

## Teenage Pregnancy and Perinatal Outcomes: Experience from Rural South Africa

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### Abstract

**Context:** Teenage pregnancy is known as a risk factor for preterm birth, low birth weight and perinatal deaths, thus considered public health problem. In South Africa, most teenage pregnancy is found within the context of unstable relationship and unplanned or unwanted pregnancies. A high rate of teenage pregnancy is also an indicator of problems with the sexual and reproductive health of a country's youth.

**Objectives:** To estimate the extent of and measure adverse perinatal outcome of teenage pregnancy and compare.

**Study-Design, Setting and Subjects:** A retrospective comparative study was conducted targeting pregnant women delivered at Empangeni hospital from April to December 2004. All pregnant women who were less than 19 years (teenage) were chosen as cases and those who were 19 years or more were selected as controls. Data were collected from the labour ward delivery registry.

**Main Outcome Measures:** Prevalence of teenage pregnancy, Pre-term delivery, low-birth-weight and still-birth rates.

**Results:** There were 7836 deliveries of which 1236 (16%) were teenage mothers. The pre-term delivery rate of 12% and low-birth-weight delivery rate of 14% were similar for teenage and older mothers respectively. Cesarean delivery rate was significantly lower ( $p < 0.05$ ) in teenagers (20%) compared to older women (26%). Macerated stillbirth rate was significantly lower (1.1%) for teenage compared to older women of 2.1% ( $p < 0.05$ ).

**Conclusion:** Although there was a higher rate of teenage pregnancy, it did not appear that it was associated with extra perinatal outcome.

**Keywords:** Teenage Pregnancy, Preterm Delivery Rate, Low-Birth-Weight Delivery Rate, Stillbirth Rate.

### Introduction:

Teenage pregnancy is regarded as an important public health problem as it often occurs in the context of poor social support and maternal wellbeing and with an association of adverse pregnancy outcome, such as preterm births, low-birth-deliveries, fetal growth retardation and perinatal mortality.<sup>1, 2</sup> In addition, there is increased risk of assisted delivery and cesarean section.<sup>3</sup> However, other studies have suggested that these effects are due to other confounders.<sup>4</sup> A high rate of teenage pregnancy also indicates problems with the sexual and reproductive health of a country's youth. This has important implications for

efforts to reduce other health issues such as the spread of sexually transmitted diseases

(STDs) and HIV. First teenage pregnancies have also reported greater frequency of adverse perinatal outcomes than the second or subsequent pregnancy.<sup>2, 5</sup> Studies from the United States of America and Netherland have found that younger teenage mothers were more likely to deliver preterm babies

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compared with women in their twenties.<sup>6, 7</sup> These studies have focused around the role of infection and severe psychosocial stress factors such as coexisting social isolation, homelessness and violence, which are more common in teenage mothers around the world.<sup>8, 9</sup> It is also evidenced that preterm deliveries are common in teenagers who experience social trauma such as family violence.<sup>10</sup>

In South Africa (SA), teenage pregnancies are seen to occur within the context of unstable relationship and are found unplanned or unwanted. Studies have reported that unplanned pregnancy predisposes women to unsafe abortion and even premature and preventable deaths.<sup>11</sup> Maternal and child health programme in SA is located in general development policies, which are focused on meeting the basic needs of rural and urban communities, maximizing human resources potential, enlarging the economy and spreading its benefits and democratizing society and its institutions. To comply with these principles, free healthcare services for pregnant mothers and children under the age of 6 years in public health facilities are introduced since 1994. Recently a child support grant is also introduced for mothers from the government of SA. Teenage mothers enjoy a similar degree of care as their older peers in public health facilities. Thus, the objectives of the study were to; estimate the prevalence of teenage pregnancy and compare the obstetric and perinatal outcome of teenage and non-teenage pregnancies delivered at Empangeni hospital.

