Enliven Archive
Intensifying Thoughts

Research www.enlivenarchive.org Enliven: Gynecology and Obstetrics

ISSN: 2377-5351

Teenage Pregnancy: Risk Factors, Outcomes, and Possible Targets for Prevention: A Retrospective Cohort Study

Alok Ash[1*], and Pearl Ogakwu[2]

[1]Consultant Obstetrician, Department of Obstetrics and Gynecology, Guy's and St. Thomas' Hospitals NHS Foundation Trust

[2]Division of Physiology, GKT School of Medicine, King's College London

*Corresponding author: Alok Ash, Department of Obstetrics and Gynecology, Guy's and St. Thomas' Hospitals NHS Foundation Trust, London, UK, Tel: +44 207 188 3649; Fax: +44 207 188 6855; E-mail: alok.ash@gstt.nhs.uk

Received Date: 1st August 2014

Accepted Date: 27th August 2014

Published Date: 1st September 2014

Citation: Ash A, Ogakwu P (2014) Teenage Pregnancy: Risk factor, Outcomes, and Possible targets for Prevention: A Retrospective Cohort Study. Enliven: Gynecol Obestet 1(1): 001.

Abstract

Aim : To identify the important risk factors as well as observe some short and long term maternal and perinatal outcomes associated with teenage pregnancy.

Methods: A retrospective cohort study of 142 teen age adolescent mothers was carried out over a 2 year period in an inner city teaching hospital and tertiary referral centre in South East London. Results were compared with a control group of 4004 22-29 year old pregnant women over the same period.

Results: Our study demonstrates associations between teenage pregnancy and some adverse outcomes, namely low birth weight, low Apgar scores and lower incidence of artificial first feed. But contrary to the published literature, no correlation was found with pre-eclampsia, fetal growth restriction, preterm labour, operative vaginal delivery and caesarean section.

Conclusion: Teen age pregnancy is not always associated with adverse perinatal outcome.

Keywords: Teenage pregnancy; Perinatal outcome; Low birth weight; Apgar score

Introduction

Teenage (adolescent) pregnancy is an important contemporary topic in perinatal medicine. At least 16 million teenage girls each year become adolescent mothers [1], 85% of which are unplanned [2,3].

Reported risk factors for adolescent childbearing include: lower socioeconomic background, financial instability, poor academic performances and low educational attainment at young age [4], behavioural or emotional problems during childhood, being born to a teenage mother and divorced or separated parents [5-7], involvement in crime [8], being in care [9], homeless [10], and truancy from school [10], and certain risky behaviour such as smoking, alcohol and illicit drugs.

Maternal morbidity is increased in teenage mothers, for example, maternal anaemia, infection, pre-eclampsia [1], pre-term birth [11], an increased risk of operative delivery, including Caesarean section (CS) [12] and forceps delivery [13,14]. Adverse perinatal outcomes are also more frequently experienced by teen age mothers with fetal growth retardation [15], low birth weight [16,17], higher incidence of low Apgar score (of <4 and <7), [18]. The risk of maternal mortality in some cases have been shown to be more than twice as high in adolescent girls compared to older women [19], with the adolescent girls aged 15 or below at even greater risk [20,21].

We carried out this cohort study on a sample of young teenage women to find out the background risk factors and some defined perinatal outcomes, compared to those of a relatively higher age group of mothers conventionally thought to enjoy an optimal perinatal outcome.

Materials and Methods

The study was based on a South East London population catered by St Thomas' Hospital, located in Lambeth, an area with one of the highest rates of teenage pregnancy in London (Office for National Statistics, 2010). The hospital has a team of community midwives devoted to the care of teenage mothers of 19 years or younger. The team (known as the Teen Phase Midwifery Team), set up in 2009, is made up of 6 midwives caring throughout pregnancy, labour and post-birth. This team works in a multi-professional manner, liaising with social care workers, family nurse partnerships, and other community based teams such as St Michael's fellowship in supporting and advising young parents.

On first contact at booking, and thereafter at birth, at postnatal discharge, and 6 months post-partum, the team collects and records information on personal details, lifestyle, pregnancy and labour details, and post-natal outcomes and problems, through a series of face-to-face as well as telephone interviews with structured questionnaires.

Study Design and Study Population

We conducted a retrospective cohort study over a two-year period from January 2010 to December 2011 of 142 pregnant teenage mothers. A sample of 4004 post-teenage mothers aged 22-29 years, who gave birth during the same period, is used as a control group to allow comparison and analysis of the key outcome measures (see below). The control group was specifically chosen between ages 22-29 years, as this age range is traditionally considered to have the most optimum pregnancy and perinatal outcome.

