Original Article

Comparision of obstetric outcome among teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan

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Abstract

Objective: To compare the obstetric outcome of teenage pregnancies with that of non teenage pregnancies.

Methods: A prospective case-control study was conducted in three tertiary care hospitals of Sindh, Pakistan from September 2008 to November 2008. The data regarding obstetric outcome of all teenagers (13-19 years) delivering in the three hospitals was compared with that of selected non teenage women (20 to 35 years) taken as controls. Chi-square and students' t-test were applied with 0.05 as level of significance.

Results: Teenage mothers were more likely to suffer from severe anaemia (8% versus 4.3%; p = 0.03) and chorioamnionitis (2.8% vs 0.8%, p = 0.01) and their infants were more likely to suffer from post maturity (4.6% vs 1.8%, P = 0.02) and meconium aspiration syndrome (6.5% vs 2.4%, p < 0.01) compared to non-teenage mothers. On the other hand they were less likely to be overweight than the non-teenagers. Teenagers had instrumental deliveries more often than non-teenagers (7.1% vs 2.2%, p < 0.01). The risk of preterm delivery, low birth weight infant, respiratory distress syndrome, foetal and perinatal death was not significantly different in the two groups.

Conclusion: Teenage mothers are at a higher risk of developing severe anaemia and chorioamnionitis. They are more likely to have an instrumental delivery than non-teenagers. Post maturity and meconium aspiration syndrome are the neonatal complications seen in infants born to teenage mothers.

Keywords: Teenage pregnancy, Non-teenage mothers, Obstetric outcome, Sindh (JPMA 61:963; 2011).

Introduction

Child marriages are common traditional practices in Pakistan even though the law prohibits marriage below 16 years for women and 18 years for men.[1] Generally these young girls are expected to become pregnant soon after marriage in order to prove their fertility. According to the latest Pakistan Demographic and Health Survey (PDHS), 40% of women are married by the age of 18 years. However, the proportion of teenagers who have begun childbearing has gone down from about 16% in 1990-91 to 9% in 2007.[2]

The evidence which is available about the outcome of teenage pregnancy is conflicting to say the least. Teenage pregnancies have been reported to be associated with an adverse obstetric outcome.[2,3] There is a strong correlation between the age of the mother and maternal mortality and morbidity. Girls aged 10-14 years are five times more likely to die in pregnancy or childbirth than women aged 20-24 years. Girls aged 15-19 years are twice as likely to die.[4] Many studies have reported an increased risk of maternal complications like pregnancy-induced hypertension, pre-eclampsia, eclampsia, prolonged labour and cephalo-pelvic disproportion in pregnant teenagers.[5,6] In addition, adverse pregnancy outcomes like preterm delivery, low birth weight infant, respiratory distress syndrome, stillbirths and perinatal deaths have all been associated with adolescent mothers.[5-7]

However, there are studies which have attributed the poor pregnancy outcome of teenage pregnancy to low socioeconomic status, illiteracy, lack of antenatal care, social support and contraception rather than to maternal

age.[8,9] Married adolescents usually lack awareness about the basic reproductive health issues as many of them are forced to leave school at an early age. They may be unable to obtain healthcare because of their powerlessness, distance, financial problem or the need for permission from a spouse or in-laws. These barriers can thus aggravate the risks of maternal mortality and morbidity for pregnant adolescents.[10]

Some studies have actually shown a good outcome of teenage pregnancies (apart from a higher incidence of preterm labour) in developed countries where high quality maternity care is available.[11,12]

In Pakistan, due to paucity of research in this area, there are various gaps in the knowledge regarding the outcome of teenage pregnancies. Therefore, we conducted this case-control study to compare the maternal and perinatal outcome of teenage pregnancies with that of non-teenage pregnancies in three tertiary care hospitals in the province of Sindh, Pakistan.

