Original Research Article

High risk pregnancies - The maternal and fetal outcomes in a tertiary care unit

Kovvuru Ashrita[1], Kalvakunta Sarvagnya[2*]

[1,2]MBBS 3rd year, Osmania Medical College, Koti, Hyderabad, Telangana, India
[*]Corresponding author email: **sarvagnya2800@gmail.com**

Abstract

Background: High risk pregnancies have been a major obstetric issue particularly in the era of modern development. This is because of the subjective, objective, social and economic factors. Early intervention would prevent the maternal mortality and morbidity as well as the unfavorable fetal outcomes.

Aim and objectives: To assess the prevalence of high-risk pregnancies, to evaluate the socio-demographic factors and obstetric index associated with the risks in pregnancy, to associate high risk pregnancies with the maternal and fetal outcomes.

Materials and methods: A record based retrospective study was done at Modern Government Maternity Hospital (MGMH), Petlaburj, Hyderabad. This study was done by reviewing the records for the details of pregnant women diagnosed with medical disorders, available over a period of three months (April 2019 to June 2019). The details of the subjects were entered in the case sheet proforma and the analysis was done using Microsoft excel 2017 and epi info 7.0.

Results: Among the socio-demographic factors and obstetric indices, gravida, parity and socio-economic status were found to be significant factors. Hypertension was the most occurring disorder among the 1176 cases. The frequency of younger primi and elder gravida was found to be next to hypertensiom. Secondly, most of the deliveries were term deliveries (79.4%), pre term deliveries being 18.6% and post term deliveries were 2%. 51.3% deliveries were vaginal deliveries and emergency LSCS were 6.5%. 1 in 3 were low birth weights and 5.4% were intra uterine deaths.

Conclusion: The complications and threat to the health of the mother and fetus are immense during pregnancies particularly associated with medical disorders. Most factors pertaining to risks in pregnancy are preventable. Of particular concern, is the delay in diagnosis. The role of each medical professional in antenatal care is crucial.

Key words

High risk pregnancy, Hypertension, younger primi and elderly gravida, Preterm deliveries, low birth weight.

Introduction

Pregnancy is a state of physiological adaptations which may sometimes turn detrimental to the health of the mother and the newborn. Maternal disorders are the ones which complicate the health status of the mother and the neonate [1]. Childbirth sometimes leaves a woman with severe physical or psychological damage [2]. Pre pregnancy life style, proper adolescent nutrition, menstrual hygiene are the basic factors to prevent the medical disorders in pregnancy [3]. These are the major parameters which serve health consequences to both mother and child [4].

According to the World Health Organization about 800 women die of pregnancy-related preventable causes daily, and 99% of these deaths occur in developing countries. The global prevalence of high-risk pregnancies has been reported to be 20%, also 50 percent of perinatal mortality is because of high-risk pregnancy [5].

Early identification, rapid assessment, follow-up care, appropriate laboratory investigations and referral services are required to improve the outcome of pregnancy [1].

Materials and methods

A record based retrospective study was done on pregnant women registered at Modern Government Maternity Hospital, Petlaburj, Hyderabad, Telangana, India. This study was done by reviewing the records for the details of pregnant women diagnosed with medical disorders, available over a period of three months, April 2019 to June 2019. The details of the subjects were entered in the case sheet proforma and the analysis was done using Microsoft excel 2017 and epiinfo 7.0.

Study design: Cross-Sectional
Study type: Observational

Place of study: Modern Government Maternity Hospital, Petlaburj, Hyderabad, Telangana, India.
Sample size: 1176
Subjects and selection method: The subjects with high risk pregnancies were short listed from all the pregnant women registered at Modern Government Maternity Hospital keeping in view the inclusion and exclusion criteria.

The criteria considered for the evaluation of high-risk pregnancies were defined as per the guidelines provided by Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) [6].

a. Severe anemia with hemoglobin level <7 g/dl
b. Hypertensive disorder in pregnancy (blood pressure >140/90 mmHg)
c. Pregnant women positive for HIV/syphilis
d. Hypothyroidism (thyroid-stimulating hormone values – first trimester: 0.1–2.5 mIU/L, second trimester: 0.2–3 mIU/L, and third trimester: 0.3–3 mIU/L)
e. Gestational diabetes mellitus (glucose challenge test ≥140 mg/dl)
f. Twin pregnancy or multiple pregnancy
g. Younger primi (age <20 years) or elderly gravida (age >35 years)
h. Malpresentation
i. Rh incompatibility
j. Low-lying placenta or placenta previa.

