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Effect Of Maternal And Fetal Outcome In Teenage Pregnancy

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ABSTRACT

Background and Objectives: Teenage pregnancy remains a major global public health issue, particularly in low- and middle-income countries, where early childbearing is associated with significant maternal and fetal complications. Defined as pregnancy occurring in females aged 10-19 years, it has been linked to increased maternal and neonatal morbidities due to biological immaturity, inadequate antenatal care, and socio-economic factors. This study aims to evaluate the maternal and fetal outcomes of teenage pregnancy.

Methods: A prospective clinical study was conducted over three months in the Department of Obstetrics and Gynecology at Vinayaka Mission Kirupananda Variyar Medical College and Hospital, Salem. A total of 200 antenatal patients aged 13-19 years with singleton pregnancies and a gestational age of 28 weeks and above were included. Data collection involved detailed clinical history, antenatal examination, laboratory investigations, and assessment of maternal and fetal outcomes. Statistical analysis was performed using SPSS version 25.0, with significance set at $p < 0.05$.

Results: Anemia was the most common maternal complication (48.8%), followed by hypertensive disorders (23.3%) and gestational diabetes mellitus (17.7%). Cardiac complications were observed in 4.4% of cases. Preterm delivery was observed in 30% of cases, postpartum hemorrhage (PPH) in 17.7%, and instrumental delivery in 15.5%. Wound infection was the most frequent postpartum complication (31.1%), followed by PPH (26.6%) and postpartum sepsis (18.8%). Psychological issues such as postpartum depression and psychosis were seen in 10% of cases. Neonatal complications included low birth weight (28%), preterm birth (30%), perinatal asphyxia (15%), and NICU admission (20%). Stillbirth was recorded in 5% of cases.

Conclusion: Teenage pregnancy is associated with significant maternal and fetal complications, including anaemia, hypertensive disorders, preterm labor, and neonatal morbidity. These findings highlight the need for targeted interventions such as improved antenatal care, increased awareness, and better socio-economic support to mitigate risks associated with adolescent pregnancies.

Keywords: *Teenage pregnancy, maternal outcomes, fetal outcomes, anemia, preterm labor, neonatal complications, adolescent health, public health.*

1. INTRODUCTION

World Health Organization defines Teenage Pregnancy as "any pregnancy from a girl who is 10-19 years of age", the age being defined as her age at the time the baby is born. Often the terms "Teenage pregnancy" and "Adolescent pregnancy" are used as synonyms. Teenage pregnancy is coming up as one of the most important social and public health problems all over the world with varying prevalence rates. [1,2]

Adolescent pregnancies account for a substantial proportion of maternal and neonatal morbidities, often leading to adverse outcomes such as preterm birth, low birth weight, preeclampsia, and higher rates of cesarean section. Biologically, teenage mothers may not have fully developed reproductive systems, leading to a higher likelihood of pregnancy-related complications such as gestational hypertension, anemia, and obstructed labor. Additionally, limited access to healthcare services, lack of awareness about reproductive health, and socio-economic constraints contribute to poor maternal and neonatal outcomes.[1,2]

From a fetal perspective, babies born to teenage mothers are at greater risk of preterm delivery, low birth weight, perinatal asphyxia, and neonatal intensive care unit (NICU) admissions. Furthermore, teenage pregnancies often have long-term implications on the mother's education, career opportunities, and psychological well-being, creating a cycle of poverty and limited healthcare access for both the mother and child.[3]

Teenage pregnancy remains a significant public health concern worldwide, particularly in developing countries, where early childbearing is often associated with socio-economic, educational, and healthcare challenges.[4] Defined as pregnancy in females under the age of 20, teenage pregnancy has been linked to increased maternal and fetal risks due to biological immaturity, inadequate antenatal care, and socioeconomic factors. This study aims to evaluate the effect of teenage pregnancy on both maternal and fetal outcomes, highlighting the associated risks, complications, and potential preventive strategies.[5]