Patients and Methods

This was a prospective case-control study conducted at Jinnah Postgraduate Medical Centre (JPMC), Karachi, Civil Hospital Karachi (CHK) and Peoples Medical College Hospital, Nawabshah (PMCH) from 1st September 2008 to 30th November 2008. Ethical approval for the study was obtained from the Ethical Review Board of Dow University of Health Sciences, Karachi. All teenagers aged 13-19 years with a singleton pregnancy who delivered during this period were taken as the cases. Controls were taken as any woman aged between 20 and 35 years with a singleton pregnancy, who delivered before or after the study case on the same day and satisfied the criteria for controls. Women having a history of any medical illness prior to their current pregnancy e.g. hypertension, diabetes mellitus, cardiac, renal, endocrine or autoimmune disease were excluded from the study. Maternal complications compared between the two groups were anaemia, hypertensive disorders of pregnancy, gestational diabetes, poly/oligohydramnios, antepartum/postpartum haemorrhage, ruptured uterus, traumatic lesions, and chorioamnionitis. Foetal and neonatal morbidities compared between the two groups were preterm/post-term, low birth weight, congenital malformations, meconium aspiration syndrome, respiratory distress syndrome, admission in neonatal nursery and perinatal death. Women who met the inclusion criteria were counseled about the study and a verbal consent was taken. All women were interviewed for demographic information like ethnicity, educational status and antenatal care and their weight and height was taken. Clinical information about maternal and foetal outcome of pregnancy was retrieved from the medical charts. The data regarding the demographic characteristics of the mother and clinical information about foetal and maternal outcomes were recorded on a structured Questionnaire.

A total of 1065 women (with a ratio of teen aged and non-teen aged women as 1:5) achieved 80 percent power with associated factors when anaemia, low birth weight, malnourished status, obesity, low birth babies, preterm babies, foetal distress, meconium aspiration, illiteracy, antenatal care etc. were taken in the range between 10% to 80%, anticipated odds ratio for teen aged women of 2 or more and 5% level of significance. All the completed questionnaires were pooled together and the collected data was entered into Epidata (version 3.1) by two independent operators. The data was analyzed using statistical software SPSS (version 16.0). Frequencies of demographic variables were generated. Various foetal and maternal outcomes as outlined in the questionnaire were compared between the two groups. Statistical significance was calculated by a chi-square test for categorical variables and Student's 't' test for continuous variables. A p value less than 0.05 was considered significant.

Results

The total number of deliveries in the three hospitals during the study period was 3075 out of which 179 were teenage pregnancies giving an overall frequency of 5.82%. The total number of filled questionnaires from the three hospitals was 1092 (JPMC: 444, CHK: 373, PMCH: 275) which comprised of 176 cases of teenage pregnancies and 916 cases of non-teenage pregnancies which were taken as controls.

Table-1 shows the demographic characteristics of teenage and non-teenage mothers. All the women recruited in this study were married. The mean ages of teenage and non-teenage mothers were 18.4±0.8 and 26.5±4.3 years, respectively. Majority (n=94; 52.5%) of the teenage mothers were 19 years old followed by 18 years (n=62; 34.6%) and 17 years (n=17; 9.7%). Only 6 (3.4%) were 16 years old and there was none below that age.

Only fifty percent of the pregnant teenagers were primigravidas. More than 32% were having their second baby

Table-1: Distribution of cases and controls included from three hospitals.

	JPMC n (%)	CHK n (%)	PMCH n (%)	Total n (%)
Cases	124 (70.5)	40 (22.7)	12 (6.8)	176 (100)
Controls	320 (34.9)	333 (36.4)	263 (28.7)	916 (100)
Total	444 (40.7)	373 (34.2)	275 (25.2)	1092 (100)

JPMC: Jinnah Postgraduate Medical Centre, CHK: Civil Hospital, Karachi, PMCH: Peoples Medical College Hospital.

Table-2: Comparison of maternal complications between teenage and non-teenage mothers.

Variable	Cases n (%)	Controls n (%)	p value
Anaemia (Hb < 11 gm/dl)	102 (58.0)	512 (55.9)	NS
Severe anaemia (Hb < 7gm/dl)	14 (8.0)	39 (4.3)	0.03
Preterm premature rupture of membranes (PPROM)	2 (1.1)	8 (0.9)	NS
Hypertensive disorders of pregnancy	18 (10.2)	64 (7.0)	NS
Gestational diabetes	1 (0.6)	1 (0.1)	NS
Oligohydramnios	1 (0.6)	7 (0.8)	NS
Polyhydramnios	0 (0.0)	4 (0.4)	NS
Antepartum haemorrhage	1 (0.6)	10 (1.1)	NS
Postpartum haemorrhage	1 (0.6)	6 (0.7)	NS
Chorioamnionitis	5 (2.8)	7 (0.8)	0.01
Maternal mortality	0	1 (0.1)	NS
Hospital stay in days, (mean±SD)	1.6±2.2	1.9±2.3	NS

Hb: Haemoglobin, SD: Standard deviation, NS: Non-significant.

Table-3: Comparison of foetal and neonatal complications between teenage and non-teenage mothers.