### Methods and Materials

#### Setting and population

Empangeni sub-district of Uthungulu health district (one of the 11 districts) in the province of KwaZulu-Natal is the residence of over 450 000 people. According to census 2001, more than 93% of its people are rural, black and speak local language (isiZulu). It is

situated at the eastern and northern part of the province and on the coastal line of the Indian Ocean and approximately 170 kilometers north of the commercial capital and port city Durban. There are two hospitals and fourteen primary health care (PHC) clinics run by public sector cover mainly rural and poorer people of the district. Empangeni hospital is dedicated to maternal and child healthcare services and referral center for all PHC facilities in the sub-district. There are two private hospitals run mainly by both private specialists and there are over 40 general practitioners' services based mainly at urban areas. The specialists and medical practitioners of Empangeni hospital visit all clinics to support and train staff and manage complicated cases (of maternity) on a weekly basis.

Antenatal care is provided at all primary healthcare clinics (14 in the area) through nursing staff preferably with midwives, covers 90% of antenatal population and at Empangeni hospital (covers 10% of antenatal population). Most (95%) of the district deliveries (at public health institutions) are conducted at Empangeni hospital and the rest at 14 PHC clinics as the clinics are operated for day services. Antenatal care at all public health facilities in South Africa (including Uthungulu) is provided based on the national protocol and guidelines.<sup>12</sup> Accordingly, at the first antenatal visit, full and relevant histories are taken. Physical examinations of present pregnancy consisting of general and systematic examinations are conducted. Pregnancy examinations include inspection and palpation of the pregnant uterus, with measurement of the symphysis-fundal height (SFH) in cm. Auscultation of the fetal heart are performed from 26 weeks of gestation.

The first estimation of gestational age, with the expected date of delivery, is used for the remainder of the pregnancy. Last menstrual

period is used if the woman is sure of her dates, and where palpation of the uterus and SFH measurement are compatible with the given dates. SFH measurement is used if the dates from the last menstrual period are unknown or wrong. The measurement of SFH is plotted onto the 50th centile line on the SFH graph, allowing the corresponding gestational age to be read from the graph.

Blood samples are taken for essential screening for syphilis serology by rapid test, haemoglobin (Hb.) level using portable haemoglobinometer (all pregnant women have an Hb. measurement done at 1st antenatal visit and again at 28 and 36 weeks) and HIV serology (after pretest counseling) at all PHCs clinics and Empangeni hospital.

Rhesus (D) blood grouping is done at all health facilities using a rapid card test, urine dipstick for protein and glucose are done in every visit. Voluntary counselling and testing for HIV were offered to all pregnant mothers for possible inclusion in the prevention of mother-to-child transmission of HIV programme. Every mother attending a public healthcare facility receives stocks of ferrous sulphate (200 mg daily) and folic acid (150 mg daily) for supplementation until the next appointment. Tetanus toxoid immunization, to prevent neonatal tetanus (a total of 3 doses): 0.5 ml Intra-Muscular (IM) at the booking visit is followed by second dose 4 weeks later and the third dose is given after 6 months of the second dose. At the first visit, health education on: (i) danger signs and symptoms (ii) self-care in pregnancy (iii) delivery plan and (iv) newborn and infant care are given to all pregnant women.

Based on the findings of the above examinations and investigations, a final assessment on risk status and a plan for further antenatal care, plan for management of any problems and delivery are made. Once risk factors and or conditions are identified at any visit, the pregnant mother is referred to Empangeni hospital antenatal clinic.

#### Study design and data collection

A retrospective case control study was conducted targeting women delivered at Empangeni hospital from April to December 2004. Women who were less than 19 years (teenage) were cases and all others (older women) were selected as controls. Data were collected from labour ward delivery register. The register was the only official record of deliveries and recorded demographic (name, age, address of mothers), pregnancy (gestational age, antenatal care information and complications of pregnancy e.g. anaemia (haemoglobin < 10gm), obstetric, labour and perinatal information. The register was developed and distributed by the national department of health and is been used at Empangeni hospital. The obstetric information on the register were; presentation of foetus during labour, plurality, time of delivery (recorded in hours and minute), mode of delivery (normal vaginal, vaginal delivery using operative procedure such as vacuum or forceps and caesarean section), complications of delivery (e.g. perineal and or cervical tear). Perinatal information included were birth weight, birth outcome of babies (live birth, still birth, apgar score in 1 and 5 minutes), post partum bleeding etc. These informations were recorded by the attending midwives. Haemoglobin estimation was either done at 36 weeks routinely or at labour ward during admission using portable haemoglobinometer. All midwives working at labour ward are oriented and received in-service training on filling labour ward register and compilation of monthly summary presentation at weekly perinatal mortality meeting.

