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Research Article

Impact of Antenatal Interventions on Neonatal Outcomes Among High Risk Pregnant Women

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Abstract

Introduction: According to WHO, Globally preterm delivery is one of the leading causes of death among under-fives. Preterm babies face the difficulties after their delivery that includes visual, hearing and learning problems [1].

Aim: Evaluate the effectiveness of selected antenatal interventions on neonatal outcomes among high risk pregnant women.

Hypothesis: There is a difference in neonatal outcomes between control and experimental group of high - risk pregnant women after implementation of selected antenatal interventions at 0.05 level of significance.

Methodology: Quantitative research approach, Quasi Experimental multiple time series control group design was used. Sampling technique used for the study was non probability, purposive sampling technique. All High risk pregnant women attended antenatal OPD at Sub District Hospital and District Hospital who met the inclusion criteria were. In total 322 were selected, out of which 161 were in Experimental group and 161 were in Control group. Analysis of the study was done with the sample size of 299 since there was attrition of 23. Selected antenatal interventions were Video assisted teaching on antenatal care and prevention of preterm delivery, Daily monitor sheets for antenatal interventions and exercise, Telephonic confirmation for follow up, Information booklet on antenatal care and prevention of preterm delivery, Minimum eight antenatal visits and Measurement of cervical length.

Results: Findings of the study revealed the gestational age in the control group was 32.36 ± 1.16 whereas in experimental group 39.46 ± 2.34 and the obtained student t' test value is $t_{(299, 0.05)}$ = 17.6696, 0.0001: p < 0.005. Birth weight of the baby is less in control group (2.107 ± 0.77 gms) compare to experimental group (2.849 ± 0.54 gms) and t' value is $t_{(299, 0.05)}$ = 9.9109, 0.0001: p < 0.005. The number of days newborn hospitalized in control group is 15.46 ± 17.752 days whereas in experimental group it is 1.0188 ± 0.082 days and t' test value is $t_{(299, 0.05)}$ = 9.05, 0.0001: p < 0.005.

Conclusion: Findings of the study shows that selected antenatal interventions were effective in terms of reduction of preterm delivery, low birth weight and number of day neonatal hospitalization.

Keywords: Neonatal Outcomes; t Test; Chi- Square Test; Mann-Whitney Test and Wilcoxon Test

Background

Motherhood is the identity of a woman which is influenced by culture. It includes pregnancy, birth and lactation. Women undergo lot of stress during the normal process of mothering, eventually the stress is more while she deliver early.[3] Ideally pregnant women should deliver the baby between 38 - 42 weeks of gestation [2,3].

Preterm birth or early delivery is, defined as delivery or the baby before the term or 37 completed weeks or 259 days of gestation. Childbirth occurring at less than 37 completed weeks, is a major determinant of neonatal mortality and morbidity and has long-term adverse consequences for health [1,4,5]. Preterm birth (PTB) is a substantial health problem that accounts for significant infant morbidity and mortality and poses an economic burden to both individuals and the state of residence [6].

World Health Organization (WHO) 2015 reported that every year about fifteen million babies are born prematurely around the world and that is more than one in ten of all babies born globally. Almost one million children die each year due to complications of preterm birth [1].

Sickle cell disease (SCD) is a hereditary blood disorder prevalent in tribal population of Dadra and Nagar Haveli. SCD can increase the complications during pregnancy and in turn negatively influence pregnancy outcomes. Identification of risk factors in women with improved care before, between and during pregnancies; better access to contraceptives and increased empowerment/education can further decrease the preterm birth rate. There is no any studies explains about factors influencing preterm delivery and its impact conducted in Dadra and Nagar Haveli. Present study brought various influential factors and preventive measures to be carried out in Dadra and Nagar Haveli [7].

Directorate of Medical and Health Services, Dadra and Nagar Haveli is striving for comprehensive and holistic care to the tribal population residing in Dadra and Nagar Haveli. In spite of rendering quality service with 97.88% of antenatal care service coverage, preterm delivery is existing challenge which reflects poor birth outcome [6].

Systematic review conducted by Nancy M., *et al*. (2018) shows that effective implementation of antenatal interventions can prevent preterm delivery. It includes Midwife - led - continuity of care is one of the intervention. More than three-quarters of preterm/premature babies can be saved with often inexpensive care such as essential care during child birth, antenatal steroid injections (given to pregnant women at risk of preterm labour under set criteria to strengthen the babies' lungs) and postnatal care like kangaroo mother care (the baby is carried by the mother with skin-to-skin contact and frequent breastfeeding), and basic care for infections and breathing difficulties. Recommendations on interventions to prevent preterm delivery will reduce the occurrence of preterm delivery and perinatal morbidity related to it [8].

Objectives

Assess the effectiveness of selected antenatal interventions on neonatal outcomes between control and experimental group of high - risk pregnant women.

Hypotheses

H_1: There is a difference in neonatal outcomes between control and experimental group of high - risk pregnant women at 0.05 level of significance.

Methodology

Research approach and design

Quantitative research approach and Quasi Experimental Multiple Time series control group research design was used for the study.

Population

Population for the study is all pregnant women attending antenatal Clinic in Sub District Hospital, Khanvel and District Hospital, Silvassa, Dadra and Nagar Haveli.

Sample

In this study sample includes pregnant women with selected High risk factors such as Teenage pregnancy, Maternal anemia, Previous History of Abortion or Still birth and Pregnant women with both Teenage pregnancy and Maternal Anemia.

Sampling technique

Non-Probability, Purposive sampling technique was used for the study.