Variable	Cases n (%)	Controls n (%)	p value
Low birth weight (< 2500 gm)	32 (20.5)	140 (17.7)	NS
Preterm	12 (7.7)	47 (5.9)	NS
Post-term	7 (4.6)	14 (1.8)	0.02
Foetal distress	14 (9.3)	55 (7)	NS
Meconium aspiration syndrome	10 (6.5)	19 (2.4)	< 0.01
Respiratory distress syndrome	2 (1.3)	18 (2.3)	NS
Admission to neonatal nursery	11 (7.1)	57 (7.3)	NS
Congenital anomalies	1 (0.6)	18 (2.3)	NS
Stillbirth	10 (6.5)	66 (8.3)	NS
Neonatal death in hospital	1 (0.7)	11 (1.4)	NS

NS: Non-significant.

and around 17% were having their third or more babies. The mean BMI was significantly lower for teenage mothers compared to non-teenage mothers (21.9 versus 24.8, p = <0.001). Literacy levels and antenatal care uptake were better for teenagers than for adults although the difference was not statistically significant.

Maternal complications of both groups are compared in Table-2. Majority of the mothers were anaemic in both groups, however severe anaemia was almost twice as common among the pregnant teenagers as in non-teenagers. Chorioamnionitis was also found to be three times more frequent in teenage mothers. Other complications of pregnancy were not significantly different between the two groups. The rate of normal vaginal delivery was similar in both groups but that of caesarean section was lower for teenagers. However this difference was not statistically significant. On the other hand, the rate of instrumental delivery was significantly higher among the teenage group.

Table-3 shows the comparison in foetal and neonatal outcome between both groups. The frequency of post-term babies was found to be more than twice as high in teenage pregnancies compared to non-teenage pregnancies ($p<0.05$). The frequency of meconium aspiration syndrome was also observed to be approximately three times higher in cases compared to controls. We did not find significant difference in the frequency of other neonatal complications.

Discussion

This is a preliminary study which has focused on determination of the maternal and foetal risks associated with pregnancy in teenage mothers. To the best of our knowledge, this is the first multi-centre study in Pakistan conducted in three tertiary care hospitals. The frequency of teenage mothers in our study was found to be 5.8% which is much less compared to 11% reported in a study from Karachi. However, the latest Pakistan Denographic Health Survey (PDHS) 2007[2] has reported the frequency of teenage pregnancy as 7% for Pakistan.[1]

All mothers in both groups were married and hence there was no problem of lack of social support for pregnant teenagers as reported by some other studies.[8,10,13,14] We studied the ethnic background of both groups and teenage pregnancy was found to be most frequent among the Pathans (28/109; 25.7%) followed by Punjabis (22/101; 21.8%). Other ethnicities included; Urdu-speaking women (72/444; 16.2%) and Sindhi-speaking women (26/296; 8.8%). Although illiteracy and lack of antenatal care were rampant in both the study groups, teenagers fared slightly better though statistically insignificant. This finding is in contrast to previous reports which have shown poor levels of literacy and antenatal care among teenage mothers.[6,10,14,15] The fact that 17% of the pregnant teenagers were already in their third or more pregnancy highlights the lack of awareness about contraception among our adolescents.

Majority of the women in both groups were anaemic (Hb < 11gm/dL) which may reflect the general state of nutritional deficiency in our women. However, the frequency of severe anaemia (Hb < 7 gm/dL) was found to be significantly higher in teenage mothers. This may be explained by their physical immaturity, as these young mothers are still growing and may compete with the growing foetus for nutrients.[7] This finding has also been reported by several other studies.[6,12,16]

In addition to severe anaemia, teenage mothers were also found to be having a higher risk of developing chorioamnionitis. Similar finding has already been reported in a previous study.[11] We do not have a clear cut explanation for this finding. However, one plausible mechanism for this increased risk of chorioamnionitis could be the anatomical

and physiological changes of puberty that are yet not complete. Thus the relative alkalinity of prepubertal vagina could favour the development of bacterial vaginosis and the prominent squamocolumnar junction of the perimenarcheal cervix with its decreased resistance to Chlamydia and a short cervix could allow the organisms to ascend more easily to the uterus.[17]

The frequencies of all other obstetric complications including hypertensive disorders of pregnancy, gestational diabetes, preterm premature rupture of membranes, poly/oligohydramnios, ante-partum haemorrhage, and post-partum haemorrhage were not significantly different in both groups. However a study from Lahore, Pakistan, has reported higher rates of pregnancy-induced hypertension, postpartum haemorrhage and puerperal sepsis in teenage mothers compared to older mothers.[18]

