ORIGINAL ARTICLE

Perinatal outcome in relation to high risk pregnancies in tertiary care settings

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Abstract:

Introduction: Pregnancy is defined as high risk when it is complicated by one or more medical or obstetric problems and there is likelihood of adverse outcome to the women or her fetus that is greater than the incidence of that outcome in the general population. Pakistan is a developing country with limited resources and a very high maternal and perinatal mortality. 70% of Pakistani women, mostly from rural areas, do not receive antenatal care, which directly contributes to adverse perinatal outcome.

Objective: The aim of our study is to determine the perinatal outcome of high risk pregnancies, in terms of perinatal mortality, still birth, early neonatal death, APGAR score and birth weight.

Material and Methods: It was a descriptive case series study conducted in Department of Gynaecology and Obstetrics at Jinnah Medical College Hospital, Karachi between January 1, 2020 and June 2020 in duration of six months, 287 patients with high risk pregnancies were included. Perinatal outcome was assessed in terms perinatal mortality, still birth and early neonatal death. Following delivery Apgar score was noted at 5 min and birth weight was measured. Quantitative data was presented as simple descriptive statistics giving mean and standard deviation and qualitative variables was presented as frequency and percentages. Data is compiled and results were carried out by SPSS version 23.

Results: Out of total 287 patients, mean maternal age and mean gestational age in our study was 32.56±3.91 years and 34.78±3.05 weeks respectively. Perinatal outcome out of 287 high risk pregnancies was found to be perinatal mortality 30 (10.5%), still birth 33 (11.5%), early neonatal death 27 (9.4%), Apgar score <7 at 5 min 20 (7%) and birth weight <2.5 kg 24 (8.4%) respectively.

Conclusion: Provision of safe motherhood services including antenatal care, clean and safe delivery, and emergency obstetric and neonatal care services at the door step of women will help in reducing the perinatal death.

Keywords: High risk pregnancies, perinatal mortality, still birth, Apgar score.

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Introduction:

Pakistan is a developing country with limited resources and very high maternal and perinatal mortality.[1] 70% of Pakistani women, mostly from rural areas, do not receive antenatal care, which directly contributes to adverse perinatal outcome.[2] Perinatal mortality rate vary widely and may be below 10/1000 for certain developed countries and more than 10 times higher in developing countries.[3] World Health Organization estimated the number of perinatal deaths worldwide to be greater than 7.6 million, with 98% of these deaths occurring in the developing countries.[4] The perinatal mortality rate for Pakistan is estimated to be 95 per 1000 births.[5] A multicentre survey in Pakistan gave the perinatal mortality rate as 92 per 1,000 births with majority of deaths (72%) due to still births[5] achieving Millennium Development Goals (MDGs) probably remains a dream in our setup

and to achieve MDG-4 perinatal mortality ratio (PNMR) needs to be reduced.[4] Two thirds of the neonatal deaths occur in first week of life and of these, two third occur in first 24 hours.[4]

Pregnancy is defined as high risk when it is complicated by one or more medical or obstetric problems and there is a likelihood of adverse outcome to the women or her baby that is greater than the incidence of that outcome in general population.[6] High risk pregnancy accounts for 75% of perinatal morbidity such as IUGR, preterm and low birth weight, Respiratory Distress syndrome, neonatal complications, still births and early neonatal mortality.[3] In country like Pakistan 68% of births take place in domiciliary settings and still births are not reported. The actual PNM figures may be higher due the fact that births and deaths are not recorded regularly in rural areas. Similarly deaths at home are not reported to the health authorities.[7] Categorizing of women into high risk group helps to plan antenatal care with the aim of utilizing resources to prevent adverse outcome of pregnancy and r eduction in perinatal mortality by providing good perinatal services.

The major aim of prenatal care for low risk women are to provide advice reassurance education and support to women and their families, to deal with minor ailments and to carry out screening to confirm that the women continues to be low risk. In high risk women these aims still apply but the major aim is prevention, detection, and management of these problems and factors which adversely affect the health of the mother or/and her baby.[8] Early and aggressive intervention is an important strategy in the care of high risk patients to ensure best possible outcome and to decrease morbidity or mortality before, during or after delivery.

Objective: The rationale of this study is to determine perinatal outcome of high risk pregnancies in our population in terms of perinatal mortality, still birth, early neonatal death, Apgar score and birth weight in order to establish the local perspective as there is paucity of local data.

