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Original Research Article

Prospective study of high-risk pregnancy and their outcome in tertiary care center

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ABSTRACT

Background: Women form the centre of the family and their health is of prime importance to the well-being of the whole family. MCH status is assessed through measurements of mortality, morbidity, growth and development. The term "high risk pregnancy (HRP)" refers to any pregnancy associated with an increased risk for adverse outcomes which can be maternal or fetal.
Methods: It was a prospective observational study conducted on all pregnant women admitted to labour ward in study period from 1st October 2018 to 30th September 2020.
Results: In our study out of 17101 mothers admitted in the labour ward over 56.2 % belong to low-risk group, 25.5% to the moderate and 18.3% belong to high-risk group. Majority of patients belong the age group of 20- 24 years (56.6%) and 78.84% were primipara. Registered patients 98.4% whereas unregistered admissions were 1.6%. 92.95% of admissions were ≥37 weeks gestational age. The mode of delivery for 58.1% of the patients was vaginal deliveries whereas 41.9% delivered through LSCS. 95.10% of women had their babies with them after delivery while NICU admissions were 23.79%. Preterm admissions were seen maximum in high-risk group (26.67%) 52.5% of the patients belonging to the high-risk group were delivered by LSCS, among them 21.59% babies required NICU admission and neonatal death (3.50%) was also higher.
Conclusions: Early detection of high-risk pregnancies at PHC level with proper ANC and referral system improves fetomaternal outcome.

Keywords: ANC, HRP, LSCS, MCH, PHC

INTRODUCTION

The term high risk pregnancy is used by health care providers to demarcate a pregnancy in which a mother, her foetus or both are at higher risk of developing complications during pregnancy or child birth than in a normal pregnancy. Women with high-risk pregnancies should receive care from a special team of health care providers to ensure the best possible outcomes. The maternal and perinatal mortality reflects the quality of health of a community. Perinatal mortality is the best indicator to measure the quality of maternal and child health (MCH) care in the community The high perinatal mortality in India reflects the composite effect of malnutrition, infection and high fertility. The lack of adequate obstetric care and poor transportation in rural settings further aggravates this problem. ANC is also an opportunity to promote the use of skilled attendance at birth and healthy behaviors such as breastfeeding, early postnatal care, and planning for optimal pregnancy spacing.[1]

Pradhan Mantri Surakshit Matriva Abhiyan is an initiative of Ministry of Health and Family Welfare Government of India to identify high risk pregnancies early and follow them so that they can be referred to health care centers with proper facilities so that women with high-risk pregnancies may have healthy pregnancies and deliveries without complications.[2]

As per SDG target 3.1, by 2030 no country should have an MMR higher than 140 deaths per 100000 live births (twice the global target). Country targets for 2030 depend on baseline levels of MMR, to increase equity in maternal mortality.[3] The prenatal high-risk scoring form (PHRS) is a short assessment tool that is completed by medical professionals typically on the first visit and then again at 36 weeks gestation. The interpretation of the scale should always be used in conjunction with good clinical judgement.[4] The antepartum fetal risk scale uses a simple scoring technique to identify infants at risk for later complications.[5] The authors indicate that the scale should be utilised as an additional tool for physicians when working with high-risk pregnant women.

METHODS

It was a prospective observational type of study which was conducted on all the women in the study period from 1st October 2018 to 30th September 2020 in Dr. VMGMC Solapur, Maharashtra, India.

All the women (17101) admitted in labour ward above 28 weeks gestation were considered as sampling unit, both mother and baby were followed upto 7 days after delivery, excluding mothers delivered outside and admitted in wards for the purpose of baby being admitted in NICU, mothers with congenital anomalous babies due to the already pre-determined poor prognosis of the baby and those who took discharge against medical advice. Different scores were assigned to various factors like age, parity, past obstetric history, associated medical factors and relevant present pregnancy factors based on modified prenatal scoring system developed by Das and Datta, which itself is a modification of high-risk scoring system proposed by Coopland et al in Manitoba in 1977.

Table 1: Modified Das and Datta scoring.