Our study showed a higher rate of instrumental delivery and a slightly lower rate of caesarean delivery among the teenagers while the vaginal delivery rates were similar between the two groups. A lot of controversy exists in the literature about the mode of delivery in teenage mothers. Some studies have reported increased rates of normal vaginal delivery and reduced rates of caesarean section and instrumental delivery for teenagers[12,13,15] whereas others have shown no significant difference in the mode of delivery between the teenagers and non-teenagers.[4,6,18] Findings similar to ours have been reported by a study from Jerusalem which also showed a higher rate of instrumental deliveries and a slightly lower rate of caesarean delivery rate among teenagers compared to adult women.[19] A higher risk of maternal mortality has been reported for adolescents under 15 years of age but not for those above 15.[20] In our study, there was no maternal death in the teenage group against one maternal death in the non-teenage group.

Our study did not show an increased risk of adverse perinatal outcome for teenage pregnancy except for meconium aspiration syndrome and post maturity, both of which were more than twice as common in infants of teenagers as in those of older mothers. Widely different perinatal outcomes have been reported by different studies. Some studies have suggested the teenage pregnancy to be associated with an increased risk of preterm birth, low birth weight infant, foetal or perinatal death.[3,5,14,15] However, other studies have shown no increases in these risks.[11,12,19,21] It was surprising to find a higher frequency of post term pregnancy among teenagers in our study since none of the other studies have reported this finding.

The conflicting results about obstetric outcome reported by various studies may partly be explained by the fact that different age groups of teenagers have been included in different studies e.g. 13-19,[5] 10-19,[21] 13-20[15] years. Many studies have suggested a normal outcome for the older teenagers while reporting adverse outcome for the younger teenagers.[4,6,18] We were not able to study the pregnancy outcome for young teenagers separately as almost 87% of our teenagers were 18 to 19 years old. Only 6 women were less than 17 years age and none was below 16 years. Secondly, some studies have included only primiparous teenagers while others have included multiparas too. Another important reason could be the different kinds of maternity care systems available in different countries. In many developed countries, the pregnant teenagers were more likely to be unmarried, foreign nationals, having less education and no regular income.[14,15,22] Some studies have quoted inadequate sex education, early age of first intercourse, poor knowledge and use of contraception, poor home circumstances and a high school drop out rate as reasons for poor outcome of teenage pregnancy.[15,23] Studies reporting good outcome of teenage pregnancy are from countries where high quality care is available free of charge to the entire pregnant population.[11,24]

In Pakistan, teenage pregnancy usually occurs within wedlock where family and social support is not usually a problem. However, because of their young age and generally a low socioeconomic status of women, these girls are not empowered to make their own decisions. Teenage is basically a time for growing up and the child is not physically and emotionally mature enough to reproduce. Hence, if the girl is taken out of school at this time and pressurized into marriage, it can cause considerable emotional stress. Furthermore, these young girls, having little or no knowledge of contraception, usually become pregnant soon after marriage which further aggravates the physical and psychological stress. Psychological distress has been reported to be an important predisposing factor for preterm labour by causing endocrine disturbances,[25] although our study did not show a significant increase in the risk of preterm labour for teenage mothers.

The main limitations of our study were, firstly, the sample size for teenage pregnancies was small and secondly, the women mostly belonged to 18-19 year age group. Thus, we were not able to study the pregnancy outcome for younger teenagers. One reason for only small number of teenage pregnant mothers attending the tertiary care hospitals might be that most of the teenage pregnant women are being attended by the traditional birth attendants. In that case, the maternal and foetal outcome of those pregnancies could be worse than what we observed in tertiary care hospitals. In addition, the outcome of pregnancies of those teenagers who became pregnant out of wedlock could not be documented. Further large scale

studies are required to determine the risks associated with teenage pregnancy.

Conclusion

Pregnant teenagers are at a higher risk of developing severe anaemia and chorioamnionitis and are more likely to have an instrumental delivery than non-teenagers. Post maturity and meconium aspiration syndrome are the neonatal complications seen in the teenage pregnancies.