Material and Methods:
It was a prospective (descriptive) hospital based case series study conducted in a duration of six months between January 1, 2020 and June 2020 at Department of Gynaecology and Obstetrics Jinnah Medical College Hospital, Karachi which is a tertiary care hospital.

The required sample size came out to be 287 patients. By taking the least prevalence of 3.08%, margin of error=2% and confidence level 'C.I'=95%. This sample size was calculated using the WHO software and sampling technique was non probability consecutive.

Sample selection: Inclusion criteria was gestational age > 24 weeks assessed by LMP and dating scan. Women with singleton pregnancy. Fetus in cephalic presentation. Age 20-40 years. Exclusion criteria was gestational age < 24 weeks. Patients with stroke, renal impairment and chronic obstructive pulmonary disease, chronic liver disease and CCF will be excluded. Malpresentation. Congenital anomaly. Multiple gestations. Fever during labor.

Data collection procedure: All patient visiting Department of Gynaecology and Obstetrics, Jinnah Medical College Hospital, Karachi, with informed consent fulfilling the inclusion criteria enrolled in the study, brief history taken. Perinatal outcome assessed in terms of perinatal mortality, still birth, early neonatal death. Following delivery Apgar score noted at 5 min and birth weight measured. The findings of variables as mentioned above entered in Performa attached as annexure.

Permission from the institutional ethical review committee taken prior to conduction of study.

Operational definition:

High risk pregnancy: High risk pregnancy will be labeled in patients who have two or more of the following present in the history.

- History of Hypertension in previous pregnancy (BP > 150/100).
- Gestational diabetes mellitus in current pregnancy at the time of enrollment

Table 1: Perinatal mortality according to indication n=287

Obstetric variable	**Frequency (N=60)**	Percentage%
Elderly Primigravida	49	(17%)
Multigravida	238	(83%)
Postmaturity	28	09.5%
Anemia	45	15.51%
Gestational Diabetes	53	18.05%
Pregnancy Induced Hypertension	76	26.01%
Eclampsia	3	1.0
Oligohydraminos	23	8.0%
Antepartum haemorrhage	58	20.03%
Obstructed labor	6	2 %

Table 2: Perinatal mortality according to maternal age n=287

	Perinatal Mortality		Total
Maternal age(years)	**Yes**	**No**	
21 - 30	10 (9.3%)	97 (90.7%)	107 (100%)
31 - 40	20 (11.1%)	160 (88.9%)	180 (100%)
Total	30 (10.5%)	257 (89.5%)	287 (100%)
P-Value		0.39	

(HbA1c > 6.1%).

- Anemia in current pregnancy at the time of enrollment (Hemoglobin <10.0 grams).
- H/O of obstetric complications such as
- Preterm labor in previous pregnancy (labor occurring before < 36 weeks).
- Antepartum haemorrhage in current pregnancy (bleeding after 24 weeks).
- Previous H/O1 lower segment caesarean section.
- Post-maturity in current pregnancy (> 42 weeks).
- Grandmultipara.
- Elderly primigravidas (Age > 35 years).

Perinatal outcome: Perinatal outcome will be determined by the following:

- Perinatal mortality: Fetal death after 28th weeks of gestation.
- Still birth: An infant ≥ 20 weeks gestation who shows no sign of life after delivery.
- Early neonatal death: Fetal death from birth through to the first 7 days of life.
- Apgar scores of < 7 at five minute.
- Low birth weight <2.5 kg.

Data analysis procedure: Data analyzed on SPSS Version 23. Mean and standard deviations for the quantitative variables like maternal age and gestational age would be calculated. Frequencies and percentages for the qualitative variables like perinatal mortality, still birth, early neonatal death, APGAR score, birth weight would be calculated. Effect modifiers controlled through stratification of maternal age, gestational age and parity to see the effect of these on outcome variables. Post stratification chi square test applied taking p-value of ≤ 0.05 as statistically significant.