Reproductive history factors	Score	Associated disease factors	Score	Present pregnancy	Score
Age		DM	-3	**Bleeding**	
<16 years	-1				
16-30 years	-0	Cardiac diseases	-3	<20 weeks	-1
>30 years	-2	Chronic renal disease	-2	>20 weeks	-3
Parity		**Previous gynecological surgeries**		**Anemia**	
0	-0				
1-3	-1	Ectopic	-1-2	<10 gm%	-2
>3	-2	Metroplasty	-1	<6 gm%	-3
Past obstetric history		Fibroids	-3	**Hypertension**	-2
1.Abortion/infertility	-1	Ovarian tumors	-1	**Oedema**	-3
2.Baby >4 kg	-1	Infective hepatitis	-1	**Albuminuria**	-3
Baby<2.5 kg	-1	Pulmonary TB	-2	**Multiple pregnancy**	-3
3.Hypertension	-1	Undernutrition	-2	**Breech**	-3
4.Previous LSCS	-2	Other disease	-1-3	**Rh-isoimmunisation**	-2
5.Still birth/Neonatal death	-3	**Thyroid problems**		**Prolonged pregnancy**	-1
6.Inversion of uterus	-1	Primi	-1	**PROM**	-2
Reposition of uterus	-2	BOH	-3	**Polyhydramnios**	-2
7.Surgical management of pph		Epilepsy	-1	**Small for dates**	-1
Blynch suture	-1	HBsAg	-3		
Uterine artery ligation	-2	HIV			
Internal iliac ligation	-3	CD4>500	-1		
8.Retained placenta		CD4<500	-3		
Simple	-1				
Morbid	-2				
9.Blood transfusion history					
1 pint	-1				
2 pint	-2				
>2 pint and products	-3				

Statistical tool used to analyse the data was SPSS version 21 (IBM Corp., Armonk, New York, USA).

Based on this scoring system patients are classified into 3 risk groups: low risk- 0-2; moderate risk- 3-5; high risk- 6 and above. Total score-80.

RESULTS

Majority of the patient belong to the age group 20-25 years (56.6%) primi para (78.84%) contributed to the majority of admissions; registered patients were 98.4% whereas unregistered admissions were 1.6%. Majority of admissions were from rural (59.9%). Lower middle class (48.3%) contributed to majority of cases. 92.95% admissions were ≥ 37weeks gestational age. The mode of delivery for 58.1% of patients is vaginal delivery whereas 41.9% delivered by caesarean section. 95.10% of women had their babies with them after delivery while NICU admissions were 23.79%. Jaundice was the common cause of NICU admission in all the groups followed by low birth weight and RDS. Maternal mortality rate of low-risk group was 0.1 per 1000 total births, moderate risk group was 2 per 1000 total births, high risk group was 13 per 1000 total births. Perinatal mortality rate of low-risk group was 3 per 1000 total births. Moderate risk group was 30 per 1000 total births. High risk group was 172 per 1000 total births.

Table 2: Distribution of age among study participants (n=17,101).

Age (years)	Frequency	Percentage
≤19	1710	10.0
20-24	9672	56.6
25-29	4332	25.3
30-34	1126	6.6
≥35	261	1.5

The mean age of the total 17,101 study participants was 23.52±3.7 years. Most of the women belonged to the age group of 20 to 24 years (56.6%) followed by 25 to 29 years (25.3%). Only 1.5% of mothers were aged more than 35 years while 10% were aged less than 19 years.

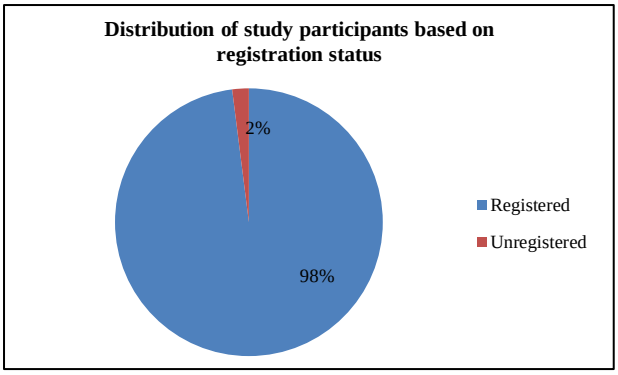

Figure 1: Distribution of study participants based on registration status (n=17,101).

In the present study majority mothers had registered their pregnancy (98.4%). Only 1.6% had not registered.

Majority of study participants were parity 1 (78.84%) followed by parity 2 (16.13%) and 3 (3.93%). Around 1% belonged to parity of 4 and higher order (Table 3).

Table 3: Distribution of parity among study participants (n=17,101).

Parity	Frequency	Percentage
P1	13484	78.84
P2	2757	16.13
P3	671	3.93
>P4	189	1.10

Table 4: Distribution of study participants based on gestational age (n=17,101).

Gestational age (weeks)	Frequency	Percentage
28-32	575	3.36
32-36	633	3.70
≥37	15893	92.95

Most of the mothers had completed 37 weeks of their pregnancy (93%). Around 4% and 3% had their delivery between the gestational week 32-36 and 28-32 weeks respectively.

