

Study Corelating The Maternal Morbidity With Birth Interval In Rajasthan

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Abstract: Background: Safe motherhood is still a dream for much of India and particularly for its rural population. Promotion of family planning – and ensuring access to preferred contraceptive methods for women and couples – is essential to securing the well-being and autonomy of women, while supporting the health and development of communities woman's ability to choose if and when to become pregnant has a direct impact on her health and well-being. Family planning allows spacing of pregnancies and can delay pregnancies in young women at increased risk of health problems and death from early childbearing.

In present study ,an attempt have been made to find out the factors and magnitude of maternal morbidity with short birth interval and to present why contraceptive awareness is necessary to reduce maternal morbidity

Method: The present study was conducted prospectively on 300 patients who delivered at **VISHAKHA HOSPITAL JAIPUR HOSPITAL** from February 2015 to April 2017.. One group in which birth spacing was up to 2 years another group in which birth spacing was >2 to 4 years.

Birth interval or spacing is defined as the duration between the last delivery and present delivery and were noted in completed years and months.

Results:

1. 13.70% had birth spacing <1 yrs,36.32% of 1-2 yrs,31.66% of >2 to 3 yrs and 18.33% of >3 to 4 yrs. .

2.70.66% from urban area and 29.33% from rural.

3. 53.33% women are illiterate have short birth interval.

4 caesarean more common in shorter birth interval.

Conclusions: This study conclude that successive rapid pregnancies with short interval and impose a great stress on maternal health..

Contraception is the way to prevent closely spaced pregnancy and to reduce the maternal morbidity associated with it. People should be educated regarding the benefits of adequate birth spacing .

Keywords: Contraception, maternal morbidity, Birth interval.

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I. Introduction

Maternal mortality is unacceptably high and remains a top global health priority. According to the **World Health Organization**, about 800 women die from pregnancy- or childbirth-related complications around the world every day In 2013, 289,000 women died during and following pregnancy and childbirth. Almost all of these deaths occurred in low-resource settings, and most could have been prevented. Reduction of maternal mortality has long been a global health priority and is a target in the **UN Millennium Development Goals** (MDG) framework and a key concern of the **Global Strategy for Women's and Children's Health** launched by the UN Secretary-General in September, 2010.

To avoid maternal deaths, it is vital to prevent unwanted and too-early pregnancies. All women, including adolescents, need access to contraception, Women in developing countries have on average many more pregnancies than women in developed countries, and their lifetime risk of death due to pregnancy is higher. A woman's lifetime risk of maternal death – the probability that a 15 year old woman will eventually die from a maternal cause – is 1 in 3700 in developed countries, versus 1 in 160 in developing countries.

- Every day, approximately 800 women die from preventable causes related to pregnancy and childbirth.
- 99% of all maternal deaths occur in developing countries.
- Maternal mortality is higher in women living in rural areas and among poorer communities.
- Young adolescents face a higher risk of complications and death as a result of pregnancy than older women.
- Skilled care before, during and after childbirth can save the lives of women and newborn babies.
- Between 1990 and 2013, maternal mortality worldwide dropped by almost 50%.1

It is important to note that social determinants, including factors such as social exclusion, gender equity, education, and employment play a major role towards health (2) The biological mechanism between short inter pregnancy interval and poor maternal and neonatal outcomes is hypothesized to be due to insufficient time for the mother to recover from the nutritional burden and stress of the previous pregnancy. Specifically, depleted maternal protein, low energy status, and deficiencies in Folic acid and iron have been considered. (3) Inter pregnancy intervals shorter than 18 months are associated with higher risks of adverse pregnancy outcomes. After full term or pre-term delivery, IPIs (inter pregnancy interval) of <18 months and >5 years are associated with increased risk of poor fetal and maternal outcome. (5) Women with a shortened inter pregnancy interval – typically defined as less than 18 months – have a greater chance of adverse obstetric outcomes, with those conceiving at an interval less than six months at highest risk for spontaneous preterm birth, preterm premature rupture of membranes, small for gestational age infants, fetal demise and congenital anomalies (6)

II. High Lights Of Health Status Of Rajasthan

Total population of Rajasthan as per 2011 census is 68,548,437 of which male and female are 35,550,997 and 32,997,440 respectively. Female literacy is 52.12% with a land area approximating 10% for India, Rajasthan is the largest state in the country. More than 60% of the state's total land area is desert, characterized by extreme temperature, low rainfall, and sparse habitation) It is also the eighth most populous state of India, three-quarters of which lives in rural areas (7) The decadal growth rate continues to be high compared to other states. (8)

Seventy-six percent of women in the age-group of 20-49 years were married by the age of 18 years, according to the National Family Health Survey 3). The literacy rate among currently married rural women was 36.2% in 2005-2006 The low family status and inadequate control by women over resources have affected many aspects of their lives. Son preference is reinforced, with women bearing more children in the quest for sons (total fertility rate in 2005-2006 was 3.2, and it was 3.6 for rural women.