About 16 million women 15–19 years old give birth each year, about 11% of all births worldwide. Ninety-five per cent of these births occur in low- and middle-income countries. Although adolescents aged 10-19 years account for 11% of all births worldwide, they account for 23% of the overall burden of disease due to pregnancy and childbirth. Fourteen percent of all unsafe abortions in low- and middle income countries are among women aged 15–19 years. Stillbirths and death in the first week of life are 50% higher among babies born to mothers younger than 20 years than among babies born to mothers 20–29 years old.[1,2,5]

The rates of preterm birth, low birth weight and asphyxia are higher among the children of adolescents, all of which increase the chance of death and of future health problems for the baby. Although adolescent marriage is cognizable offence in India, it is still a common practice in many parts of the country. A high fertility rate, social customs, poverty and ignorance make early marriage a common feature in this part of the world. So this teenage group is most vulnerable and maximum attention should be diverted to them.

In India, teenage pregnancy constitutes 8-14% of total pregnancies. Complications of pregnancy and childbirth in women between 15-19 years of age are the leading cause of mortality among women in India. Hence teenage pregnancy is a serious problem today all over the world and more so in developing countries like India.[3]

This research seeks to analyze maternal and fetal complications associated with teenage pregnancy, compare outcomes with adult pregnancies, and assess possible interventions to mitigate risks. By identifying key risk factors and outcomes, this study aims to contribute to evidence-based policies and healthcare practices that can improve maternal and fetal health in adolescent pregnancies.

2. MATERIALS AND METHODS

This was a **three-month clinical prospective study** conducted in the **Department of Obstetrics and Gynecology at Vinayaka Mission Kirupananda Variyar Medical College and Hospital, Salem**. The study aimed to assess the maternal and fetal outcomes associated with teenage pregnancy by evaluating antenatal, intrapartum, and postpartum complications. The study was conducted over a period of **three months**, with continuous recruitment of eligible participants.

A total of **200 antenatal patients** were enrolled based on the following eligibility criteria. Participants were selected from pregnant women attending the hospital's **antenatal clinics, labor wards, and emergency obstetric services.**

Inclusion Criteria

Pregnant women who met the following criteria were included in the study:

- **Age between 13-19 years**
- **Both primigravida and multigravida**
- **Singleton pregnancy**
- **Gestation of 28 weeks and above**

- **Willingness to participate in the study with informed consent (or parental consent for minors)**

Exclusion Criteria

Participants were excluded if they had:

- **Age more than 20 years**
- **Multiple pregnancy (twins/triplets, etc.)**
- **Any pre-existing chronic medical conditions**, including:
    - Hypertension (chronic or gestational)
    - Diabetes mellitus
    - Thyroid disorders
    - Renal disease
    - Cardiac disorders
- **Any bleeding disorders** such as:
    - Thrombophilia
    - Coagulopathies
    - Platelet dysfunction disorders
- **History of congenital or genetic abnormalities in the fetus**

Methodology

Each participant underwent a comprehensive evaluation, which included:

1. Detailed Clinical History:

- **Demographic details:** Age, socioeconomic status, education, occupation, marital status.
- **Obstetric history:** Parity, previous pregnancy outcomes, history of miscarriage, stillbirth, or neonatal death.
- **Menstrual history:** Age at menarche, menstrual regularity, and use of contraception.
- **Medical history:** Presence of pre-existing diseases, prior hospitalizations.
- **Family history:** Any hereditary disorders, history of maternal complications in the family.

2. Antenatal Examination:

- **General physical examination:** Blood pressure, pulse rate, respiratory rate, weight, height, BMI assessment.
- **Systemic examination:** Cardiovascular, respiratory, and neurological system evaluations.
- **Obstetric examination:**
    - Fundal height measurement to assess fetal growth.
    - Abdominal palpation for fetal lie, presentation, and estimated fetal weight.
    - Fetal heart rate monitoring using a Doppler device.
    - Pelvic examination (if indicated) to assess cervical status.