#### Definition of terms

"Preterm delivery" was considered when mothers deliver a new born baby at 28 weeks up to 36 weeks of gestational age. The "term delivery" was considered when babies were

born at 37 to 41 weeks of gestation. Any delivery that occurred at 42 completed weeks or more gestation were considered "post term delivery".

"Still-birth" referred to birth of a dead fetus weighting more than 1000gm or after 28 weeks of gestational age. It was conventionally divided into two categories, ante-partum still births, when a fetus died before the onset of labor and often referred to "macerated still-birth" (MSB), and intra-partum still births, when fetal death occurred during labour and referred to "fresh still-birth" (FSB).

Prevalence of anaemia was considered as the percentage of women who had haemoglobin level < 10 gm/dL in accordance with the national definition of anaemia in pregnancy.<sup>13</sup>

#### Data analysis

The predetermined data to measure specific objectives were entered into Microsoft excel 2003 spreadsheet program and imported to SPSS 11.5 for window version for analysis. Frequency tables, cross tabulations with Pearson chi-square tests were performed to measure the level of significance (5%) for association among variables. Standard deviation (Sd) and 95% confidence interval (CI) were used for different rates (where applicable).

Prior permission was obtained from the hospital management for utilizing hospital data (delivery data from maternity register) to conduct the study. No identification of patient or staff was required to present the results.

#### Results

During the study period, there were 7836 deliveries of which 1236 (16%) were teenage pregnancy. Among the teenagers 93.5% were nulliparous compared to 37% in the non-teenagers ( $p < 0.05$ ). Multiparous teenagers were only 6.5% compare to 63% in non-teenagers. The mean age of the

teenagers was 17.08 years (Sd = 1.014 and range 13 - 18 years) and 25.50 years (Sd = 5.289 and range 19 - 46 years) for the controls and the difference was statistically significant ( $p < 0.05$ ). Virtually all in both groups had antenatal care during pregnancy and on average six antenatal visits (Table I). The gestational age (pre-term, term and post-term) at the time of delivery between the groups were not different. There was no significant difference in the prevalence of anaemia at the time of delivery for teenage (12.4%) and older women (13.7%).

Foetal presentations (e.g. vertex, breech), multiple pregnancy rates, delivery complications (e.g. third degree perineal and cervical tear) at the time of delivery were similar in both groups. A higher rate of episiotomy (44%) was given to teenage mother compared to older mothers (20.4%). Caesarean delivery rate was the second highest mode of delivery in both groups but significantly higher ( $p < 0.05$ ) in older women (26%) compared to teenage mothers (20%). Assisted delivery (vacuum delivery) rate was higher in teenage (4.5%) mothers compared to older mothers (2.7%). Although the mean birth weight for the groups were significantly different but low-birth-weight delivery rates were similar 14.3% and 13.7% respectively for teenage and older mothers ( $p > 0.05$ ). There was no difference in FSB rates between the groups but significantly a lower rate of MSB was observed in teenage pregnancy (1.1%) compared to older women of 2.1% ( $p < 0.05$ ). Similarly, the apgar score of babies at one and five minutes born to teenage and older mothers were similar.

Applying Chi-square test of association we found that multiple pregnancy ( $p = 0.000$ ), breech presentation ( $p = 0.000$ ), and still births ( $p = 0.000$ ) were statistically associated with the low-birth-weight of the infants. FSB and MSB were significantly associated with gravida of the pregnant women ( $p = 0.000$ ), breech presentation at delivery ( $p = 0.000$ ), forceps delivery ( $p$

Table 1: Information on pregnancy, labour and delivery of teenage and older mothers (7836 mothers) who delivered at Empangeni hospital during April to December 2004.