Outcome of pregnancy was categorized as follows
Obstetric outcome
- Type of delivery – preterm (<37 weeks of pregnancy), term (37–42 weeks of pregnancy), and post-term delivery (>42 weeks of pregnancy)
- Mode of delivery – vaginal delivery, elective lower segment caesarean section and emergency lower segment caesarean section.

Neonatal outcome

- Birth weight of child – low-birth weight baby (birth weight <2.5 kg), normal baby (birth weight ≥2.5 kg)
- Status of birth – live birth, stillbirth.

Inclusion criteria
- Pregnant women with high risk pregnancies who were registered at Modern Government Maternity Hospital, Petlaburj, Hyderabad.

Exclusion criteria
- Records with incomplete details

Procedure methodology
After obtaining permission from the ethical committee, records of Elective Lower Segment Cesarean Sections, Emergency Lower Segment Caesarean Sections and Vaginal deliveries available over a period of three months i.e. April 2019 to June 2019 were reviewed. The data was entered in a self-prepared and ethical committee approved case sheet proforma.

Considering the inclusion and exclusion criteria, samples were selected and the following details were taken into account:

Identification data: Name, age, address, socio-economic status and contact details.

The obstetric history: The obstetric formula, details of the previous pregnancies (if any) and the type of high-risk pregnancies.

The maternal outcomes that are the type of delivery and mode of delivery were noted. Birth weight and status of birth constituting the Neonatal outcomes were recorded.

Statistical analysis
The data was analyzed using Microsoft excel 2017, and epiinfo 7.0.

Results

The study was conducted at Modern Government Maternity Hospital, Petlaburj in the months of April 2019 to June 2019. The total number of high-risk pregnancies recorded in this span of 3 months was 1198. 22 of these cases were excluded as they were with incomplete details.

Hence 1176 cases were involved in the final analysis of the study. The prevalence of high-risk pregnancies was 25.9%.

The mean age of the population was 24.220 (Standard Deviation = 4.36) out of which 42 (3.6%) were adolescent pregnancies and 48(4%) were elderly gravida (**Table – 1**).

Table - 1: Socio demographic factors and Obstetric Indices.

Age category (years), n=1176	Frequency, *n* (%)
<20	42(3.6%)
20-25	778(66.2%)
26-30	260(22.2%)
31-35	48(4%)
36-40	48(4%)
Socioeconomic status, n=1176	**Frequency, *n* (%)**
Below poverty line	995(84.6%)
Above poverty line	181(15.4%)
Gravida, n=1176	**Frequency, *n* (%)**
Primi	473(40.2%)
Multi(2 or more pregnancy)	703(59.8%)
Parity, n=1176	**Frequency, *n* (%)**
Nulliparous	502(42.6%)
Multiparous (parity-1,2,3 and 4)	674(57.4%)
No. of living child, n=1176	**Frequency, *n* (%)**
0	525(44.6%)
1	464(39.4%)
2	145(12.3%
3	38(3.2%)
4	4(0.5%)
Abortion, n=1176	**Frequency, *n* (%)**
0	1053(89.5%)
1	89(7.5%)
2	34(3%)
Booked/ Unbooked	**Frequency, n (%)**
Booked case	683(58%)
Unbooked Case	493(42%)

Among the socio demographic and obstetric factors associated with high risk pregnancies, we found gravida, parity and socio-economic status to be significant (p values being less than 0.05). Other factors like booked and unbooked cases

were not found to be significant as their p values were more than 0.05 (**Table – 2**).

Table – 2: Socio-demographic factors and obstetric indices associated with high-risk pregnancies.