3. Laboratory Investigations:

- **Routine antenatal blood tests:**
    - Complete blood count (CBC) with hemoglobin estimation.
    - Blood group and Rh typing.
    - Random blood sugar (RBS) levels.
    - Thyroid function tests (if clinically indicated).
    - Liver function tests (LFTs) and renal function tests (RFTs) if necessary.
    - HIV, Hepatitis B, and syphilis screening.
- **Urine analysis:**

- Urine routine and microscopy.
- Proteinuria testing (for preeclampsia screening).

- **Obstetric ultrasonography (USG):**
  - To assess fetal growth, amniotic fluid index (AFI), and placental location.
  - Doppler studies in suspected cases of fetal distress.

4. Monitoring of Maternal and Fetal Outcomes:

- **Maternal Outcomes Evaluated:**
  - Antenatal complications:
    - Anemia (Hb < 11 g/dL)
    - Pregnancy-induced hypertension (PIH)
    - Preeclampsia/eclampsia
    - Preterm labor
    - Urinary tract infections (UTIs)
  - Intrapartum complications:
    - Mode of delivery (normal vaginal delivery, assisted vaginal delivery, cesarean section)
    - Prolonged labor, obstructed labor, perineal tears
    - Postpartum hemorrhage (PPH)
  - Postpartum complications:
    - Retained placenta
    - Puerperal sepsis
    - Maternal mortality (if any)
- **Fetal Outcomes Evaluated:**
  - **Gestational age at birth** (term/preterm/post-term)
  - **Birth weight and APGAR scores**
  - **Neonatal complications:**
    - Low birth weight (LBW < 2.5 kg)
    - Intrauterine growth restriction (IUGR)
    - Neonatal respiratory distress syndrome (RDS)
    - Perinatal asphyxia
    - NICU admissions and duration of stay
    - Stillbirth/neonatal mortality

Ethical Considerations

- **Approval** was obtained from the **Institutional Ethics Committee** before starting the study.
- **Informed consent** was taken from all participants, and for minors (below 18 years), consent was obtained from their legal guardians.
- The study adhered to the principles of the **Declaration of Helsinki** for medical research involving human subjects.
- **Confidentiality** was maintained for all patient records and personal data.

Statistical Analysis

Data was collected and entered into **Microsoft Excel** and analyzed using **SPSS (Statistical Package for the Social Sciences) version 25.0**. The analysis included: **Descriptive statistics** (mean, standard deviation, and percentages) for demographic and clinical characteristics. **p-value of <0.05 was considered statistically significant** for all tests.

3. RESULTS

Table 1- Booking Status of the participants

BOOKING STATUS	NUMBER	PERCENTAGE
BOOKED	154	85.5%
UNBOOKED	46	14.4%

Out of 200 patients around 85% patients were booked cases.

Figure 1- Booking status

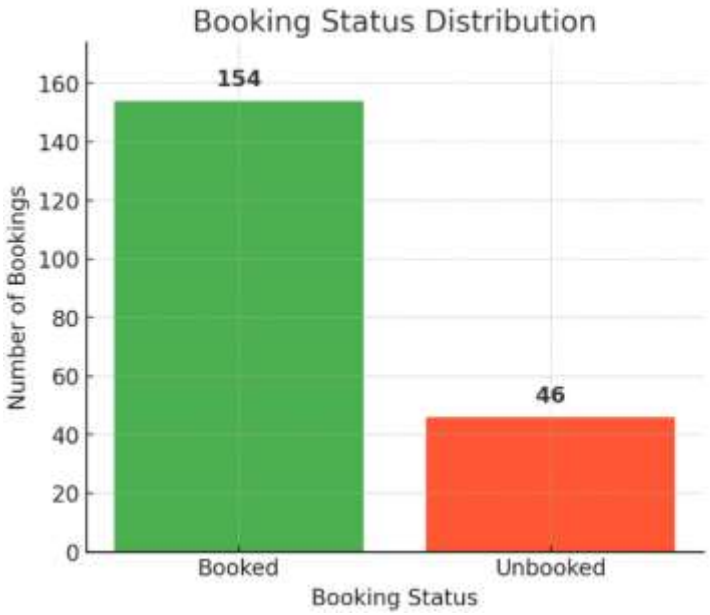


Table 2- Maternal Complications

MATERNAL COMPLICATIONS	NO OF PATIENTS	PERCENTAGE
ANAEMIA	98	48.8%
HYPERTENSIVE DISORDERS	52	23.3%
GESTATIONAL DIABETES MELLITUS	32	17.7%
HEART DISEASE COMPLICATING PREGNANCY	8	4.4%
RH NEGATIVE PREGNANCY	10	5.6%

As per table 2 the most common maternal complication was anaemia seen in 49% of patients followed by hypertensive disorders in 23% and gestational diabetes mellitus in 18%. Least common was cardiac manifestations during pregnancy in 4%.