The Aim of the Study

The aim of this study is to observe prominent risk factors and adverse maternal and perinatal health outcomes within this group.

Outcome Measures

The study considers the risk factors within this population [parity, ethnicity, level of education, contraceptive use, relationship status, previous contact with social services and level of independence (assessed depending on living situation)], as well as observing the maternal and perinatal outcomes e.g., gestational age at delivery, mode of delivery, Apgar scores at 1 and 5 minutes, birth weight and type of first feed.

Data Source

St Thomas' Hospital's maternity database software, Healthware®, Version 5.7.6 iSOFTIBAHealth.

Data Collection

Data were collected by the Teen Phase team midwives at St Thomas' Hospital. Inclusion in the study group was restricted to pregnant females aged between 12-19 years having singleton births. Data were collected at specific intervals along the course of the pregnancy, during labour and after birth, with recording on pre-designed data collection forms, which were then securely stored away until the next point of information retrieval. Data were mainly collected by face-to-face interviews; however, at the 6-month follow-up, telephone interviews were conducted.

Antenatal Period

At booking, the young mothers were assigned a named midwife from the Teen Phase team to care for the whole pregnancy, labour and postnatal period. At the first visit, collected data included: age and parity, address, ethnicity, age on leaving education, contraceptive use, relationship status and current living condition. Pregnancy was monitored by this team as per the hospital guidelines.

Labour

Data on labour included information on the birth procedure and any complications, as well as neonatal details. Details of type of birth were recorded in the following groups (as pre-set codes in Healthware®): 'Spontaneous vertex delivery', 'Forceps', 'Ventouse', 'Caesarean section' and 'Emergency Caesarean section'. Birth complications of interest included: 'Breech birth', 'Premature birth', 'Failure to progress', 'MEC grade 1', 'MEC grade 2', 'MEC grade 3' (MEC = meconium-stained amniotic fluid), 'Fetal distress', 'PROM (premature rupture of membranes)', 'PPROM (preterm pre-labour rupture of membranes)', 'Antepartum bleed', 'Polyhydramnios' and 'Abnormal CTG'. Also recorded was the gestational age at delivery as one of three groups, very low gestational age <32 weeks, low (pre-term) gestational age 32-37 weeks, and term (mature) gestational age as ≥37 weeks. Relevant baby data collected were: Apgar scores were recorded as very low at ≤4, low between>4 and <7, or normal at ≥7, at 1 and 5 minutes after birth. Additionally, birth weights were recorded as low ≤2500g, or normal >2500g, and type of first feed recorded as breast or artificial was also observed.

Month Follow-up

At six months post-discharge, a further stage of information collection via telephone interview was carried out. The follow-up data included information on the use of contraception at 6 months, and the education or employment status of the teenage mother.

Data Analysis

In addition to simple arithmetic calculation, statistical analysis was carried out using software SPSS®, version Windows 21.0 for the specified outcome measures. Statistical analysis results were presented as frequencies and odds ratios (OR) with a 95% confidence interval (CI) through the use of multinomial logistic regression.

Results

Descriptive Data

Age range of pregnant adolescents was 13-19 years (mean=17.96), the control group age ranged from 22-29 years (mean=26.10). At first contact, 93% of girls presenting to the Teen Phase team were aged 16-19 years. The remaining 7% were aged 13-15 years (Table 1). Within the study period, births to adolescent girls made up 3.6% of the total number of births to women aged under 30 years.

Two girls from the sample did not provide any ethnicity data. Of the 140 patients, 28.6% were of 'White-British' origin, 22.9% of 'Black (British) - Caribbean' origin and 20.0% were of 'Black (British) - African' origin, whilst 0.7% of girls were of 'Asian' ethnicity (Table 2). Girls aged 17 and 18 years showed the highest frequency of all labour complications,31.1% and 28.8% respectively, in the cohort of pregnant adolescents (Figure 1).