Variables	Teenagers	Older women	p value
Mean Age	17.08 (Sd = 1.014)	25.50 (Sd = 5.289)	p < 0.05
Antenatal booking (percent)	98	97	NS
Mean antenatal visits (Number)	5.96	5.57	NS
Prevalence of anaemia (rate)	12.4	13.7	NS
Gestational age at delivery			
Pre-term delivery	12.1	12.2	NS
Term delivery	85.7	86	NS
Post-Term delivery	1.6	1.8	NS
Gravida (percent)			
1	93.2	37	p < 0.05
2-5	6.5	63	p < 0.05
Mode of delivery (percent)			
Normal (vaginal)	68.4	68.2	NS
Vacuum	4.4	2.7	p < 0.05
Forceps	0.7	0.3	NS
Cesarean	20	25.8	p < 0.05
Episiotomy	43.6	20.4	p < 0.05
Foetal presentation at labour (percent)			
Vertex	95.8	94.6	NS
Breech	2.8	3.4	NS
Other	0.2	0.4	NS
Multiple pregnancy rate	1.5	2.3	NS
Third degree Perineal tear	0.1	0.3	NS
Cervical tear	0	0	NS

=0.002) and low-birth-weight (p =0.000) deliveries.

#### Discussion:

The rate of teenage pregnancy (16%) in this community is considered high a similar rate was in KZN observed in a recent study from another district.<sup>13</sup> This could have been due to change of adolescents' sexual behaviour and activities. It has been observed that girls of younger ages are involved in sexual activities in earlier ages. Studies have shown that because of having frequent sex without reliable contraceptive protection, often victim of forced sexual initiation contributed

higher rate of teenage pregnancy.<sup>14</sup> Conditions and behaviors producing high levels of teenage pregnancy are also likely to bear upon the risk of acquiring HIV. The need to reduce the risk of teenage pregnancy has thus warrants an urgent strategy to reduce in future because of the concomitant risk of contracting HIV and should be considered in South Africa (the epi-centre for HIV pandemic).

There was no significant difference on prevalence of anaemia in both groups. Iron deficiency anaemia is the most prevalent nutritional deficiency problems affecting pregnant women.<sup>15</sup> Iron deficiencies develop

during pregnancy because of the increased iron requirements to supply the expanding blood volume of the mother and the rapidly growing fetus and placenta. Every mother attends public health care facility receives stocks of ferrous sulphate (200 mg daily) and folic acid (150 mg daily) as supplementation during antenatal period from first antenatal visit as part of a standard management.<sup>12</sup> Hemodilution is an important physiologic adaptation to normal pregnancy, and women who do not hemodilute have higher incidence of preeclampsia but the prevalence of this condition is found lower in other studies.<sup>17,18</sup> It is therefore, not unlikely that teenage mothers could adapt and fulfill

have been expected.

The caesarean delivery rate was significantly lower among teenagers, a finding in contrast to other studies.<sup>3, 4, 19</sup> This significant lower rate was unexpected. One possible explanation of lower rate of caesarean delivery could be the reluctance of obstetricians to perform elective caesarean delivery on teenagers, especially those who were unmarried or without a stable relationship to avoid a scar that would remind them forever of this pregnancy, but also to avoid jeopardizing any future reproductive performance. On the other hand, higher rate among older women could

Table 2: Perinatal outcome in teenage and older mothers

Variables	Teenagers	Older mothers	p value
Mean birth weight	2918 gm	2998 gm	p < 0.05
Low-birth-weight rate	14.3	13.7	NS
Birth outcomes (percent)			
Live birth	97.5	96.7	NS
FSB	1.1	1.2	NS
MSB	1.1	2.1	p < 0.05
Apgar Score			
In 1 min	7.97	8.03	NS
In 5 min	9.48	9.44	NS

the requirements of iron deficiency during pregnancy. This study demonstrated that the obstetric risks of pregnancy in teenage women are generally low except assisted delivery (use of vacuum and episiotomy). Vacuum delivery and use of episiotomy were higher in teenage mothers could be due to poor maternal effort to push out the baby by the mother during delivery and it is logical that they would be at their different stages of physical strength and immunity and lack of previous experience of delivery. On the other hand, assistance to teenage mothers during delivery by episiotomy is recommended as a routine practice in SA.<sup>12</sup> Therefore, a higher rate of episiotomy would