Sample size

Sample size was 322, out of which 161 were in Experimental and 161 were in Control group.

Setting

The study was conducted in Sub - District Hospital, Khanvel and District Hospital, Silvassa.

Inclusion criteria

High risk pregnant women

- With teenage pregnancy 13-19 years
- Maternal anemia (less than 11 gm/dl)
- Previous history of abortion
- Previous history of still birth
- Teenage pregnancy and maternal anemia
- Less than 12 weeks of gestation.

Exclusion criteria

High risk pregnant women

- Migrated to other states
- Not willing to participate and come for regular checkup
- Do not knows Hindi, English.

Variables

Independent variable: Selected antenatal interventions

- Video assisted teaching on antenatal care, Warning signs of pregnancy, Antenatal Dietary advice, Demonstration of antenatal exercises and Lactation Counseling
- Assessment of cervical length by USG between 20- 22 weeks of gestation with the help of obstetrician
- Minimum eight Antenatal Visits during 12th week, 20th week, 26th week, 30th week, 34th week, 36th week, 38th week and 40th week and whenever it was required.
- Daily Telephonic Monitoring on compliance to consumption of Tab. FST, Tab. Calcium, Tab. Albendazole and Immunization with Inj. TT.

Outcome variable

Neonatal outcome

- **APGAR Score at 5th minute of birth:** Appearance, Pulse, Grimace, Activity and Reflexes of the newborn immediately after 1st and 5th minute was assessed.
- **Birth Weight of the baby:** Birth weight of the baby was assessed, 2500 kg was considered normal.
- **Health status of the baby:** Health status of the baby was assessed in-terms of sickness and healthy
- **Number of days Hospitalized:** Number of days baby was hospitalized was assessed to identify the neonatal morbidity.

Data collection technique and tool

Data collection technique used for the present study was Self report and Bio-Physiological Measure. Tool used for the study was Interview schedule, Daily Monitor sheet and Record review.

Tryout of the tool

Tryout of the tool was done to check the feasibility and understanding of the sample. Few medical terms were changed and tool was simplified.

Validity and reliability

Content Validity was established with CVI (90%) and Inter rater reliability was done, that shows tool is reliable with 85% score.

Data analysis

Both Descriptive and Inferential statistics was used to evaluate the effectiveness of interventions on maternal outcome.

Results

Table 1: Unpaired 't' test to assess the effectiveness of antenatal interventions on apgar score of the babies at 5th minute, birth weight and number of days baby hopsitalized (N = 312).

Sr. No.	Neonatal outcomes	Group	f	Standard deviation	Standard error	t value, df	p value, Inference
1	APGAR Score at 5th minute	Control	5.79	4.87	0.02	5.68, 310	0.00001***
		Experimental	6.9	1.18	0.02		
2	Birth Weight of the baby	Control	2.107	0.773	0.062	9.9109	0.0001***
		Experimental	2.849	0.5351	0.042		
3	Number of days Hospitalised	Control	15.46	17.7528	1.459	9.05, 299	0.0001***
		Experimental	2.44	1.0188	0.082		

*Significant at 0.05 level, ** Highly significant at 0.01 level, *** Very highly significant at 0.001 level and NS: Non Significant.

Table 2: Mann-whitney and wilcoxon test for effectiveness of antenatal interventions on neonatal outcomes (N = 301).

Sl. No.	Neonatal Outcome	Frequency rank		Mann-Whitney Value	Wilcoxon Value	p value, Inference
		Control Group	Experimental group			
1	Birth Weight of the baby	104.2	197.74	4323.5	15498.5	0.000***
2	Health status of the baby	160.21	143.01	10100.0	21881.0	0.000***
3	Fetal Heart Rate	177.98	125.72	7453.5	19234.5	0.00***
4	APGAR Score at 1st Minute	170.03	133.46	8638.0	20419.0	0.000***
5	APGAR Score at 5th Minute	167.13	136.28	9070.0	20851.0	0.000***
6	Neonatal Hospitalized days	189.93	114.08	5672.5	17453.5	0.000***

*Significant at 0.05 level, ** Highly significant at 0.01 level, *** Very highly significant at 0.001 level and NS: Non Significant.

Table 3: Chi-square tests for effectiveness of antenatal interventions on neonatal outcomes (N = 301).

Sr. No.	Neonatal Outcomes	Variables	Control Group		Experimental Group		λ^2 value, df	p value, Inference
			F	%	f	%		
1	Fetal Weight gain	Appropriate to gestational age	40	26.8	14	9.2	19.156, 2	0.000***
		Lesser than gestational age	107	71.8	130	85		
		Greater than gestational age	2	1.3	9	5.9		
2	Health Status of the baby	Live birth	29	19.5	146	95.4	180.682, 3	0.000***
		Abortion	42	28.2	0	0		
		Still Birth	60	40.3	3	2		
		Twins	18	12.1	4	2.6		

*Significant at 0.05 level, ** Highly significant at 0.01 level, *** Very highly significant at 0.001 level and NS: Non Significant.

Conclusion

Maternal and child health is the vital part of health system. Since we are striving to achieve sustainable goal provision of care during antenatal, intranatal and postnatal is essential. Present study findings shows that there is a significant difference between control and Experimental group, hence the selected antenatal interventions are effective and it helps in reducing preterm delivery and other neonatal complications. Nurse led midwifery care through out the child bearing period can focus on midwifery care and improve the maternal and child health.

Conflict of Interest

Nil.

Grant in Aid

Nil.

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