Maternal Characteristics: Age and Mode of Delivery		Group 1	Group 2
		Number (%)	Number (%)
Age at first contact	13	1 (0.7)	0 (0.0)
	14	2 (1.4)	0 (0.0)
	15	7 (4.9)	0 (0.0)
	16	23 (16.2)	0 (0.0)
	17	44 (31.0)	0 (0.0)
	18	47 (33.1)	0 (0.0)
	19	18 (12.7)	0 (0.0)
	22	0 (0.0)	322 (8.0)
	23	0 (0.0)	353 (8.8)
	24	0 (0.0)	393 (9.8)
	25	0 (0.0)	504 (12.6)
	26	0 (0.0)	495 (12.4)
	27	0 (0.0)	567 (14.2)
	28	0 (0.0)	645 (16.1)
	29	0 (0.0)	725 (18.1)
Mode of delivery	Spontaneous vertex delivery	89 (73.0)	2564 (65.1)
	Forceps	6 (4.9)	219 (5.6)
	Ventouse	5 (4.1)	272 (6.9)
	Caesarean section	3 (2.5)	203 (5.2)
	Emergency caesarean section	19 (15.6)	678 (17.2)

Table 1: To show the distribution in age of pregnant adolescents and mode of delivery. Data shown as frequency (number)and percentage (%).

Ethnicity	Number (%)
White British	40 (28.6)
White European	11 (7.9)
Any other White background	2 (1.4)
Black (British)- African	28 (20.0)
Black (British)- Caribbean	32 (22.9)
Any other Black background	9 (6.4)
Mixed White and Caribbean	8 (5.7)
Any other Mixed background	2 (1.4)
Asian	1 (0.7)
Oriental background	3 (2.1)
Other ethnic group	4 (2.9)

Table 2: Table showing the distribution of teenage pregnancy based on ethnicity.

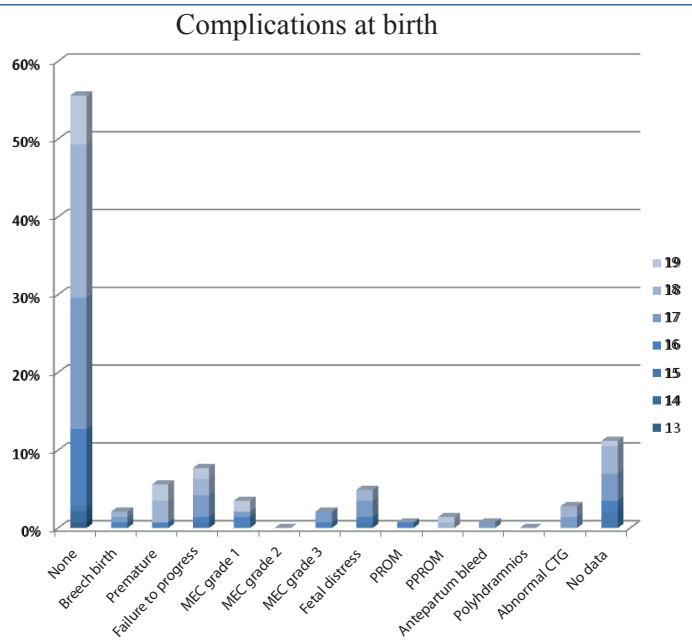

Figure 1 Graph to show the rate of labour related complications within the group of teenage mothers

With regard to living condition, of the 139 girls providing this data, 54.0% were living with both parents, 7.9% with mother only, 1.4% with father only, 2.2% with partner's family, 0.7% with another family member, 11.5% alone or with their partner, 9.4% in a hostel, 7.9% in some form of temporary accommodation, 1.4% in shared accommodation, and 3.6% in foster care. About previous contact with social care, of the girls providing this data, 25.6% reported 'yes', and 74.4% reported 'no'.

Of the pregnant adolescents, 58.1% had left formal education by age 16, with 30% still in education during pregnancy. By 6 months after childbirth, 60% of teenage mothers did not return to education or employment, the remaining 40% did re-enter formal education, employment or training (Figure 2).

Data on contraception use showed that 63.4% did not use any form of contraception at the time of conception. Among the girls using contraception, condoms were used by 18.3%, oral contraceptive pill by 1.0%, implant by 2.3%, injectable contraceptive by 0.8% and other forms of contraceptive by 2.3%. By 6 months after birth, 88% of contactable adolescents were using contraception, whilst the remaining 12% reported use of contraception as 'None' (Figure 3).

Initially at first contact, of the 133 girls providing details on their relationship status, 21.8% reported to be single, 76.7% had a partner, and 1.5% were married. By the 6-month follow up, of the 76 girls contacted, 61.8% were in a relationship, whilst 38.2% were single.