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References

1. Patel R. Woman versus man. Oxford University Press, 2003.
2. Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan: National Institute of Population Studies and Macro International Inc. 2008).
3. Khan N, Jamal M, Maternal risk factors associated with low birth weight. J Coll Physicians Surg Pak 2003;13: 25-8
4. We the Children: End-Decade Review of the Follow-up to the World Summit for Children: Report of the Secretary-General (A/S-27/3). New York: United Nations, 2001.
5. Kumar A, Singh T, Basu S, Pandey S, Bhargava V. Outcome of teenage pregnancy. Indian J Pediatr 2007; 74: 927-31.
6. Goonewardene IM, Deeyagaha Waduge RP. Adverse effects of teenage pregnancy. Ceylon Med J 2005; 50: 116-20.
7. Chen XK, Wen SW, Fleming N, Demissie K, Rhoads GG, Walker M. Teenage Pregnancy and Adverse Birth Outcomes: A Large Population Based Retrospective Cohort Study. Int J Epidemiol 2007; 36: 368-73.
8. Isaranurug S, Mo-Suwan L, Choprapawon C. Differences in socio-economic status,service utilization, and pregnancy outcomes between teenage and adult mothers. J Med Assoc Thai 2006; 89: 145-51.
9. Taffa N. A comparison of pregnancy and child health outcomes between teenage and adult mothers in the slums of Nairobi, Kenya. Int J Adolesc Med Health 2003; 15: 321-9.
10. UNICEF. Early Marriage: A Harmful Traditional Practice. New York: United Nations, 2005.
11. Raatikainen K, Heiskanen N, Verkasalo PK, Heinonen S. Good outcome of teenage pregnancies in high-quality maternity care. The Eur J Public Health 2006; 16: 157-61.
12. Gupta N, Kiran U, Bhal K. Teenage pregnancies: obstetric characteristics and outcome. Eur J Obstet Gynecol Reprod Biol 2008; 137: 165-71.
13. Tufail A, Hashmi HA. Maternal and perinatal outcome in teenage pregnancy in a community based hospital. Pak J Surg 2008; 24: 130-4.
14. Keskinoglu P, Bilgic N, Picakciefe M, Giray H, Karakus N, Gunay T. Perinatal outcomes and risk factors of Turkish adolescent mothers. J Pediatr Adolesc Gynecol 2007; 20: 19-24.
15. Simoes VM, da Silva AA, Bettiol H, Lamy-Filho F, Tonial SR, Mochel. Characteristics of adolescent pregnancy in Sao Luis, Maranhao, Brazil. Rev Saude Publica 2003; 37: 559-65.
16. Watcharaseranee N, Pinchantra P, Piyaman S. The incidence and complications of teenage pregnancy at Chonburi Hospital. J Med Assoc Thai 2006; 89 Suppl 4: S118-23.
17. Simon CS, Beach RK, McGregor JA. Does Incomplete Growth and Development Predispose Teenagers to Preterm Delivery? A Template for Research. J Perinatol 2002; 22: 315-23.
18. Iqbal F, Azad S, Tayyab R. Obstetrical and fetal outcome in teenage primigravida. Ann King Edward Med Uni 2004; 10: 470-1.
19. Geist RR, BeythY, Shashar D, Beller U, Samueloff A. Perinatal outcome of teenage pregnancies in a selected group of patients. J Pediatr Adolesc Gynecol 2006; 19: 189-93.
20. Donoso Sina E, Becker Valdivieso J, Villarroel del Pino L. Birth rates and reproductive risk in adolescents in Chile, 1990-1999. Rev Panam Salud Publica 2003; 14: 3-8.
21. Pardo RA, Nazer J, Cifuentes L. Prevalence of congenital malformations and low weight at birth among teenage mothers. Rev Med Chil 2003; 131: 1165-72.
22. Faucher P, Dappe S, Madelenat P. Maternity in adolescence: obstetrical analysis and review of the influence of cultural, socioeconomic and psychological factors in a retrospective study of 62 cases. Gynecol Obstet Fertil 2002; 30: 944-52.
23. Iloki LH, Koubaka R, Itoua C, Mbemba Moutounou GM. Teenage pregnancy and delivery: 276 cases observed at the Brazzaville University Hospital, Congo. J Gynecol Obstet Biol Reprod (Paris) 2004; 33(1 Pt 1): 37-42.
24. Heinonen S, Saarikoski S. Reproductive risk factors of fetal asphyxia at delivery: a population based analysis. J Clin Epidemiol 2001; 54: 407-10.
25. Hedegaard M, Henriksen TB, SAbroe S, Secher NJ. Psychological distress in pregnancy and preterm delivery. BMJ 1993; 307: 234-9.