The effect of birth interval on fetal outcomes

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Abstract

Background: Perinatal mortality includes both deaths in the first week of life and fetal deaths (stillbirths). Over 130 million babies are born every year, and more than 10 million infants die before their fifth birthday and almost 8 million before their first birthday. **Objectives:** To make an effort to find out impact of birth interval on fetal outcomes like, low birth weight (weight less than 2500 grams regardless of gestational age), perinatal death (death within 28 weeks of gestation to 7 days of birth) in subsequent pregnancies. **Methods:** This was a cross-sectional study conducted in BPKIHS, Dharan in 2011. Patients included were women of second gravida between age group 20 -35 years .The consecutive convenience sampling method was used to collect the data. Study population was divided into three birth interval groups of <18, 18-59,>59 months respectively and fetal outcomes (low birth weight, gestational age, early neonatal death, Apgar score) were compared. **Results:** Out of included population majority (55.63%) of the women had age range of 20-25 years with the mean age of 25.30. Among the total 168 who were included 20(11.91%) were belongs to birth interval <18 months, 113(67.26%) were found in 18-59 months group and 35(20.83%) were in >59 months group. **Conclusion:** There was increased risk of preterm and low birth weight and perinatal death in women with birth interval <18 months as compared to women with birth interval 18-59 months and groups >59 months.

Keywords: Birth Interval, Fetal outcome, perinatal mortality

Introduction

Perinatal mortality includes both deaths in the first week of life and fetal deaths (stillbirths). According to Nepal demographic and health survey 2006 the national perinatal mortality rate is 45 per 1,000 pregnancies[1]. Over 130 million babies are born every year, and more than 10 million infants die before their fifth birthday and almost 8 million before their first birthday. Perinatal mortality tends to follow the same geographical pattern as maternal deaths. In Nepal, most of the

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women give birth to their baby within the two years of the first delivery. Now the maternal mortality ratio is 281 per 100,000 live births and the neonatal mortality ratio is 33 per 1,000. Thus, it is necessary to find out whether they have Birth interval is one of the major factors in order to reduce maternal and infant mortality rate as well as other outcome factors like low birth weight, preterm birth. knowledge of birth interval or not. [2]

On the other hand, very few researches have conducted regarding this topic in Nepal. Therefore, researcher was motivated to conduct this research study. This proposed study was make an effort to find out impact of birth interval on fetal outcomes like, low birth weight (weight less than 2500 grams regardless of gestational age), perinatal death (death within 28 weeks of gestation to 7 days of birth) in subsequent pregnancies

Methods

This was a cross-sectional study conducted in BPKIHS, Dharan in 2011. Patients included were women of second gravida between age group 20 -35 years .The consecutive convenience sampling method was used to collect the data. Study population was divided into three birth interval groups of <18, 18-59,>59 months respectively and fetal outcomes (low birth weight, gestational age, early neonatal death, Apgar score) were compared [20]. All second gravida women with previous full term live birth and age between 20-35 years were interviewed with the questionnaire after taking verbal informed consent.

Multiple pregnancy, delivery outside range 24-43 weeks gestation, mothers with medical disease or on any medication for long time, first birth outside the range of 37and42,perinataldeath, birth weight less than 1500gms,discrepancy in previous modes of delivery, birth weight and gestational age, uterine or congenital anomaly and genitourinary infections, maternal hemoglobin level<10gm/dl were excluded. Inter-pregnancy interval was defined as period between first delivery and second conception and was computed as interval between two consecutive deliveries minus gestational age of second infant was taken as the measure of birth spacing. Interval calculated in weeks and converted to months (13weeks=3months).

Gestational age was estimated as interval between the dates of first day of mothers last menstrual period and the infant's birth date .If last menstrual period was missing then gestational age was calculated as clinically using ultrasonography. Birth weight and Apgar was taken directly from the records taken immediately after birth. Low birth weight defined as birth weight <2500 grams. Infant were defined as premature if they were born at <37 weeks, term at 37-42weeks. Perinatal mortality includes both deaths in the first week of life and fetal deaths (stillbirths).

Ethical clearance was obtained from the ethical committee BPKIHS, Dharan. Data was presented as mean +/-SD. Differences between groups was analyzed using SPSS 17.0.The data analysis was done using chi square test .P value of <0.05 was taken as significant value.

Results

This cross-sectional study was conducted in department of Obstetrics and Gynecology of B.P. Koirala Institute of Health Sciences, Dharan, Sunsari in year 2011. One hundred sixty eight patients with were included in the study.

Table 1: Age distribution

Age in years	Frequency	Percentage
20-25	93	55.36%
26-30	66	39.28%
31-35	9	5.34%

Out of included population majority (55.63%) of the women had age range of 20-25 years with the mean age of 25.30.

Table 2: Education Status

Categories	Frequency	Percentage
Illiterate	36	21.43%
Literate	132	78.57%
Total	168	100%

In this study most of the population were found be literate (i.e. can read and write).

Table 3: Occupation

Occupation	Frequency	Percentage
House wife	114	67.9%
Others	54	32.1%

In this study most of them were housewife.

Table 4: Religion distribution

Religion	Frequency	Percentage
Hindu	110	65.5%
Kirat	39	23.2%
Buddhist	15	8.9%
Others	4	2.4%
Total	168	100%

Most of the patients belonged to Hindu religion. 23.2% were found Kirat, and remaining data.