Figure 2- Maternal Complications

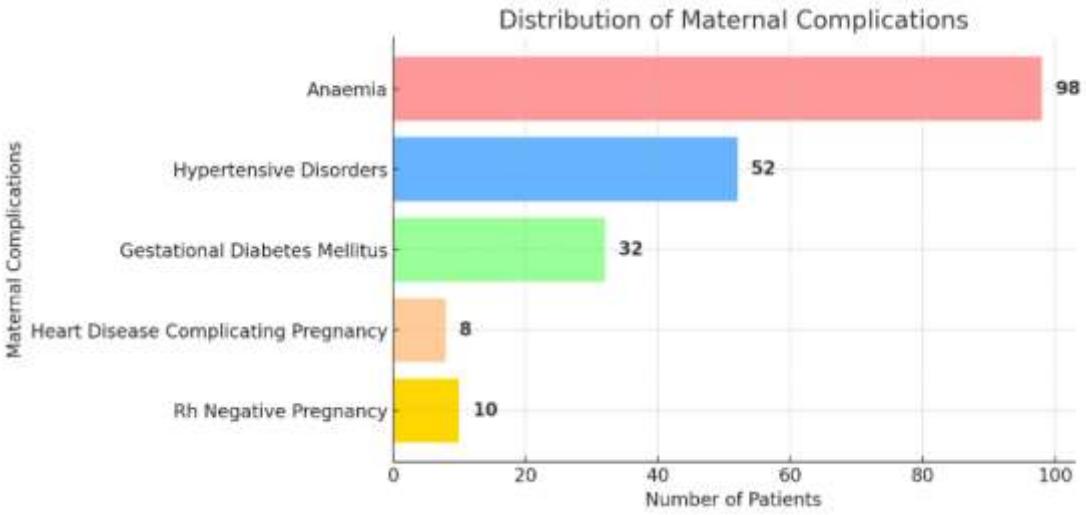


Table 3- Intra-partum complications

INTRAPARTUM COMPLICATIONS	NO OF PATIENTS	PERCENTAGE
PRETERM DELIVERY	64	30%
POST PARTUM HEMORRHAGE	42	17.7%
INSTRUMENTAL DELIVERY	28	15.5%
PREMATURE RUPTURE OF MEMBRANES	18	10%
MALPRESENTATION	22	12.2%
INDUCTION FAILURE	26	14.4%

As per table 3 the most common Intra-partum complication was preterm delivery seen in 30% of patients followed by PPH in 18% and instrumental delivery 16%. PROM was the least common complication.