Factors	No. (%) of women	p Value
Socioeconomic status		
Below Poverty Line	995(84.6%)	0.02
Above Poverty line	181(15.4%)	
Gravida		
Primi	473(40.2%)	0.003
Multi	703(59.8%)	
Parity		
Nulliparous	502(42.6%)	0.004
Multiparous	674(57.4%)	
Booked/ unbooked		
Booked	683(58%)	0.36
Unbooked	493(42%)	

Hypertension was the most occurring disorders according to our study. 624 (53.1%) were hypertensive cases out of which 36.1% were the cases of gestational hypertension, 49.5% of the cases were that of pre-eclampsia and 14.4% of them progressed to eclampsia complicating pregnancies (**Figure – 1**). The frequency of Younger primi and elderly gravida (n=396) was found next to the number of hypertension cases. Hypothyroidism was the next common with 147 cases (12.5%). There were almost equal number of cases of moderate anemia (n=68) and severe anemia (n=75). Other disorders like Koch's positive cases, chicken pox, thrombocytopenia, gastroenteritis complicating pregnancy and neurofibromatosis together constituted 5.3% (n=63).

The maternal outcomes of the high-risk cases were evaluated based on the type of delivery and the mode of delivery. There were 9 cases of maternal mortality in the study period of 3 months. 6 of these cases were attributed to hypertensive disorder in pregnancy. Post-partum hemorrhage was the cause of 2 deaths and 1 was because of jaundice (**Table – 3**).

The inference from **Table - 4** is that almost 1out of every 3 new born had a low birth weight. The mean birth weight was found to be 2.6 kg with a standard deviation of 0.58.

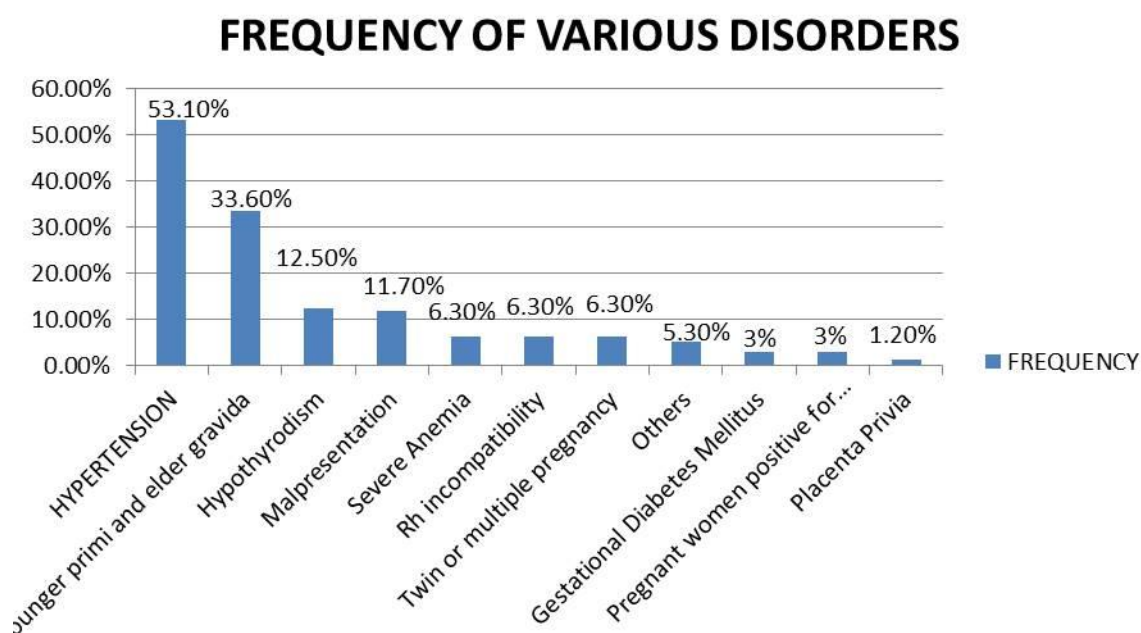**Figure - 1:** Prevalence of high-risk pregnancies.

Table - 3: Maternal outcomes.

Obstetric outcome	Frequency, n (%)
Type of delivery, n=1176	
Pre-term (<37 weeks)	929(79%)
Term (37-42 weeks)	223(19%)
Post-Term (>42 weeks)	24(2%)
Mode of delivery, n=1176	
Vaginal delivery	600(51%)
Elective Lower Segment Caesarean Section	82(7%)
Emergency Lower Segment Caesarean Section	494(42%)

Table - 4: Fetal outcomes.