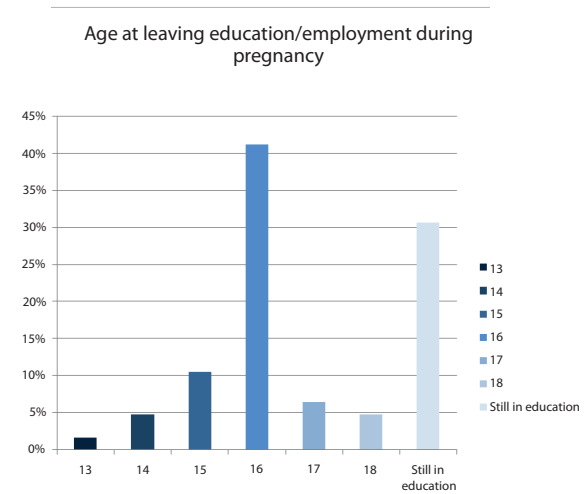

Figure 2a Bar graph to show the percentage of pregnant adolescents leaving education or employent between 13-19 years, alongside those remaining in education despite pregnancy

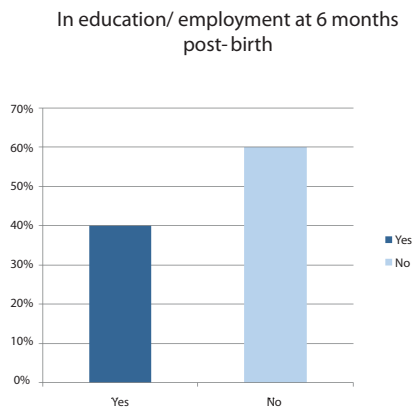

Figure 2b Bar graph to show the percentage of adolescent mothers returning to education or employment by 6 months postnatal, compared to those remaining out of education or employment 6 months after the birth of their child

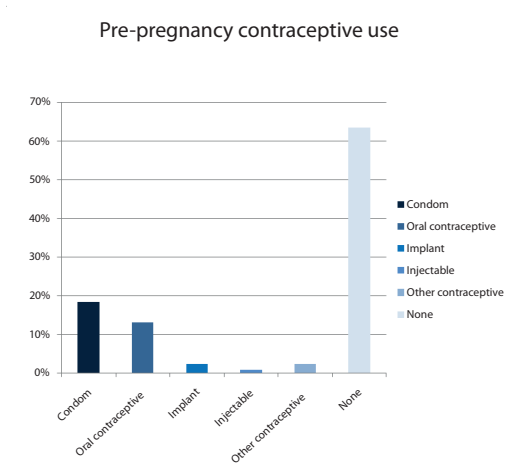

Figure 3a Percentage of pregnant adolescents using contraception, and the type of contraception used at the time of conception

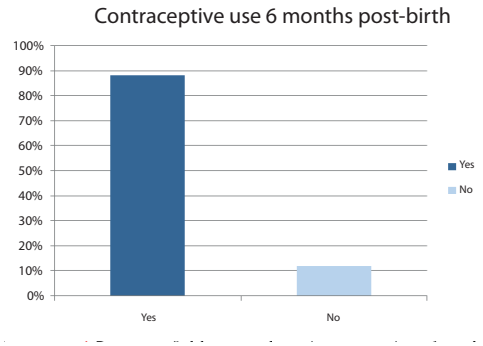

Figure 3b Percentage of adolescent mothers using contraception at 6 months after child birth

Inferential Data

For statistical analyses of outcome measure, data were coded into two groups, with parameters set as: Group 1, equal to age 13-19 years, and Group 2, equal to age 22-29 years.

Outcome measures observed included 'Mode of delivery', 'Apgar score at 1 minute', 'Apgar score at 5 minutes', 'Baby weight' and 'Type of first feed' (Table 3).

Baby Characteristics: APGAR score at 1 and 5 minutes, baby weight (g) and type of first feed		Group 1 Number (%)	Group 2 Number (%)
APGAR at 1 minute	≤4	5 (4.0)	152 (3.8)
	<7	6 (4.8)	181 (4.6)
	≥7	113 (91.1)	3626 (91.6)
APGAR at 5minutes	≤4	0 (0.0)	77 (1.9)
	<7	1 (0.8)	28 (0.7)
	≥7	123 (99.2)	3854 (97.3)
Baby weight in grams	≤2500	8 (6.5)	382 (9.6)
	<2700	11 (8.9)	127 (3.2)
	≥2700	105 (84.7)	3471 (87.2)
First feed	Breast	99 (81.8)	3341 (90.4)
	Artificial feed	22 (18.2)	355 (9.6)

Table 3: To show the Baby Characteristics: APGAR score at 1 and 5 minutes, baby weight (g) and type of first feed. Data shown as frequency (number) and percentage (%).