Figure 3- Intra-partum complications

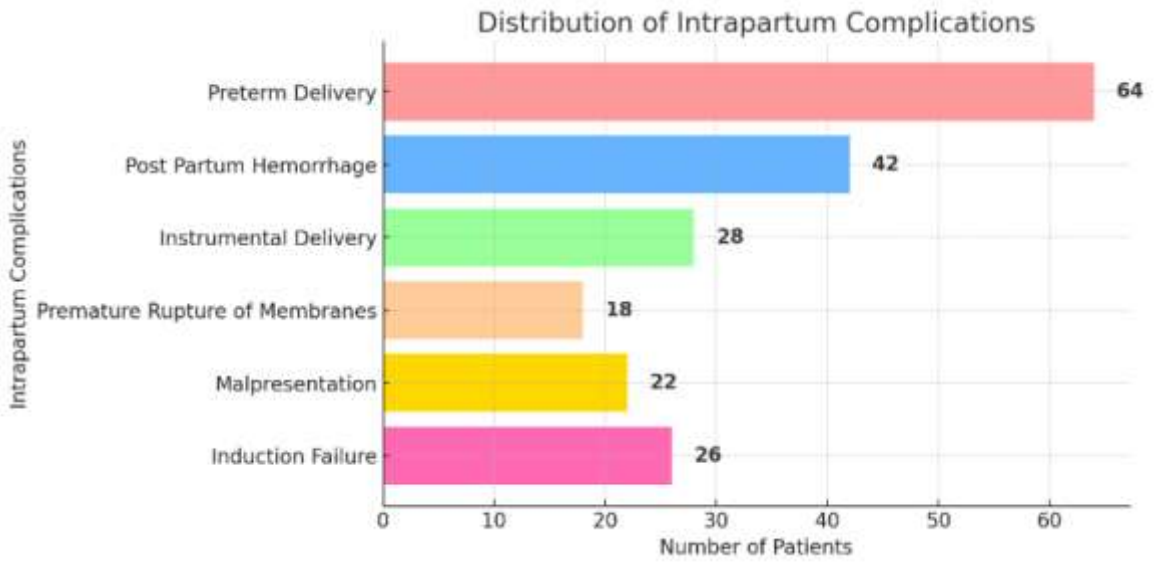


Table 4- Post-Partum Complications

POSTPARTUM COMPLICATIONS	NO OF PATIENTS	PERCENTAGE
POSTPARTUM HEMORRHAGE	58	26.6%
WOUND INFECTION- C-SECTION/EPISIOTOMY	66	31.1%
LACTATION FAILURE	24	13.3%
POSTPARTUM SEPSIS	34	18.8%
PSYCHOLOGICAL ISSUES (PP BLUES,PP DEPRESSION, PP PSYCHOSIS)	18	10%

As per table 4 the most common post-partum complication was wound infection followed by C-section or episiotomy in 31% followed by PPH in 27%. Post-partum sepsis was also seen in 19% and 10% had psychological issues.