Fetal outcome	Frequency, n (%)
Birth weight of baby, n=1176	
Low birth weight (<2.5 kg)	364(31%)
Normal birth weight (>/= 2.5 kg)	812(69%)
Status of birth, n=1176	
Live birth	1113(94.6%)
Still birth	63(5.4%)

Discussion

In the present study, 11.6% of the study population was in extreme age groups (younger primi and elderly gravida). In studies done in other parts of India like Karnataka, 88% are in the age 20 to 29 years, followed by 30 years. In Uttar Pradesh, 29.95% are in extremes of age group [7]. This shows that the findings in different parts of India are almost similar whereas, in another study conducted in Egypt majority (44%) is in the age between 30-35 years [8]. In a study in Saudi Arabia, history of previous pregnancy complications is 67.4% of the cases of high-risk pregnancies. These problems included the 65.4% high parity, 12% abortion, 5.8% the previous cesarean section, 4.8% mother with negative RH, 4.5% young nullipara mother. In Iran, only 20% of the high-risk cases are multiparous whereas, 57.4% of the cases were multiparous in our study. A study in Iran portrays that history of abortion is found significant in high risk group (P = 0.02) [9].

There are many studies which focused on the medical disorders in pregnancy, but very few studies were done which correlated them with the maternal and neonatal outcomes. Hence, this study was done to determine the prevalence and outcomes. According to WHO, the prevalence of high-risk pregnancy varies from country to country, for example, in north of India is 31.4%, Nigeria, 40.1% and Tunisia, 59.3% [10]. It was 25.9% in the present study. In synchrony with the present study, studies done in Egypt assessed 63.8% of the pregnancies to be high risk pregnancies [11]. Another study in Egypt shows that 3 risk factors had the highest prevalence which was: age at least 35 years old, parity five and more, anemia. In various parts of India like Pondicherry studies reveal that most of the disorders in pregnancy are accounted by hypertension. This prevalence is comparable with the prevalence reported from a study done in Nigerian teaching Hospital, which is significantly higher than the findings of the study done in Yekatit Hospital, Addis Ababa, Ethiopia [12]. The findings in other countries like Australia has asthma dominance, while in Nigeria, malaria complicating pregnancies were common. It is known that prevalence of anemia in pregnancy is 42% worldwide, the lowest being 6% in North

America and the highest is 75% in Gambia [13]. The prevalence of anemia in pregnancy is 25.1% in Europe, and around 24.1% in America [14] whereas in our study, it was found to be 13%.

Studies conducted in Nagpur revealed similar maternal outcomes as our study. According to a study done in Dhaka, among 206 study population 60.19% high risk pregnant women are at term at the time of delivery and 39.8% women delivered their babies preterm, whereas in our study, 79% deliveries were preterm and 19% were term deliveries. Cesarean section is done in 69.41% of high-risk pregnant women while it was 49% in our study. In Nagpur, 33.49% neonates have low birth weight and 39.80% have premature births [15]. In Sharmi and his partners' study, in terms of delivery type (normal/ cesarean section), premature birth and infant mortality rates, there is a significant difference between the high risk and low risk groups, it means (the complications were more in the high risk group). While in terms of the variables of low birth weight fetal death, there is no significant difference between the two groups [16].

Fetal outcomes are not very significant in most of the studies [17]. However, in Karachi there are 7.40% stillbirths, which is in synchrony with our study having 5.4% still births while there is 1 (0.84%) stillbirth and no neonatal death in low risk group (p=0.004). There were 58 (35.80%) neonates with low birth weight in high-risk group, against 31% in the current study while the same were only 4 (3.33%) in low risk group, which was statistically significant (p=0.001, RR=1.98) [18]. In Chaman and his partners' study, delivery type and birth weight shows a significant statistical association with neonate mortality. But pregnancy age, mother and father literacy don't have a significant statistical association [19].

Conclusion

Major backbone of this study is the use of standard guidelines to classify the disorders in pregnancy, which would help to authentically compare them with the studies done in other parts of the world. The outcome for a particular pregnancy will depend on the type of the disorder, the severity and progression of the disorder and the quality of obstetric and medical management. This study portrays that the major complications and unfavorable outcomes are associated with high risk pregnancies.