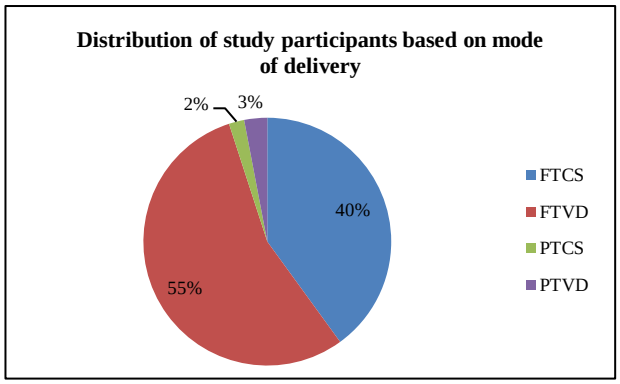

Figure 2: Distribution of study participants based on mode of delivery (n=17,101).

In our study 94.8% had full tern delivery, of which 54.7% and 40.1% had vaginal delivery and cesarian section respectively. 5.2% mothers had post term delivery of which 3.4% was vaginal delivery and 1.8% was by cesarian section respectively.

Table 5: Distribution of study participants based on the outcome of baby (n=17,426).

Baby outcomes	Frequency	Percentage
Healthy baby	16577	95.10
NICU admission	4146	23.79
Intrauterine death	549	3.15
Neonatal death	385	2.20
Total foetal loss	934	5.35

Out of 17, 287 babies delivered, 95% babies were healthy. Around 24% babies needed NICU admission. In the present study 3.15% were intrauterine death and 2.2% were neonatal death, with a total 5.4% foetal loss. The

perinatal mortality in the present study was 54 per 1000 total birth.

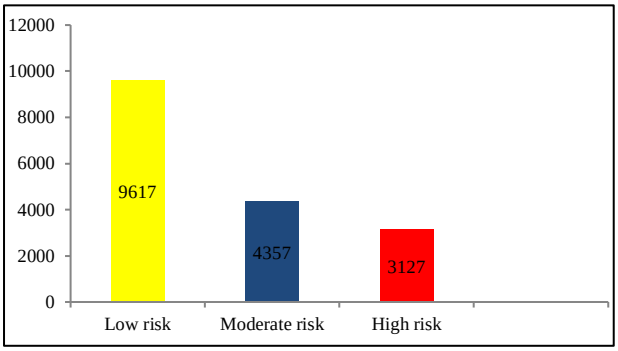

Figure 3: Distribution of study participants based on the risk score (n=17,101).

On classifying the study participants based on the risk score, it was found that 56.2% of mothers belonged to the low-risk category. 25.5% and 18.3% of mothers were categorized has having moderate and high-risk pregnancy respectively.

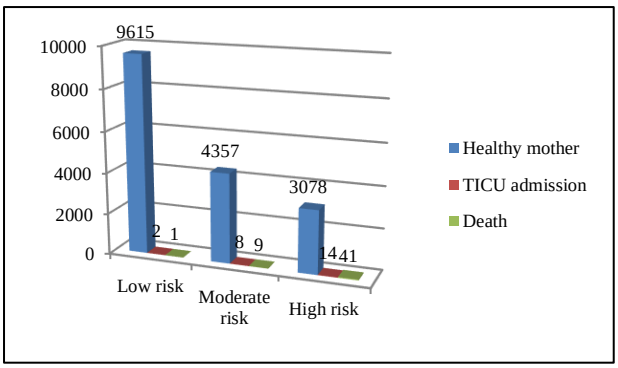

Figure 4: Maternal outcome of study participants (n=17,101).

The proportion of maternal death was more among mothers belonging to the high-risk group (1.31%) than from moderate (0.21%) and low risk group (0.01%). Similar mothers needing ICU admission was more among high-risk group (10%) mothers than moderate (0.2%) and low risk group (0.02%).

DISCUSSION

In this present study of 17101 cases admitted in labour room, parameters such as age, parity, registration, geographical distribution, socioeconomic status, gestational age, birth weight, maternal and perinatal mortality was studied.

Majority of the patient belong to the age group 20-25years (56.6%) and the present study was comparable with both Aysha et al and Jain et al as the majority of admissions from all the three studies were from the age group of 20-24 years and least belonged to the age group more than 36 years in all the three studies.[6,7] The risk of miscarriage and genetic defects further increases after age 40.[8]

Primi para (78.84%) contributed to the majority of admissions. Controversy prevails in the effect of high parity on these complications since some other studies report no increased incidences of obstetric complications.[9] Registered patients were 98.4% whereas unregistered admissions were 1.6%. 92.95% admissions were ≥37 weeks gestational age. The mode of delivery for 58.1% of patients was vaginal delivery whereas 41.9% delivered by caesarean section. 17101 mothers delivered total of 17426 babies, 95.10 % of women had their babies with them after delivery while NICU admissions were 23.79%, most common cause for admission was jaundice (55.84%) followed by prematurity (18.86%) and LBW (18.69%). Among total 17101 cases studied 56.2% were low risk, 25.5% were moderate risk and 18.3% high risk. NICU death is more common in high-risk group babies.