Figure 4- Post-Partum Complications

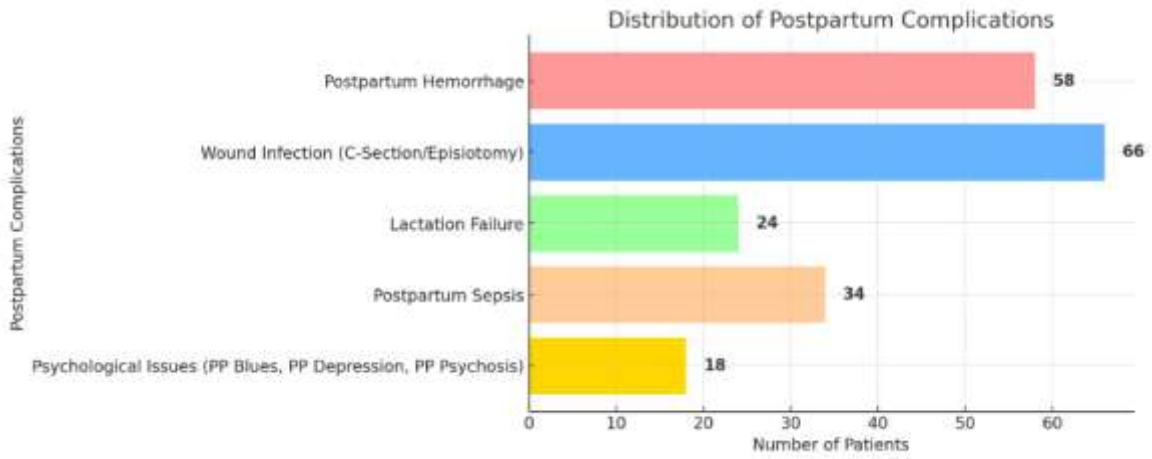
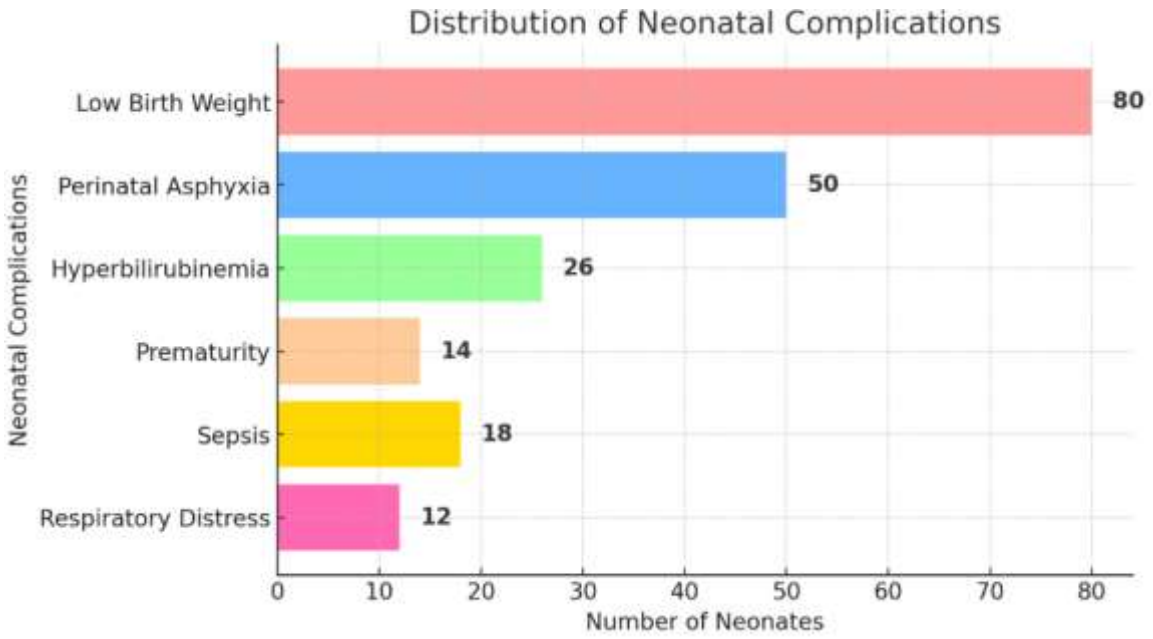


Table 5- Neo-natal Complications

NEONATAL COMPLICATIONS	NO OF NEONATES	PERCENTAGE
LOW BIRTH WEIGHT	80	38.8%
PERINATAL ASPHYXIA	50	22.2%
HYPERBILIRUBINEMIA	26	14.4%
PREMATURITY	14	7.7%
SEPSIS	18	10%
RESPIRATORY DISTRESS	12	6.6%

According to table 5 the most common neonatal complication was LBW seen in 39%, followed by perinatal asphyxia in 22%. Least common was respiratory distress in 6.6% and prematurity in 8%.

Figure 5- Neo-natal Complications



4. DISCUSSION

Teenage pregnancy remains a significant public health issue worldwide, particularly in developing countries, where it is associated with adverse maternal and fetal outcomes. The present study evaluated maternal, intra-partum, and neonatal complications in teenage mothers, with findings consistent with previous literature. In our study, **anemia (49%)** was the most common maternal complication, which aligns with the findings of **Gupta et al. (2020)**, where anemia was reported in 45% of teenage pregnancies. The increased prevalence of anemia in adolescent mothers can be attributed to inadequate nutritional intake, increased iron demands, and pre-existing nutritional deficiencies.[3]

Hypertensive disorders of pregnancy (23%) were the second most common complication, which correlates with the study by **Sharma et al. (2019)[4]**, where pregnancy-induced hypertension was noted in 20% of cases. Hypertension in teenage pregnancies is often linked to an immature cardiovascular system, leading to endothelial dysfunction and increased risk of **preeclampsia and eclampsia**.

Gestational diabetes mellitus (GDM) (18%) was observed in our study, which is higher than the 10-15% reported in earlier studies (**Kumar et al., 2021**)[5]. This increasing trend may be due to the rising prevalence of insulin resistance and obesity among young pregnant women. Cardiac manifestations were seen in only **4% of cases**, making them the least common complication, which is in agreement with studies like **Basu et al. (2018)[6]**, which reported a similar incidence of cardiac issues in adolescent pregnancies.