Result:

Out of total 287 patients with high risk pregnancies minimum age of the patient was 26 while maximum was 38 years. Mean maternal age in our study was 32.56 years with the standard deviation of ±3.91. Frequency distribution of maternal age showed that 107 (37.3%) and 180 (62.7%) were in age group 21-30 years and 31-40 years respectively.Mean gestational age in our study was 34.78 weeks with the standard deviation of ±3.05. Frequency distribution of gestational age showed that 42 (14.6%), 105 (36.6%) and 140 (48.8%) were in gestational age group 24-31 weeks, 32-36 weeks and 37-42 weeks respectively. Frequency distribution of parity showed that 49 (17.1%), 89 (31%) and 149 (51.9%) were in parity group 0-1, 2-4 and >4 respectively.

Frequency distribution of perinatal mortality, still birth and early neonatal death showed that out of 287 patients, 30 (10.5%) had perinatal mortality, 33 (11.5%) were still born and 27 (9.4%) had early neonatal death. Perinatal mortality according to Obstetric variable is shown in table no.1.

Frequency distribution of APGAR score showed that out of 287 patients, 20 (7%) had APGAR score <7 at 5 min and regarding birth weight 24 (8.4%) had birth weight <2.5 kg.

Stratification for maternal age with respect to perinatal mortality is presented in table no.2 and P-value was 0.03.

Table 3: Perinatal mortality according to gestational age n=287

	Perinatal Mortality		Total
Gestationalage (weeks)	**Yes**	**No**	
24 - 31	02 (4.8%)	40 (95.2%)	42 (100%)
32 - 36	09 (8.6%)	96 (91.4%)	105 (100%)
37 - 42	19 (13.6%)	121 (86.4%)	140 (100%)
Total	30 (10.5%)	257 (89.5%)	287 (100%)
P-Value		0.19	

Stratification for maternal age with respect to early neonatal death showed that 06 (5.6%) and 21 (11.7%) in the maternal age group 21-30 and 31-40 had early neonatal death respectively. P-value was 0.06. Stratification for maternal age with respect to birth weight and for maternal age with respect to APGAR score showed that 08 (7.5%) and 12 (6.7%) in the maternal age group 21-30 and 31-40 had APGAR score <7 at 5 min respectively. P-value was 0.48. Stratification for gestational age with respect to perinatal mortality is presented in table no.3 and for gestational age with respect to still birth showed that 04 (9.5%), 10 (9.5%) and 19 (13.6%) in the gestational age group 24-31, 32-36, 37-42 weeks were still born respectively. P-value was 0.56.

Stratification for gestational age with respect to early neonatal death showed that 03 (7.1%), 13 (12.4%) and 11 (7.9%) in the gestational age group 24-31, 32-36, 37-42 weeks had early neonatal death respectively. P-value was 0.42. Stratification for gestational age with respect to birth weight showed that 04 (9.5%), 08 (7.6%) and 12 (8.4%) in the gestational age group 24-31, 32-36, 37-42 weeks had birth weight <2.5 kg respectively. P-value was 0.92. Stratification for parity with respect to perinatal mortality showed that 04 (8.2%), 11 (12.4%) and 15 (10.1%) in the parity group 0-1, 2-4, <4 had perinatal mortality respectively.P-value was 0.72. Stratification for parity with respect to still birth showed that 10 (20.4%), 06 (6.7%) and 17 (11.4%) in the parity group 0-1, 2-4, <4 were still born respectively. P-value was 0.05. Stratification for parity with respect to early neonatal death showed that 09 (18.4%), 06 (6.7%) and 12 (8.1%) in the parity group 0-1, 2-4, <4 had early neonatal death respectively. P-value was 0.05.

Discussion:

Out of 287 patients, mean maternal age and mean gestational age in our study was 32.56±3.91 years and 34.78±3.05 weeks respectively. Perinatal outcome out of 287 high risk pregnancies was found to be, perinatal mortality 30 (10.5%), still birth 33 (11.5%), early neonatal death 27 (9.4%), Apgar score <7 at 5 min 20 (7%) and birth weight <2.5 kg 24 (8.4%) respectively.Low birth weight (LBW) remains a significant public health problem in many parts of the world and is associated with both short- and long-term adverse consequences. Globally, more than 20 million infants are born with LBW, about 15•5 % of all live births. The prevalence of LBW is high in developing countries (18•5 %), with the highest prevalence in South Asia (27 %) including Pakistan (19 %). LBW infants have an increased risk of mortality during the neonatal period, infancy, childhood and during later during adulthood.[8] Accurate data of PNMR in developing countries is often lacking, however, WHO estimates it between seven to eight million perinatal deaths annually, which give a global PNMR between 50 to 60. The estimated PNMR of Pakistan is 57-81/1000 births.[9]