For analysis of delivery method, the reference category was selected as 'Spontaneous vertex delivery' for comparison of more complicated, operative deliveries to non-operative vaginal delivery. Group 1 patients were less likely than Group 2 to have a forceps delivery as opposed to spontaneous vertex delivery (OR= 0.789, 95% CI= 0.341-1.825, p= 0.580 NS). Additionally, Group 1 were also less likely to have a ventouse delivery (OR= 0.530, 95% CI= 0.210-1.315, p= 0.171 NS), elective Caesarean section (CS) (OR= 0.426, 95% CI= 0.134-1.357, p= 0.149 NS) or an emergency CS, (OR= 0.807, 95% CI= 0.488-1.334, p= 0.404 NS). When adjusted for parity as a confounding variable for mode of delivery, teenage mothers showed an overall decreased risk of forceps delivery (OR= 0.680, 95% CI= 0.293-1.577, p= 0.369 NS), ventouse (OR= 0.462, 95% CI= 0.185-1.150, p= 0.097 NS), elective CS (OR= 0.441, 95% CI= 0.138-1.406, p= 0.166 NS) and emergency CS (OR= 0.739, 95% CI= 0.446-1.224, p= 0.240 NS), in comparison to spontaneous vertex delivery (Table 4).

All Apgar scores at 1-min and 5-min were classified as very low ('≤4'), low ('>4 - <7') and normal ('≥7'). Any missing data was recorded as 'No data'. In Group 1, Apgar scores at 1 minute were recorded from 124 neonates, compared tom 3959 neonates in Group 2. The reference category was selected as '≥7' for comparison of adverse neonatal outcome with a healthy neonate. Results showed that neonates born to Group 1 mothers were more likely to have a very low Apgar score ('≤4') compared to '≥7' than neonates born to Group 2 mothers (OR= 1.056, 95% CI= 0.425-2.263, p= 0.907 NS). Additionally, neonates in Group 1 were more likely to score '>4- <7' rather than '≥7' than those in Group 2 (OR= 1.064, 95% CI= 0.462-2.451, p= 0.885 NS). 5-min Apgar score results showed that neonates born to Group 1 mothers were less likely to have an Apgar score of '≤4' compared to one of '≥7' than neonates in Group 2 (OR= 1.940 E-009, CI=1.940 E-009-1.940 E-009, p< 0.0001). In contrast, neonates in Group 1 were more likely to score '<7' rather than '≥7' (OR= 1.119, CI= 0.151-8.291, p= 0.912 NS).

Birth weight (g), was recorded as low birth weight (LBW) (≤2500g), or normal weight (>2500g). Any missing data was recorded as 'No data'. Data was obtained from 124 patients in Group 1 and 3980 patients in Group 2. The reference category was selected as '>2500g' to allow comparison between normal and LBW. Babies in Group 1 were less likely to have a LBW compared to Group 2 (OR= 0.65, CI= 0.315-1.340, p= 0.243 NS). Adjustment for gestational age did not alter the OR (OR= 0.671, 95% CI= 0.271-1.665, p= 0.390 NS) compared to normal gestational weight of >2500g (Table 5).

The final outcome measured in 121 Group 1 patients and 3696 Group 2 patients, was 'Type of first feed'recorded as either 'Breast' or 'Artificial', with reference category set as 'Artificial'. Any missing data was recorded as 'No data'. Results showed that mothers in Group 1 were less likely (statistically significant) to breast feed their newborn babies than those in Group 2 at the time of first feed compared to feeding with artificial methods (OR= 0.478, CI= 0.297-0.769, p= 0.002).

Mode of delivery	Parity											
	0		1		2		3		4		5	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
	Number (%)											
Spontaneous vertex delivery	64 (70.3)	1417 (58.6)	18 (78.3)	760 (75.3)	5 (83.3)	283 (77.3)	2 (100)	79 (73.8)	0 (0)	15 (83.3)	0 (0)	3 (50.0)
Forceps	5 (5.5)	188 (7.8)	1 (4.3)	22 (2.2)	0 (0)	3 (0.8)	0 (0)	5 (4.7)	0 (0)	0 (0)	0 (0)	0 (0)
Ventouse	5 (5.5)	222 (9.2)	0 (0)	36 (3.6)	0(0)	10 (2.7)	0 (0)	3 (2.8)	0 (0)	0 (0)	0 (0)	0 (0)
Caesarean section	3 (3.3)	103 (4.3)	0 (0)	55 (5.5)	0 (0)	35 (9.6)	0 (0)	9 (8.4)	0 (0)	0 (0)	0 (0)	1 (16.7)
Emergency caesarean section	14 (15.4)	490 (20.2)	4 (17.4)	136 (13.5)	1 (16.7)	35 (9.6)	0 (0)	11 (10.3)	0 (0)	3 (16.7)	0 (0)	2 (33.3)

Table 4: Data showing the contribution of parity on delivery outcomes in both groups of mothers aged 13-19 years (Group 1) and aged 22-29 years (Group 2).

