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Outcomes of Teenage Pregnancy in Patients Presenting at Ayub Teaching Hospital Abbottabad

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ABSTRACT

Background: Teenage pregnancy is a major public health issue and it is associated with poor maternal and neonatal outcomes, especially in low resource settings where antenatal care is limited. **Objective:** To determine the frequency of outcomes of teenage pregnancy in patients presenting at a tertiary care hospital. **Study Design:** Prospective Cohort study. **Duration and Place of Study:** This study was conducted from 19th March 2025 to 19th June 2025 at Department of Obstetrics and Gynaecology, Ayub Teaching Hospital Abbottabad. **Methodology:** Total 98 teenage pregnant patients aged 13–19 years were included. Patients with singleton pregnancy and gestational age >24 weeks were selected, while those with medical disorders and fetal anomalies were excluded. Outcomes including anaemia, preterm delivery, low birth weight, low Apgar score and caesarean delivery were assessed. Data was analysed using IBM Statistical Package for Social Sciences version 26. **Results:** Mean age was 15.74 ± 1.80 years. Anaemia was most common outcome seen in 74 (75.50%) patients, followed by preterm delivery 64 (65.30%), low birth weight 54 (55.10%), low Apgar score 39 (39.80%) and caesarean delivery 27 (27.60%). Low birth weight showed significant association with age ($p<0.001$) and parity ($p=0.002$), while gestational age was significantly associated with preterm delivery ($p<0.001$) and low birth weight ($p=0.001$). **Conclusion:** Teenage pregnancy is associated with high frequency of adverse outcomes, particularly anaemia, preterm delivery and low birth weight.

INTRODUCTION

Adolescent pregnancy is a significant public health problem in both developing and developed countries around the world. It is commonly described as pregnancy in females aged 13-19 years.[1] This condition is associated with a number of social, economic, and health problems. Adolescent mothers have a low educational level, poor nutrition, and limited access to quality prenatal care services.[2] The immaturity of their body is associated with a number of complications during pregnancy and labor. These pregnancies are unplanned in most cases and are associated with poor prenatal care and poor follow-up in later pregnancy, thus increasing the risk of complications during pregnancy and labor.[3]

Preterm birth is a significant outcome of teenage pregnancies and is most often attributed to biological immaturity and substandard antenatal care.[4] Infants born before 37 weeks of gestation are prone to an increased risk of respiratory problems, infections, and mortality.[5] Low birth weights are also commonly seen among infants of teenage mothers and are most often attributed to poor nutrition and substandard development of the placenta.[6] A low Apgar score is also a significant outcome of a neonate born to a teenage mother and is most often attributed to substandard neonate condition after birth. The neonate may need resuscitation and intensive care in a neonatal intensive care unit, thereby increasing health care costs.[7] The outcomes are most often seen among teenage mothers compared to adult mothers.

In addition, adolescent pregnancy is also associated with an increased risk of caesarean section, although attempts at normal vaginal delivery are possible in some cases, with complications arising from cephalopelvic disproportion and prolonged labor.[8] Anemia is another major concern among adolescent pregnant women, mainly because of increased nutritional demands, dietary habits, and lack of iron supplements.[9] Anemia during pregnancy is known to cause tiredness, increased susceptibility to infections, and adverse pregnancy outcomes such as preterm birth and low birth weight.[10]

Abbottabad embodies a developing region where teen pregnancy remains a major but under investigated public health problem. There is a scarcity of data on maternal and child health in this region, which may influence intervention strategies in this regard. Socioeconomic disparities, early marriage, and substandard antenatal

care services in this region may also influence pregnancy outcomes. Therefore, this research is needed to provide evidence, increase knowledge of associated risks, and guide the development of appropriate intervention strategies for this population in particular.

METHODOLOGY

This descriptive study was carried out at Department of Obstetrics and Gynaecology, Ayub Teaching Hospital Abbottabad, over the period from 19th March 2025 to 19th June 2025. Approval was taken from the institutional ethical committee before start of study, and study was conducted according to standard ethical principles. The sample size was 98, which was calculated by using WHO sample size calculator with 95% confidence level, margin of error 7%, and expected frequency of low Apgar score 14.6% in teenage pregnancy.[11] Teenage pregnancy was taken as pregnant girl having age 13–19 years, confirmed on positive urine hCG test and ultrasound. Eligibility of patients was assessed on predefined criteria.

Inclusion Criteria

Girls with age 13–19 years, singleton pregnancy on ultrasound, gestational age >24 weeks on ultrasound, and any parity were included.