Delayed sexual maturation is expected to ease the social pressure for early marriage and cohabitation. After marriage, the young bride eats last, and especially in times of drought and food scarcity, the least. These circumstances of under nutrition continue into adulthood—49% of adolescents aged 15-19 years and 37% of women aged 15-19 years have a subnormal body mass index (BMI) Supplements of iron and folic acid (IFA) tablets reached 58% of women; however, only 13% consumed IFA tablets for 90 days or more The limited availability of private contraceptive provision in rural areas is reflected in the fact that reversible contraceptives were used by only 5% of rural women, against 21% in urban areas. NFHS 3 finding that only 4.6% of women with no child and 16.5% of women with one child used modern contraception while 65% with three children used a modern contraceptive, mostly sterilization (9)

With nearly 70% of urban women delivering in an institution while only 23% of rural women did so. In 2005-2006, only 43% of births were attended by a health professional (10) The proportion of women delivering in institutions changed rapidly following the national introduction of a maternity benefit scheme called *JANANI SURKSHA YOJNA* (literally meaning “mothers' protection plan”) or JSY . In 2006-2007, urban facilities witnessed a 64% increase in the number of deliveries while rural facilities saw only a 12% increase (11) in urban areas where 66% used contraception compared to only 41% in rural areas. . Female sterilization was the most widely-used method, accounting for 76% of total current contraceptive-use . Only 10.2% of married women used reversible contraceptive methods in 2005-2006, with the condom being the most widely-used (5.8%). Only 1.6% and 2% of women used intrauterine devices (IUDs) and oral pills respectively. (12)

The situation was worse for the tribal areas where 83% of the CHCs did not have obstetricians (13) Delivery services were offered by 50% of the government facilities and 24% of the private facilities; caesarean-section facilities were available at 3% of the government facilities and 10% of the private sector (14) With support from the Bill & Melinda Gates Foundation, UNICEF, and United Nations Population Fund (UNFPA), a project to increase access, quality, and use of EMOC services was implemented during 1999-2004. (15). Safe motherhood is still a dream for much of India and particularly for its rural area. In present study ,an attempt have been made to find out the factors and magnitude of maternal morbidity with short birth interval.

Aims and objectives

- 1 to find out the maternal morbidity in relation to birth spacing.
- 2 To know the factors which could be responsible for short birth spacing.
- 3 To know the extend and relation of family planning in birth spacing.
- 4 To present why contraceptive awareness is necessary to reduce maternal morbidity.

III. Material And Methods

The present study was conducted prospectively on 300 patients who delivered at **VISHAKHA HOSPITAL JAIPUR HOSPITAL, RAJASTHAN** from February 2015 to April 2017. The cases were divided into two study groups of 150 each.

Group A - Including cases in which birth spacing was up to 2 years.

Group B - Including those cases in which birth spacing was >2 to 4 years

Birth interval or spacing is defined as the duration between the last delivery and present delivery and were noted in completed year and months..We have been certain criteria for selection of cases

Inclusion criteria:

- 1 Multi women beyond the 28 weeks of pregnancy who admitted to labor room and subsequently delivered there.
- 2 cases in which last delivery has terminated in a live birth and the date of birth was known.

Exclusion criteria:

The certain cases were excluded from the study which were likely influence the result of present study ,these were.

- 1.The cases in whom the date of last delivery was not known.
- 2.The cases in which last delivery had terminated in still birth.
- 3.Cases in which last delivery had terminated in an abortion whether spontaneous or induced.
- 4.Cases of obstetrical complications with pregnancy induced hypertension (PIH), ante partum hemorrhage (APH), RH negative, multiple pregnancy etc. . As these are likely to affect the fetal outcome irrespective of the birth interval.
- 5.Cases complicated with medical disorder such as the diabetes, hypertension ,chronic infection ,heart disease ,torch infection etc as these complications are likely to affect the result of study.

IV. Methods

The cases were studied prospectively .All cases had been evaluated in detail .Personal data were noted for records and follow up ,their socio –economic status, standard of living ,occupation and education status of the couple were enquired in detail, detail present and past Obstetrics history was taken, past history was noted in terms of mode of delivery , pure premium status, place of confinement and status of neonatal outcome .Exact dates of last delivery was elicited from patients accurately .Duration of lactation and post partum amenorrhea were also noted.