Birth Weight data		Gestational Age (weeks)					
		<32 (very preterm)		>32- <37 (preterm)		≥37 (mature - term)	
		Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
		Number (%)					
Baby weight (g)	≤2500	2 (100)	94 (92.2)	1 (16.7)	139 (61.8)	5 (4.4)	148 (4.1)
	>2500	0 (0)	8 (7.8)	5 (83.3)	86 (38.2)	109 (95.6)	3504 (95.9)

Table 5: Table showing the association between gestational age and birth weight in neonates born to mothers aged 13-19 years (Group 1) in comparison to babies born to mothers aged 22-29 years (Group 2)

Discussion

Our study shows, compared to mothers aged 22-29 years (Group 2), 13-19 year old mothers (Group 1) were 21.1% less likely to have a forceps delivery, 47.0% less likely to have a ventouse delivery, 57.4% less likely to have an elective CS, and 19.3% less likely to have an emergency CS. However, these results did not show any statistical significance. This is in contrast to the popular belief that teenage mothers are at an increased risk of complicated and operative delivery. However, controversy exists in the literature, some studies reporting a higher risk of prolonged labour [22], operative vaginal delivery [20], and CS [14], but othersshowing a refuced risk of CS or induction of labour in adolescent pregnants [19,11].

We also considered the impact of parity on the mode of delivery in both teenage mothers (Table 4), as this has been suggested a confounding factor for delivery outcomes [23]. In general, 70.3% of Para 1 teenage mothers had a spontaneous vertex delivery. This incidence increased consistently with increasing parity: 78.3% inpara 2, 83.3% in para 3, and 100% inpara 4. These findings correspond with the literature suggesting that nulliparous women have a higher liklihood of complicated delivery.

As a measure of neonatal outcome, Apgar score at 1 minute and 5 minutes of neonates born to both teenage and post-teenage mothers did not show statistical significance, but babies born to teenage mothers were over 5% and 6% more likely to score ≤4 and 4-7 respectively, at 1 minute. At 5 minutes, Group 1 babies were 99.9% less likely to score ≤4, but almost 12% more likely to score 4-7, compared to Group 2.

Though statistically not significant, these results suggest an increased risk of both very low (≤4) and low (4-7) Apgar scores at 1 minute for babies in Group 1 compared to Group 2. However there was some discrepancy in the results at 5 minutes: though babies born to teenage mothers had an increased risk of low Apgar score at 5 minutes, the risk of very low Apgar score at 5 minutes was lower than babies born to 22-29 year olds. This discrepancy, along with the lack of statistical significance, is likely due to the limited sample size of Group 1 mothers. Alternatively, it is possible that better attention and neonatal care of the infants born with Apgar scores ≤4 might have explained improved Apgar scores at 5 minutes in these babies.

Our data showed that babies born to teenage mothers were 35% less likely to weigh ≤2500g as opposed to >2500g compared to babies born to control mothers. Low and very low birth weight, often in association with pre-term birth has been reported in the literature to be more common in the adolescent mothers, compared to older pregnant women [24], thus discrepant with our finding. However, adjusted odds ratios for birth weight against gestational age, showed a slight decrease from the crude values; suggesting that gestational age did not seem to have an adverse effect on birth weight. We are unable to explain this discrepancy; it could be argued that the dedicated antenatal care offered by the Teen Phase team may have resulted in an improved birth weight. Babies in Group 1 showed a slightly lower overall rate of very preterm (<32wks) or preterm (<37wks) birth, 6.6% compared to 8.2% in Group 2 cohort. However, babies born very preterm (<32 weeks) in Group 1 showed a slightly lower count of low birth weight (compared to Group 2), though it should be noted that overall 92.2% of babies in this group born very pre term weighed <2500g. In contrast, of the babies born preterm (<37 weeks), the teenage cohort showed a significantly lower percentage of babies born with LBW compared to the control cohort. Of the babies born ≥37 weeks, in both teenage or adult mothers cohort, similar rates in birth weight were observed, with the majority of babies in each cohort, 95.6% and 97.4% in Group 1 and Group 2 respectively, weighing >2500g (Table 5). These findings therefore were in partial agreement with the literature.

