaller-sized infants in proportion to their smaller size, with the outcome no worse than that from mothers in the third decade of life and with comparable size. Furthermore, there was increasing birthweight and placental weight with increasing maternal age at pregnancy, which was correlated with increasing height. These findings were supported by later observations (Witter and Luke, 1991) in which shorter mothers were reported to tend to give birth to symmetrically smaller infants. A further study (Sukanich et al., 1986) reported that primigravidae aged <16 years and who had not achieved mature height and weight, had shorter mean gestation, even though there was no relationship between physical growth maturation and adverse outcome, such as pregnancy-induced hypertension, low-birthweight infants, or preterm delivery. Furthermore, the young primigravidae could nourish themselves and their fetuses adequately with no increased complications among the preterm infants born to these mothers. The birthweight that was associated with a particular maternal pre-pregnant weight was the same for teenagers as for mothers in the third decade. These observations, together with the finding of the association between low pre-pregnant BMI and preterm labour at 33–36 weeks (Hickey et al., 1997), all pointed to the importance of maternal physique as a determinant of fetal size, which in turn could be controlled by the length of gestation at delivery.

The findings of this study indicated that the risk of preterm delivery and labour was higher in teenage pregnancies, and the incidence was inversely correlated with maternal height. This suggested that the inherent risk of preterm delivery in teenagers (Fraser et al., 1995) was maternal short stature, which in turn could have been a reflection of immature physical development at the time of pregnancy. We would postulate that Nature, in the attempt to achieve a successful vaginal delivery in a teenage woman, would initiate labour when the fetus had reached a maximal size relative to that of the mother, and that this relationship would be dependent more on the physical maturity and development of the mother than on the actual gestational age. Such a mechanism could also help to explain the relationship between maternal height and the duration of pregnancy (Mongelli and Opatola, 1995), though further studies with larger sample size will be necessary to determine the impact of maternal height on perinatal outcome in teenage, as well as non-teenage, pregnancies.

References


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