Acknowledgement

References

1. Managing Complications in Pregnancy and Childbirth: A Guide for Midwives and Doctors. 2nd edition, Geneva: World Health Organization; 2017.
2. World Health Organization 10 Facts on Maternal Health. World Health Organization. [Last accessed on 2018 Apr 24].
3. Firozi S. The rate of the prevalence of high-risk pregnancy and the results on pregnant mothers and the effect on parameters after the birth. IJPSR, 2012; 3(10): 3735-41.
4. Paudel IS, Singh SP, Jha N, Vaishya A, Mishra RN. High risk pregnancy and its correlates among the women of eastern Nepal. Indian J Prev Soc Med., 2008; 39: 3-4.
5. Chou D, Inoue M, Mathers C, Moller A, Oestergaard M, Say L, et al. Trends in maternal mortality: 1990 to 2010. WHO UNICEF UNFPA and the World Bank estimates, 2012.
6. Majella MG, Sarveswaran G, Krishnamoorthy Y, Sivaranjini K, Arikrishnan K, Kumar SG. A

longitudinal study on high risk pregnancy and its outcome among antenatal women attending rural primary health centre in Puducherry, South India. J Educ Health Promot., 2019; 8: 12.

7. Singh R, Chauhan R, Nandan D, Singh H, Gupta HC, Bhatnagar M. Morbidity profile of women during pregnancy; A hospital record based study in western UP. International Jornal of community health, 2012; 24(4).

8. Samar KH, Dorgham LS, Suheir AM. Profile of High Risk Pregnancy among Saudi Women in Taif KSA. World Journal of Medical Sciences, 2014; 11(1): 90-7.

9. Elham Kashani, Amin Hassanzad, Mohaddeseh Arab Ameri. The Rate Of The Prevalence Of High-Risk Pregnancies And The Results On Pregnant Mothers And The Effect On Parameters After The Birth. Advances in Environmental Biology, 2012; 6(3): 1319-1324.

10. Freshteh farajnezhad, Faramarz Shaahmadi, Zahra Fashi, Laila Daaylar. Prevalence of high risk pregnancy and some relevant factors in referred women to health centres. Journal of scientific achievements, 2017; 2(12): 4-7.

11. Yassin, S.A., Gamal, A. El-Deen, M.A. Emam, A.K. Omer. The profile of high-risk pregnancy in El-Mansoura city. J. Egypt public Health Assoc., 2005; 80(5-6): 687-706.

12. Jaideep KC, Prashant D, Girija A. Prevalence of high risk among pregnant women attending antenatal clinic in rural field practice area of Jawaharlal Nehru Medical College, Belgavi, Karnataka, India. Int J Community Med Public Health, 2017; 4: 1257-9.

13. Chaman R, Naieni KH, Golestan B, Nabavizadeh H, Yunesian M. Neonatal mortality risk factors in a rural part of Iran: a nested case-control study. Iranian Journal of Public Health, 2009; 38(1): 48-52.

14. Azizi A. The prevalence of the causes of high-risk pregnancies in pregnant women of Sonqor city, 2011. Iranian Journal of Obstetrics, Gynecology and Infertility, 2015; 18(153): 10-9.

15. Shapla NR, Islam MA, Shahida SM, Parveen Z, Lipe YS. Maternal and foetal outcome of 206 high risk pregnancy cases in border guard hospital, dhaka. Mymensingh Med J., 2015 Apr; 24(2): 366-72.

16. Sharmi S.H., Z. Zahiri, F. Myrblok, F.A. Faraji, A. Sobhani. The prenatal outcomes in high-risk pregnancy according to Biophysical profile scoring without Non stress test. Journal of Gilan University of Medical Sciences, 2004; 17(68): 27-33.

17. Jadhao AR, Gawade MD, Ughade SN. Outcome of pregnancy among high risk pregnancies in rural area of Nagpur, Maharashtra, Central India. Int J Community Med Public Health, 2017; 4: 628–33.

18. Zareen N, Naqvi S, Majid N, Fatima H. Perinatal outcome in high risk pregnancies. J Coll Physicians Surg Pak., 2009 Jul; 19(7): 432-5.

19. Chaman R.M., M. Yunesian, B. Golestan, K. Holakouee Naini. Effect of high-risk pregnancies on infant mortality using a case - control method in a sample from rural population. Iranian journal of Epidemiology, 2007; 3(4): 1-6.