In terms of feeding method, compared to older mothers, teenage mothers were 52% less likely to breastfeed their newborns at the time of first feed. Research shows young women from more deprived areas are less likely to breastfeed for a number of reasons, for example, lack of access to information or support, embarrassment and anxieties about breastfeeding in public, or lack of help from breastfeeding advocates (particularly in lower socioeconomic groups) [25]. Unfortunately there was no information in our study about these contributing factors, if any. This may be one area to improve data collection in future.

Within Group Analysis of Various Factors of the Teenage Mother Cohort

Ethnicity is known to be a very important determinant of teenage pregnancy. In this study 'White-British' cohort presented with the highest frequency (28.6%), followed by the 'Black (British) Caribbean' population (22.9%) and the 'Black (British) African' population (20.0%), with the lowest rate (0.7%) observed in the 'Bangladeshi' population. These findings were consistent with published data [26]. However it is possible that certain ethnic groups are over- or under-represented. The majority (46.48%) of pregnant adolescents in the study came from the London borough of Southwark, a borough where 52% of the population are 'White British'; this therefore suggests a possible over representation of, but proportionate to, this population in this study. The 'Bangladeshi' population make up only 1% of those living in Southwark [27], therefore suggesting under-representation.

Literature suggests the younger the age of the pregnant adolescent, the higher is the potential risk of pregnancy and labour complications [21,28,29]. But from our study no valid conclusions could be drawn, as majority of pregnant adolescents with labour complications belonged to the age range of 16-19 years with only a very small number in the 13-15 years range (Figure 1) with disproportionate skew towards the former group.

Published studies have suggested that adolescents in care or having had previous contact with social services are at a higher risk of adolescent pregnancy [9]. Our results however did not support this, as the majority of girls in the study (74.4%) reported no previous contact with social services. Instead, a large proportion (66.2%) was living with both or either of their parents, their partner's family or another family member.

In our study 78.2% of the pregnant adolescents at first contact were being married or in a relationship. Although at 6 month follow-up, a fair proportion (61.8%) still had partners, this number had fallen by 16.4% since the initial interview. This is important as presence of the father during rearing of a child improves social and cognitive child development [30].

Early school leavers were high in number: 58% not being in formal education by age 16. This rose to 65% when considering all girls in the sample of 18 years or younger. Only 30% of the girls remained in education during their pregnancy. Among all contactable mothers at 6 months post-partum, only 40% had re-entered some form of formal education, employment or training (Figure 2). Age of school leaving is a major risk factor in teenage pregnancy, as well as adverse outcomes in later life for both mother and child [31].

With regard to contraceptive use, although more than 50% of adolescents are sexually active by age 19, less than half of them use contraception at first sexual intercourse [32]. In our study, 63.36% reported using no contraception. Condom was the most popular of contraceptives, andinjectablesthe least popular (Figure 3). At 6 month follow-up, data was limited: only 76 out of 142 were contactable. Nonetheless, almost 90% of them reported active use of contraception. These results are encouraging, and suggest that contraception advice by the Teen Phase team was effective. This would be an important message for the policy makers.

Strengths and Weaknesses of this Study and Challenges Faced

There were a number of strengths of our study. Firstly, there is a dedicated Teen Phase Midwifery Team with a specific target population. Secondly, each pregnant adolescent was allocated a trained named midwife, thus assuring continuity of care. Thirdly, early access and repeated contact allowed close monitoring of pregnancy and any complication. However, there were a number of limitations, the most important being the limited population size of pregnant adolescents, coupled with some missing data and subsequent loss of patients at each stage of follow-up.

Conclusion

In conclusion, despite some limitations, our study highlights a number of important areas to consider to improve outcomes of teenage pregnancy, as well as developing strategies to target the risk factors, for example, ethnicity, age of school leaving, and use of contraceptives. Furthermore, effective strategies for re-entering education or employment are required in order to improve long term outcomes for both mother and child.

The findings are important locally, as South East London is a region of great diversity, not only in terms of ethnicity and culture, but there is also great variation in the distribution of wealth and health standards. On this basis, it may be opined that generalisability of our results based on an inner city South East London population may be limited for other populations.