Exclusion Criteria

Patients having history of diabetes, hypertension, autoimmune diseases, and those with major fetal anomalies on ultrasound were excluded from study.

After taking permission from ethical committee, all eligible patients were enrolled. Written informed consent was obtained after proper explanation regarding purpose, risks and benefits of study. Basic demographic details including age, gestational age, parity, residential status, education level and socioeconomic status were recorded. Detailed history and clinical examination were done for all patients. All the female subjects were followed up to the point of delivery, and the results were noted. The subjects were monitored during the antenatal period, as well as during the time of delivery, to observe the adverse outcomes. The study of the adverse outcomes included anemia, cesarean delivery, preterm delivery, low birth weight, and low Apgar score. The study of anemia included the subjects whose hemoglobin levels were less than 10 g/dL, as confirmed by lab results. Cesarean delivery included the subjects whose babies were delivered through an incision in the abdomen, which is about 6-7 inches in depth, followed by a uterine incision of about 5-6 inches in depth to facilitate delivery. Preterm delivery included the subjects whose babies were born before the gestational age of 37 weeks, while low birth weight included the subjects whose babies weighed less than 2.5 kg, as measured on a weighing scale. Low Apgar score included the subjects whose babies had an Apgar score of less than 5 after 1 minute of delivery.

Data was analysed using IBM SPSS version 26. Qualitative variables such as residential status, education level, socioeconomic status, preterm delivery, low birth weight, low Apgar score, cesarean delivery and anemia were presented as frequency and percentage n(%). Quantitative variables including age, gestational age and parity were presented as mean ± standard deviation. Stratification of outcomes was done with respect to age, gestational age, parity, residential status, education level and socioeconomic status. Post-stratification chi-square test or Fisher's exact test was applied and p ≤0.05 was taken as statistically significant.

RESULTS

The mean age of the participants was 15.74 ± 1.80 years, with a mean gestational age of 36.33 ± 2.76 weeks and mean parity of 0.14 ± 0.48. The majority of the patients were from rural areas, accounting for 71 patients (72.4%), whilst urban residents constituted 27 patients (27.6%). Regarding educational attainment, uneducated and primary-level educated patients were equally distributed, each comprising 38 patients (38.8%), followed by secondary level education in 20 patients (20.4%), and higher education in only 2 patients (2.0%). In terms of socioeconomic status, the majority belonged to the poor category with 50 patients (51.0%), followed by middle class in 40 patients (40.8%), and rich in 8 patients (8.2%) (Table 1).

Table 1

Patient Demographics

Demographics		Mean ± SD
Age (years)		15.74 ± 1.80
Gestational Age (weeks)		36.33 ± 2.76
Parity		0.14 ± 0.48
Residential Status	Rural n (%)	71 (72.4%)
	Urban n (%)	27 (27.6%)
Education Level	Uneducated n (%)	38 (38.8%)
	Primary n (%)	38 (38.8%)
	Secondary n (%)	20 (20.4%)
	Higher n (%)	2 (2.0%)
Socioeconomic Status	Poor n (%)	50 (51.0%)
	Middle n (%)	40 (40.8%)
	Rich n (%)	8 (8.2%)

Amongst the obstetric and neonatal outcomes recorded, anaemia was the most frequently observed complication, present in 74 patients (75.50%), followed by preterm delivery in 64 patients (65.30%), low birth weight in 54 patients (55.10%), low Apgar score in 39 patients (39.80%), and caesarean delivery in 27 patients (27.60%) (Table 2).

Table 2

Frequency of Outcomes Among Teenage Pregnancy

Outcomes	Frequency	% age
Anaemia	74	75.50%
Cesarean delivery	27	27.60%
Preterm delivery	64	65.30%
Low Birth Weight	54	55.10%
Low Apgar Score	39	39.80%

In the stratified analysis examining the association of demographic factors with outcomes of teenage pregnancy, anaemia was observed in 36 patients (73.5%) amongst those aged ≤15 years and in 38 patients (77.6%) amongst those aged >15 years, with no statistically significant association (p=0.638). Preterm delivery was present in 33 patients (67.3%) in the ≤15 years group and 31 patients (63.3%) in the >15 years group (p=0.671). Low birth