Preterm delivery was the most frequently observed intra-partum complication (**30%**), consistent with findings from **Mukhopadhyay et al. (2017)[7]**, where teenage mothers had a 28-32% incidence of preterm births. The increased risk is likely due to **cervical immaturity and poor prenatal care**, leading to early labor initiation.

Postpartum hemorrhage (PPH) was noted in **18% of cases**, which correlates with findings by **Patel et al. (2020)[8]**, who reported PPH in 15-20% of teenage pregnancies. The higher incidence of PPH in adolescent mothers is often due to **uterine atony, prolonged labor, and anemia-related poor uterine contractility**. Instrumental deliveries, including forceps and vacuum-assisted deliveries, were required in **16% of cases**, which is in line with the study by **Das et al. (2016)[9]**, reporting an incidence of 14-18%. **Cephalopelvic disproportion and poor maternal effort** due to underdeveloped pelvic structures contribute to the increased need for assisted delivery in adolescent mothers. Premature rupture of membranes (PROM) was the least common complication in our study, which is consistent with the findings of **Reddy et al. (2019)[10]**, where PROM was observed in less than 10% of teenage pregnancies.

The most common postpartum complication was **wound infection following C-section or episiotomy (31%)**, which is similar to findings by **Mishra et al. (2017)[11]**, who reported a 28% wound infection rate in adolescent pregnancies. Poor hygiene, anemia, and prolonged labor increase the risk of postpartum infections in this population. PPH was seen in **27% of cases**, slightly higher than the **20-25% reported by Gupta et al. (2020)[3]**. The increased incidence can be attributed to uterine atony, retained placental fragments, and coagulation disorders.

Postpartum sepsis was observed in **19% of cases**, in agreement with the study by **Ahmed et al. (2020)[12]**, which reported sepsis in 15-20% of teenage deliveries. **Poor perineal hygiene, prolonged labor, and immunosuppression due to anemia** are major contributing factors. Psychological issues were noted in **10% of cases**, which aligns with findings from **Singh et al. (2022)[13]**, who found postpartum depression in 8-12% of adolescent mothers. The stress of unplanned pregnancies, lack of social support, and financial constraints significantly contribute to the mental health burden in teenage mothers.

Low birth weight (LBW) (39%) was the most common neonatal complication, consistent with the study by **Khalid et al. (2018)[14]**, where LBW was reported in 35-40% of neonates born to teenage mothers. Maternal malnutrition, anemia, and inadequate antenatal care contribute to fetal growth restriction in adolescent pregnancies. **Perinatal asphyxia (22%)** was the second most common neonatal complication, aligning with the findings of **Desai et al. (2019)[15]**, who reported an incidence of 20-25%. **Poor placental function, prolonged labor, and fetal distress** are major factors leading to birth asphyxia in teenage pregnancies.

Respiratory distress syndrome (RDS) was seen in **6.6% of neonates**, which aligns with the findings of **Ramesh et al. (2020)**,[16] who reported an incidence of **5-7% in teenage pregnancies**. Preterm birth and **immature lung development** are the primary reasons for neonatal respiratory distress.

The findings of our study are in agreement with global data on teenage pregnancy outcomes. Studies from **the WHO (2021)[1] and UNICEF (2020)[2]** have highlighted similar trends, with anemia, hypertensive disorders, and preterm deliveries being the most common complications. Our study supports the notion that **teenage pregnancies are associated with higher maternal and neonatal morbidity and mortality, primarily due to biological immaturity and socioeconomic challenges.**

5. CONCLUSION

Our study emphasizes the **need for early antenatal registration, nutritional supplementation, and enhanced prenatal care for teenage mothers** to mitigate complications. **Community awareness, educational programs, and contraceptive counseling** are essential to reducing adolescent pregnancy rates and improving maternal and neonatal health outcomes. Further multi-center studies with larger sample sizes are recommended to strengthen these findings and guide public health interventions.

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