References

1. http://www.who.int/mediacentre/factsheets/fs364/en/
2. http://www.jrf.org.uk/sites/files/jrf/9781859355046.pdf
3. Paranjothy S, Broughton H, Adappa R, Fone D (2009) Review: Teenage pregnancy: who suffers? Arch Dis Child 94: 239-245.
4. Swann C, Bowe K, McCormick G, Kosmin M (2003) Teenage Pregnany and Parenthood: A review of reviews.
5. http://www.jrf.org.uk/publications/social-backgrounds-and-post-birth-experiences-young-parents
6. Fergusson DM, Woodward LJ (2000) Teenage Pregnancy and Female Educational Underachievement: A Prospective Study of a New Zealand Birth Cohort. J Marriage Fam Rev 62: 147-161.
7. Furstenburg F, Kiernan K (2001) Delayed parental divorce: how much do children benefit? J Marriage Family 63: 446-457.
8. Botting B, Rosato M, Wood R (1998) Teenage mothers and the health of their children. Population trends 93:19-28.
9. Biehal N (1995) Moving on: Young people and leaving care schemes. London: Her Majesty's Stationary Office.
10. Kiernan K (1995) Transition to parenthood: Young Mothers, Young fathers – associated factors and later life, London: Welfare State Programme 113, Suntory-Toyota International Centre for Economics and Related Disciplines, London School of Economics.
11. Zhang B, Chan A (1991) Teenage pregnancy in South Australia, 1986-1988. Aust NZ J Obstet Gynaecol 31: 291-298.

12. Moerman ML (1982) Growth of the birth canal in adolescent girls. Am J Obstet Gynaecol 143: 528-532.
13. Konje JC, Palmer A, Watson A Hay DM, Imrie A et al. (1992) Early teenage pregnancies in Hull. Br J Obstet Gynaecol 99: 969-973.
14. Bacci A, Manhica GM, Manchungo F (1993) Outcome of teenage pregnancy in Maputo, Mozambique. Int J Gynaecol Obst 40: 19-23.
15. Elster AB (1984) The effect of maternal age, parity, and prenatal care on perinatal outcome in adolescent mothers. Am J Obstet Gynaecol 149: 845-847.
16. Lao TT, Ho LF (1997) The obstetric implications of teenage pregnancy. Hum Reprod 12: 2303-2305.
17. Naeye RL (1981) Teenaged and pre-teenaged pregnancies: consequences of the fetal-maternal competition for nutrients. Paediatrics 67: 146-150.
18. Chen XK, Wen SW, Fleming N, Demissie K, Rhoads GG, et al. (2007) Teenage pregnancy and adverse birth outcomes: a large population based retrospective cohort study. Int J Epidemiol 36: 368–373.
19. McIntyre P (2003) Pregnant Adolescents: Delivering on Global Promises of Hope.
20. Conde-Agudelo A, Beleza´n JM, Lammers C (2005) Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: Cross-sectional study. Am J Obstet Gynecol 192: 342-249.
21. Satin AJ, Leveno KJ, Sherman ML, Reedy NJ, Lowe TW, et al. (1994) Maternal youth and pregnancy outcomes: middle school vs high school age groups compared with women beyond the teen years. Am J Obstet Gynecol 171: 184-187.
22. Zabin LS, Kiragu K (1998) The health consequences of adolescent sexual and fertility behaviour in sub-Saharian Africa. Stud Family Plann 29: 210-232.
23. Scholl TO, Hediger ML, Belsky DH (1994) Prenatal Care and Maternal Health During Adolescent Pregnancy: A Review and Meta-analysis. J Adolescent Health 15: 444-456.
24. Mahavarkar SH, Madhu CK, Mule VD (2008) A comparative study of teenage pregnancy. J Obstet Gynaecol 28: 604-607.
25. Scott JA, Mostyn T, Greater Glasgow Breastfeeding Initiative Management Team (2003) Women's experiences of breastfeeding in a bottle-feeding culture. J Hum Lact 19: 270-277.
26. Gerard Lemos (2009) Freedom's Consequences: Reducing teenage Pregnancies and their negative effects in the UK, Lemos & Crane, London
27. http://www.peckhamforum.org.uk/wp-content/uploads/2012/12/7-i-Peckham-Community-Council-Profile.pdf
28. Fraser AM, Brockert JE, Ward RH (1995) Assocation of young maternal age with adverse reproductive outcomes. N Engl J Med 332: 1113-1117.
29. Amini SB, Catalano PM, Dierker LJ, & Mann LI, (1996) Births to teenagers: Trends and obstetric outcomes. Obstet Gynaecol, 87: 668–674.
30. Cooley ML, Unger DG, (1991) The Role of Family Support in Determining Developmental Outcomes in Children of Teen Mothers. Child Psychiat Hum Dev 21: 217-234.
31. Kiernan KE (1997) Becoming a Young Parent: A Longitudinal Study of Associated Factors. Br J Sociol 48: 406-428.
32. Harris S (1990) Teenage Pregnancy and Contraception. Einstein Q J Biol Med 8: 83-89.