Age >30 years, unregistered pregnancy, lower socioeconomic status, mode of delivery, maternal and perinatal death proportion was found to be statistically significant difference between three groups.

Three studies have been used for comparison with present study. Comparison has been done with a study conducted by Aysha et al at a public sector tertiary health care center, for maternal and child health (MCH) care, located in Kerala in 1998.[6] It is chief referral center for maternal and child services in that region, very much similar to the present center taken for study. Sample size used for study was 1672. Pregnancies in that hospital were classified according to the risk criteria based on modified Coopland's scoring system. Comparison has also been done in certain modalities with a study conducted over 2 years (2003-2005) by Mufti et al a maternity hospital in Kashmir.[10] Sample size used was 200. Pregnancies in that hospital were classified according to the prenatal scoring system developed by Dutta and Das in 1990. Similar study has been incorporated for comparison, which was conducted in 2014 by Jain et al at a tertiary medical center in Madhya Pradesh.[7] Perinatal outcome was determined through incorporating Hobel's high risk pregnancy screening system (antepartum, intrapartum and neonatal factors) to randomly selected 415 women (no risk score 0-3, low risk score 4-9, high risk score ≥10). Mufti et al and the present study, having used the same scoring system have almost similar results and is comparable as high risk admissions were 15% and 18.3% respectively.[10]

Jain et al also has majority of study group in low risk 46.02% and present study also has majority admissions of low risk group 56.2%.[7] Whereas majority of admissions of Ayesha et al 53.50% and Mufti et al.[6,10] 48.505 belong to moderate risk group on comparison with Aysha et al with maternal mortality rate of 1.2/1000 total births the present study has a higher mortality rate due to the tertiary health care set up of the institute and having a higher inflow of high risk cases to this hospital.[6]

The most common risk factor among all the moderate (37%) and high (46%) risk group was hypertensive disorder followed by anemia. While in the low-risk group previous LSCS was the most common risk factor and all other risk factor being less than 1%. Women with hypertensive pregnancy disorders should have a comprehensive plan of care, which includes prenatal counselling, frequent visits during pregnancy, timely delivery, appropriate intrapartum monitoring and care, and postpartum follow up. Care of these patients involves counselling at every step of the pregnancy to ensure that the woman is aware of the risks to her and her fetus such that she can make informed decisions.[11,12] Patients with anemia should be monitored well in ANC visits, during labor and in postpartum period, close monitoring should be performed for signs of decompensation, infection or thrombosis. Appropriate thromboprophylaxis and contraceptive advice should be provided and hematinic supplementation should continue.[13]

Pregnancy-related acute kidney injury (AKI) in young women worldwide is an important cause of maternal and fetal morbidity and mortality. Patients with renal disease are susceptible to infection. Antibiotics that are reported to be nephrotoxic (particularly the aminoglycosides, cephaloridine, and methicillin) should be avoided. This is sometimes not possible, but whatever drug is chosen, its effect on renal function must be carefully monitored.[14,15]

Limitation of this study is that patients who never visited hospitals for proper ANC visits were missed for screening on the basis of risk factors.

CONCLUSION

Women with a risk score of 0-2 are considered low risk and no assistance apart from simple assistance is necessary. Patients with risk score of 3 to 5 can be handled by doctors at primary health care center provided they are well trained in meticulous management of handling such cases. Scores higher than 6 justify provision of highly skilled management in a tertiary care center or district hospital. which are well equipped with intensive obstetric and neonatal care unit. Referral of these high-risk cases to such institution is then highly justifiable.

The use of this scoring system by Datta and Das can help the obstetrician to identify high risk pregnancy cases and to elaborate a prognosis for the outcome of that pregnancy. The main objective of the "at risk" approach is the optimal use of existing resources for the benefit of the majority. This study shows that caesarean delivery and maternal deaths were greater in the high-risk group. The foetal outcomes like low birth weight, intrauterine death and perinatal mortality are also seen higher in high-risk pregnancy group. Medical disease like hypertension, anemia, diabetes etc. during pregnancy have poor outcome on maternal and foetal outcome. This study suggests that risk stratification of pregnant women will be useful in the prediction of pregnancies with an adverse outcome. This scoring system can thus be used not only as a test for predicting perinatal mortality but also as a simple and cost-effective screening tool for identifying pregnancies at higher risk of perinatal morbidity and mortality so that these are subjected to "high risk care" they need. Targeting high risk pregnancy for special care will further reduce maternal mortality, low birth weight babies and perinatal mortality. Through identification of mothers at risk, the minimum care for all could be ensured while providing guidelines for the diversion of limited resources to those who need them the most. Maternity care providers should be trained in the use of Datta and Das prenatal scoring schedule for risk stratification, based on the study results.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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