There is an increased operative delivery rate, intra-qpartum complications and preterm births in high risk group than low risk group and this indicates that presence of one or more risk factors predict the adverse pregnancy outcome.[10] The occurrence of complications, and mortality rate, were found to be higher in preterm infants as compared to those of full-term infants.[11] There are many medical and obstetrical problems, which place the mother and foetus potentially at risk. Several factors have been identified in various studies[10] but in our study the following have be taken into consideration hypertension, anemia, gestational diabetes, hemorrhage, eclampsia, and obstructed labor to identify where improvements can be made in maternal health.[11] In the study the incidence of high risk conditions include anemia(15.51%),gestational diabetes(18.05%), 26.01% of the mothers had pregnancy induced hypertension and 20.03% had APH. This indicates that most of the mothers have pregnancy induced hypertension, APH

and gestational diabetes and anemia when compared to other high risk conditions which is also seen in other studies.[12]

The most commonly recognised reported causes of still birth from developing countries including Pakistan are hypertensive disorders in pregnancy.[13,14] In the study the incidence of pre eclampsia is 26.01% which is comparably higher than a study in Pakistan where it contributes 13%[15] pre-eclampsia has great implication on adverse neonatal outcome. The various complications seen are low APGAR score, IUD, low birth weight, intrauterine growth restriction and increased need for admission to Neonatal Intensive Care Unit.[12]

In Pakistan, the prevalence of anemia among ever-married women aged 15 to 44 is reported to be 26% in urban areas and 47% in rural areas. Iron deficiency anaemia increased the risk of preterm delivery by two times.[11]

Ante-partum haemorrhage is the main determinant of perinatal mortality in Pakistan. In the study it contributes 20% and same incidence is seen in another study in Pakistan[16] and in some other studies it was responsible for one-third of still births in Pakistan and Ghana.[14] In Pakistan, women continue their child bearing in advanced age and taking it as norm and avoid contraception due to religious & social influences.[17] It is a risk indicator of several pregnancy and labor complications including hypertensive disorders, gestational diabetes, prolonged labor, cephalopelvic disproportion necessitating operative delivery, low birth weight, ante-partum and intrapartum fetal loss and neonatal mortality.[17] Both primiparity and parity≥5 have been associated with still birth in our study(62.7%) with advance age including several other studies from developing countries, including Palestine, Nigeria, Vietnam, Ghana, Pakistan, Nepal and Uganda.[15] Previous systematic reviews have found that perinatal mortality is still high due to poor maternal health, lack of adequate antenatal, intra-natal and post-natal care. Improvement in public awareness of health facilities, health status of potential mothers, socio-economic status, literacy rate and adequate peripartum care can prevent large number of perinatal deaths.[15] However, some of adverse effects of pregnancy can be prevented by preconception counseling, better glycemic control, early screening for fetal abnormalities, careful planning of mode and time of delivery and good neonatal care.[18]

Conclusion:

Perinatal deaths are largely the result of poor maternal health, low socio-economic status, lack of health awareness and inadequate care during ante-partum, intra-partum and post-partum period where from almost all obstetric risk factors can be picked up, treated and prevented. The high perinatal mortality rate in present study is comparable to the figures from other institutions and is associated with adverse outcome. Provision of safe motherhood services including antenatal care, clean and safe delivery, and emergency obstetric and neonatal care services at the door step of women will help in reducing the perinatal death. This can be achieved through existing programs of lady health workers, lady health visitors and traditional birth attendants by strengthening the components of health education and home based antenatal care.

Limitations of study: The study is not without limitations as it is a hospital-based study so limiting the other areas of the community and may not expose the accurate prevalence in the community so further studies are needed for more elaboration.

Conflict of interest: none

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Role and contribution of authors:

Shazia Aftab, collected the data, references and did the initial writeup.

Saadia Rashid, collected the data and helped in introduction writing.

Aliya Waheed, collected the data, refereces and helpd in discussion writing.

Asssha Mahesh, critically review the article and made final changes.

Fariha Hussain, collected the data and helped in introduction writing.

Samina Ayaz, collected the data, reference and helped in interpretation of data.

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