weight, however, demonstrated a statistically significant association with age group, being present in 19 patients (38.8%) in the ≤15 years group compared to 35 patients (71.4%) in the >15 years group (p<0.001). Low Apgar score was found in 22 patients (44.9%) and 17 patients (34.7%) in the ≤15 and >15 years groups respectively (p=0.302). Caesarean delivery was recorded in 16 patients (32.7%) in the younger group and 11 patients (22.4%) in the older group (p=0.258) (Table-III). When stratified by gestational age, preterm delivery was observed in all 48 patients (100.0%) with gestational age ≤36 weeks, compared to 16 patients (32.0%) in those with gestational age >36 weeks, with a highly significant association (p<0.001). Low birth weight was present in 34 patients (70.8%) and 20 patients (40.0%) in the ≤36 weeks and >36 weeks groups respectively (p=0.001). Anaemia was noted in 38 patients (79.2%) in the ≤36 weeks group and 36 patients (72.0%) in the >36 weeks group (p=0.410). Caesarean delivery occurred in 13 patients (27.1%) and 14 patients (28.0%) respectively (p=0.919), whilst low Apgar score was present in 23 patients (47.9%) and 16 patients (32.0%) in the respective groups (p=0.656) (Table-III). Regarding parity, in patients with parity ≤1, anaemia was seen in 69 patients (74.2%), preterm delivery in 60 patients (64.5%), low birth weight in 51 patients (54.8%), low Apgar score in 37 patients (39.8%), and caesarean delivery in 27 patients (29.0%). Amongst those with parity >1, anaemia was present in all 5 patients (100.0%), preterm delivery in 4 patients (80.0%), low birth weight in 3 patients (60.0%), and low Apgar score in 2 patients (40.0%), with no caesarean deliveries recorded (0.0%). A statistically significant association was found between parity and low birth weight (p=0.002), whilst no significant associations were observed for anaemia (p=0.330), preterm delivery (p=1.000), low Apgar score (p=0.108), or caesarean delivery (p=0.318) (Table 3).

Table 3

Association of Demographic Factors with Outcomes of Teenage Pregnancy

Demographic Factors		Anaemia n(%)	p-value	Cesarean n(%)	p-value	Preterm delivery n(%)	p-value	LBW n(%)	p-value	Low Apgar n(%)	p-value
Age Group	≤15	36 (73.5%)	0.638	16 (32.7%)	0.258	33 (67.3%)	0.671	19 (38.8%)	<0.001*	22 (44.9%)	0.302
	>15	38 (77.6%)		11 (22.4%)		31 (63.3%)		35 (71.4%)		17 (34.7%)	
Gestational Age	≤36 weeks	38 (79.2%)	0.410	13 (27.1%)	0.919	48 (100.0%)	<0.001*	34 (70.8%)	0.001	23 (47.9%)	0.656*
	>36 weeks	36 (72.0%)		14 (28.0%)		16 (32.0%)		20 (40.0%)		16 (32.0%)	
Parity	≤1	69 (74.2%)	0.330*	27 (29.0%)	0.318	60 (64.5%)	1.000*	51 (54.8%)	0.002	37 (39.8%)	0.108
	>1	5 (100.0%)		0 (0.0%)		4 (80.0%)		3 (60.0%)		2 (40.0%)	

*Fischer Exact Test

DISCUSSION

The mean age was found to be 15.74 ± 1.80 years, and this reflects the reality that exists among young, disadvantaged groups. The majority of patients presented from the rural areas, totaling 71 patients (72.4%), and this reflects the disadvantaged status of these groups, whose lack of access to healthcare, family planning, and educational facilities contributes to the high incidence of teenage pregnancies. Anemia was found to be the most common complication, and this was observed among 74 patients (75.50%). This reflects the high nutritional demands required for the development and pregnancy among young girls, coupled with the poor nutritional habits among disadvantaged groups, which contribute to anemia among pregnant teenagers. Preterm labor was observed among 64 patients (65.30%), and this reflects a high incidence. It is postulated that the premature onset of labor among pregnant teenagers reflects an immature reproductive system, inadequate antenatal care, and poor nutritional status, resulting in the premature onset of labor before the completion of the full gestational period.[12] Low birth weights were observed among 54 patients (55.10%), and this showed a significant association with age groups (p < 0.001) and parity (p = 0.002). Younger mothers at or below 15 years of age showed a lower incidence of low birth weight (19 patients, 38.8%) than the older teenage group (above 15 years) (35 patients, 71.4%). This could be due to the fact that the older teenage group may have experienced multiple pregnancies and nutritional depletion due to previous pregnancies. The poor utero-placental circulation of the teenage mothers could further compromise the fetus's nutrition supply. The gestational age of the patients correlated significantly with preterm delivery and low birth weight (p < 0.001 and p = 0.001, respectively). All patients with a gestational age of 36 weeks or less experienced preterm delivery (48 patients, 100.0%), and low birth weight was observed in 34 of these patients (70.8%). This is biologically plausible because the weight gain of the fetus occurs mainly during the third trimester of pregnancy, and therefore, a premature birth would result in the deprivation of the fetus of the required growth period. The cesarean delivery rates were 27 (27.60%), which is relatively low when compared with the expected rates and could possibly be due to the lack of facilities in rural areas where the majority of the patients resided.