Table 5: Birth interval distribution

Age	Percentage
<18 months	11.91
18-59 months	67.26
>59 months	20.83

Among the total 168 who were included 20 (11.91%) were belongs to birth interval <18 months, 113 (67.26%) were found in 18-59 months group and 35 (20.83%) were in >59 months group.

Table 6: Gestational age of babies

Gestational age in weeks	Frequency	%
28-31	2	1.19

32-36	22	13.09
37-42	144	85.72
Total	168	100

Among the babies most (85.72%) of them were born at the age of 37- 42 weeks of gestation and. 14.28% of babies were preterm as table 7.

The maximum gestation age was 42 weeks and minimum was 28 weeks. The mean gestational age was 38.95 weeks with the standard deviation of 2.415 weeks.

Table 7: Relation between gestational age and birth interval

	Birth Interval in months						Total
	<18 months		18-59 months		>59 months		
Gestational age in weeks	N	%	N	%	N	%	N
28-31	2	100	0	0	0	0	2
32-36	8	36.36	12	54.55	2	9.09	22
37-42	10	6.9	101	70.12	33	22.92	144
Total	20	11.91	113	67.26	35	20.83	168

In women with birth interval <18 months 2 women delivered between 28-31 weeks,8 women delivered between 32-36 weeks and 10 women delivered between 37-42 weeks. Among women with birth interval 18-59 months no deliveries below 32 weeks and 101(70.12 %) term deliveries fall under this group. P value was < 0.05 which was statistically significant. So we could see that women were birth interval between 27-68 months had less preterm deliveries in comparison to those with short interval. (Table 6 & fig.5)

Table 8: Relation between birth weight and birth interval

	Birth interval in months						Total	
	<18		18-59		>59			
Birth weight	N	%	N	%	N	%	N	%
<1500	0	0	0	0	0	0	0	100
1500-2500	12	29.27	25	60.97	4	9.76	41	100
>2500	8	6.30	88	69.29	31	24.40	127	100
Total	20	11.90	113	67.26	35	20.84	168	100

As in table 7 none of the babies born below 1500 grams .Babies born by mothers in the group <27 out of 20, 12 were low birth weight babies .In the group 27-68 months

birth interval 25 babies out of 113 were low birth weight babies .8 babies were weight >2500 in group <27 which is statistically significant at p value <0.5.

Table 9: Relation between perinatal death and birth interval

	Birth interval in months						Total	
	<18		18-59		>59			
Outcome	N	%	N	%	N	%	N	%
Alive	11	7.38	103	69.13	35	23.49	149	100
Death	9	47.37	10	52.63	0	0	19	100
Total	20	11.90	113	67.26	35	20.84	168	100

Among the babies who born under less than 18 months interval 9 were died in early neonatal period .out of 113 babies 10 were died in early neonatal period fall under birth interval between 18-59 months. There was no neonatal death in the group of >59 months.

Discussion

Inter pregnancy interval or birth interval is one of the important determinants for infant mortality and morbidity. Previous studies have shown that short interval between pregnancies has been associated with adverse perinatal outcomes like preterm birth, neonatal death, and intrauterine fetal death. Short intervals also have impact on mother's health and ability to re-establish a proper physiological and psychological balance and recovery from nutritional deficiency after previous pregnancy. Similarly long intervals between two pregnancies have also shown some negative impact in few studies.

In this study it shows as that birth interval was shortest or longer then the risk of for prematurity was increased. The results were similar to study done by Fuentes AF et al [28] in which they had stated that women who conceive less than 18 months after giving birth are about 10-50 %more likely to have a very or moderate premature infant are women whose interpregnancy intervals are between 18 and 59 months. Women for whom whose interpregnancy between a delivery and the next conception is 60 months or more have a similarly elevated risk of giving birth prematurely .55 % of women in the study on which these finding s are based fell into one of these two categories of risky pregnancy, but his study includes a large number of sample size compared to my study where sample size is low.

This study also shows that women with shorter inter pregnancy interval and longer duration had low birth weight babies as compared to normal inter pregnancy group.

Similar results have been shown in studies done by Ochoa SC & Kallan JE[29].Low birth weight accounts for 70% of all perinatal deaths and 50%of infant deaths in developing countries. Interval between pregnancies plays an important role in health status of both mother and child.

In this study pregnancies spaced less than 18 months carries risk of low birth weight, preterm birth which was similar to the study done by Augustin et al also assess the association between interval and feto-infant morbidities when compare t interval <18 months to >18 months were found to be significantly associated with low birth weight and preterm birth .[22]

Similarly the result of this study is similar to the study done via S Bajracharya et al [30] in which they conclude that in women with interval <18 months and >59 months, 33.4% and 16.7%

In this study although I had aimed to see relation of birth interval with four variables of perinatal outcomes, I was able to see only three variables: gestational age and low birth weight and perinatal death within seven days. Apgar score was unable to compare because all babies had 5 minutes score >7. As contraception becomes widely available and social values and norms are changing more people are choosing long intervals. So to find out the optimum duration of birth spacing is today's need

Conclusion

From this study we were concluded that there was increased risk of preterm and low birth weight and perinatal death in women with birth interval <18 months as compared to women with birth interval 18-59 months and groups >59 months.

It was believed when women space birth at least 2 years apart, their children are more likely to survive and to be healthy outcome especially women need to have proper knowledge of birth spacing and the method via which they can maintained the spacing between the pregnancies .Hence it is important to maintain some interval which is more than 2 years for maternal as well as fetal better outcomes. Interval between pregnancies plays an important role in health status of both mother and child.

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