be due to their previous caesarean deliveries from previous pregnancies thus higher rate is expected. Decision of caesarean delivery was undertaken on the basis of obstetric reasons only. The standard protocol in Empangeni hospital is that pregnant women with two or more previous caesarean delivery would have elective caesarean delivery done at the subsequent pregnancy or pregnancies at term (between 37 and 38 weeks of gestation). Thus teenage pregnancy does not seem to have higher rate of caesarean delivery in this population. The main reasons for caesarean delivery (e.g. cephalo-pelvic disproportion, foetal distress etc.) among the groups are not known from

this study. However, the conventional belief is that teenage mothers are less mature physically and the size of the bony pelvis in the teenage mothers might be significantly smaller than that in the older mothers. One would therefore expect that given the same fetal size, teenage mothers should have a higher instrumental and caesarean delivery rate, but this is disproved by our findings. Since it has been shown that longitudinal growth can occur during pregnancy in the teenager, the increment being greater in the nulliparas compared with the multiparas, it is also known and possible that pregnancy enhances the growth of the bony pelvis in adolescents.<sup>20</sup> We also found that incidence of preterm delivery and low birth weight delivery rates were similar to both groups but at a higher rate (12% and 14% respectively). We have demonstrated that the obstetric outcome of teenage pregnancies in this hospital or population was similar to older mothers.

This study was limited to those women who delivered at Empangeni hospital. In KZN, it is estimated that over 95% of women attend to antenatal care facilities.<sup>3, 4</sup> It is however not known the exact proportion of pregnant women deliver at Empangeni hospital. But it is estimated that over 95% of all health facilities deliveries in the district are conducted in Empangeni hospital as all other PHC facilities are closed after hours and they provide antenatal care during day only. The assessment of pregnancy and obstetric conditions were limited because of limited data available in the registry (e.g. eclampsia, pre-eclampsia, ante-partum haemorrhage etc.) were not available in the register). However, overall perinatal outcomes (e. g. low-birth-weight delivery, still births) were assessed in this study. A higher rate of antenatal attendances and higher number of average antenatal visits are observed for both groups (teenage and older mothers). In South Africa, after political transition in

1994, access to healthcare particularly maternal and child healthcare became free of user's fee at the public health facilities in order to remove the barrier and improve access to health services. Therefore, one can assume that pregnant teenagers attended and received the same standard of care but without any prohibiting factors in their attempt to seek care and support. Higher attendances and care thus might have improved overall teenage pregnancy outcome in this population.

Since there was no difference in the extent of prenatal, delivery and post-natal delivery care, comparison between teenage and older women could provide a reasonable clean picture of whether teenage mothers have different obstetric outcome.

A previous study showed that preterm delivery was more than twice as likely in women with iron deficiency anaemia.<sup>21</sup> Iron intake early in pregnancy and the incidence of preterm labour were not increased with anaemia from other causes. Iron has an important metabolic effect on function of coenzymes. The association between anaemia and preterm labour might be caused by iron deficiency rather than anaemia per se.

Unlike other studies, we found similar low birth weight deliveries in teenage and older mothers.<sup>2, 19, 22</sup> Similarly, we found that teenage mothers were at no greater risk of still birth than women of older age.

A standard package of services and care for all pregnant women formulated and implemented with dedicated and trained midwives with the aid of necessary provisions might have contributed better service delivery and similar level of outcome. This would have made possible a better pregnancy, obstetric and perinatal outcome for teenage mothers in this population. Our data showed that pregnancy in women less than 19 years old was generally associated with small changes in obstetric risk. It is

important to emphasize that because many confounding variables were not included in this study, however the age related obstetric and perinatal risks for teenage women are low and we believe that pregnancy is associated with considerable socioeconomic problems. It might lead to social exclusion and can reduce educational, career, and economic prospects. The consequences of teenage pregnancy can be detrimental to the health of women and children. Society thus requires paying the cost of teenage pregnancy in welfare support for young mothers caught in a poverty trap.

#### Conclusion

Given appropriate prenatal care, the

pregnancy outcome in teenage mothers was comparable to that of older women. The result of this study highlighted that teenage pregnancy does not carry any extra risk of obstetric and pregnancy outcome such as low birth weight babies, preterm deliveries and still births but socio-economic problems may still exist. Thus strategies are urgently needed to delay conception and socio-economic development.

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