The mean age of teenage mothers in the present study was 15.74 ± 1.80 years, which is comparatively lower than that reported by Mahesar *et al.* [12] and Shaikh *et al.* [13] where mean ages was 17.35 ± 1.06 years in both studies, and also lower than Mehmood *et al.* [14] who reported mean age of 17.88 ± 1.42 years. This difference is possibly reflecting the higher prevalence of very early marriages in the study population. Majority of patients was from rural background 71 (72.4%), which is consistent with findings of Ngimwichi *et al.* [15] where 72% of teenage mothers was also from rural areas, suggesting that rural residency is a shared contributing factor across different geographic settings.

Anaemia was the most frequently observed complication

in this study, present in 74 patients (75.50%), which is considerably higher than rates reported by Mahesar *et al.* [12] at 35.89%, Gul *et al.* [16] at 25.4%, Shaikh *et al.* [13] at 34.2%, Ngimwichi *et al.* [15] at 59.7%, and Suboohi *et al.* [17] at 32%. However, Sarkar *et al.* [18] and Ijaz *et al.* [19] also reported anaemia as a predominant complication amongst teenage mothers, supporting this finding. The higher rate of anaemia in current study may be attributed to the younger mean age and predominantly poor socioeconomic status 50 (51.0%) of the study participants, where dietary deficiency and iron depletion is more pronounced.

Preterm delivery was observed in 64 patients (65.30%), which is notably higher than figures reported in most comparable studies. Mahesar *et al.* [12] reported preterm delivery in 23.07%, Gul *et al.* [16] in 44.6%, Shaikh *et al.* [13] in 23.9%, Ngimwichi *et al.* [15] in 14.8%, Suboohi *et al.* [17] in 8%, and Zada *et al.* [20] in 15.8%. The considerably elevated rate in present study is possibly explainable by the lower mean gestational age at presentation 36.33 ± 2.76 weeks, younger maternal age, and limited antenatal care access in rural populations, all of which is known to predispose towards premature uterine contractility due to immature cervical and hormonal mechanisms.

Low birth weight was found in 54 patients (55.10%), which is again higher than most published literature. Mehmood *et al.* [14] reported low birth weight in 41.7%, Zada *et al.* [20] in 24.5%, Shaikh *et al.* [13] in 21.57%, Ngimwichi *et al.* [15] in 12.9%, and Suboohi *et al.* [17] in 11%, whilst Sarkar *et al.* [18] reported a significantly higher odds ratio (OR=3.6, p=0.05) for low birth weight in teenage pregnancies. The high rate in this study is likely a consequence of the elevated preterm delivery rate, as foetal weight gain predominantly occurs in the later weeks of gestation, and delivery before 36 weeks is directly associated with reduced birth weight.

Caesarean delivery rate was 27 (27.60%), which is comparable to Gul *et al.* [16] who reported 29.9% and Shaikh *et al.* [13] who reported 33.33%, however Zada *et al.* [20] reported a much higher rate of 44.6%. The relatively moderate caesarean rate in this study may be reflecting the limited availability of operative delivery facilities in rural healthcare settings, where majority of patients in this study was belonging. Low Apgar score was present in 39 patients (39.80%), which is higher than 16.7% reported by Mehmood *et al.* [14] and this difference is likely attributable to the higher rates of prematurity and foetal growth restriction observed in the current study population, both of which is known to adversely affect neonatal adaptation at birth.

It is important to acknowledge the limitations of the present study. The first limitation is that the study was done in only one center, in only one hospital, and this limits the generalization of the results to the wider population. The second limitation is that the number of samples was not large enough, as the sample consisted only of 98 patients. The third limitation is that the control group, consisting of adult pregnant women, was not included in the study, and this limits the comparison of the results with teenage and adult pregnant women. The fourth limitation is that the data collected was not complete, as the variables, such as nutritional status, BMI, and ANC attendance, were not included in the data, and this could have given more explanation to the results. The fifth limitation is that the data was collected from the hospital records, and this could have led to the inclusion of incomplete data.

CONCLUSION

The present study has shown that teenage pregnancy is linked with a significantly high incidence of adverse outcomes among pregnant women and neonates, with anemia, premature birth, and low birth weight being the most common complications of teenage pregnancy. Poor socioeconomic status, rural residence, and low educational level are the most common demographic characteristics of teenage pregnant women, which further increases the risk of adverse outcomes.

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