In present study special attention was noted to the number of antenatal visits, iron folic acid tablets ,vitamins ,tetanus immunization status. Present delivery status was noted in detail in form of the date and time of delivery, duration of labor, date and time of placental delivery and neonatal outcome included live birth ,sex, weight of baby in kg and complication if any. Any complication during labor ,neonatal morbidity and mortality if any were noted down. Cases were investigated fully (complete blood analysis , complete urine analysis) and complete physical checkup was done to rule out any significant medical disorder which likely to affect the present pregnancy. All the cases enquired about the knowledge of birth spacing and family planning program. An attempt had been made out to find out the factors that intend to use the type of contraceptives and adopt the family planning program for birth spacing whether herself, husband, health workers and doctors

Observation:

- . Observation was based on the following points
- distribution of case according to birth interval
 - rural/ urban
 - booked / un booked
 - age
 - socio economic status
 - gravidity
 - Education status of couple
 - Hemoglobin status
 - Mode of delivery
 - Maternal morbidity
 - Significant previous obstetric history
 - Contraceptive used

- Who intend to follow the family planning

V. Result

Table 1 Distribution of Cases According To Birth Interval

Birth interval	No . of cases	Percentage of cases
<1 year	41	13.70%
1-2 year	109	32%
2-3 yr	95	31.66%
>3 yr	55	18.33%

Maximum number of cases have birth interval of 1-2 yrs (32%)

Table 2 . Relation between interval to urban and rural populationmajority of cases from urban area have more birth interval

URBAN/RURAL DISTRIBUTION	TOTAL NO . OF CASES	BIRTH INTERVAL			
		<2 YRS		2-4 YRS	
		NO.	%	NO.	%
URBAN	212	86	40.56%	126	59.43%
RURAL	88	64	72.72%	24	27.27%

Among rural 72.72% had birth interval of <2 years

Table No. 3 Relation of Birth Interval To Booked/Unbooked Cases

CASES	TOTAL NO. OF CASES	BIRTH INTERVAL			
		<2YRS		2-4 YRS	
		NO.	%	NO.	%
BOOKED	224	96	42.85%	128	57.14%
UNBOOKED	76	54	71.05%	22	28.94%

Tables reveals that 224 cases were booked. Among booked cases majority have long birth interval(57.14%).Among un booked cases majority (71.05%) have short birth interval, shows that awareness plays an important role

Table No. 4 Relation Of Birth Interval To Age Of Mother

AGE (YRS)	TOTAL NO.OF CASES	BIRTH INTERVAL			
		<2YRS		2-4 YRS	
		NO.	%	NO.	%
<20	41	28	68.29%	13	31.70%
21-25	148	79	53.33%	69	46.62%
26-30	97	38	39.17%	59	60.82%
>30	14	5	35.71%	9	64.28%

It found that mother with <20 years have less birth interval.

Table No 5 - Relation Of Birth Interval To Socioeconomic Status

Socioeconomic status	Total no of cases	Birth interval			
		<2 yrs		2-4 years	
		No.	%	No.	%
1	44	16	36.36%	28	63.63%
2	92	30	32.60%	62	67.39%
3	121	78	64.46%	43	35.53%
4	43	26	60.46%	17	39.53%

(based on Prasad classification updated by p . Kumar)

Maximum no. of cases of class 3 & 4 had shorter birth interval <2 years.

Table No 6 Relation Of Birth Interval To Gravidity

GRAVIDITY	Total Number of cases	BIRTH INTERVAL			
		<2 YEARS		2-4 YEARS	
		NO.	%	NO.	%
G2	144	75	52.08%	69	47.91%
G3	100	45	45%	55	55%
G4	38	17	44.73%	21	55.26%
G5	17	13	76.47%	4	23.53%

Table shows as gravidity increase , birth interval decrease

Table 7 Relation of Birth Interval To Education Status

Educational status	Total no of cases	Birth interval			
		<2 yrs		2-4 yrs	
		No.	%	No.	%
ILLITERATE					
MALE	52	43	28.67%	9	6%
FEMALE	130	83	55.33%	47	31.33%
PRIMARY					
MALE	42	28	18.66%	12	8%
FEMALE	46	22	14.66%	24	16%
MIDDLE					
MALE	36	18	12%	16	10.66%
FEMALE	47	18	12%	29	19.33%
HR SECONDARY					
MALE	117	37	24.66%	70	46.66%
FEMALE	65	19	12.66%	46	30.66%
GRADUATE					
MALE	35	12	8%	23	15.33%
FEMALE	6	4	2.67%	2	1.33%
POST GRADUATE					
MALE	35	12	8%	20	13.33%
FEMALE	6	4	2.67%	2	1.33%

TABLE 7 reveals that ONLY 17% father and 43.90% m other were illiterate and had short birth interval. Because both partners were ignorant to deleterious effect of short birth interval and to use the contraceptive so it leads to decrease birth intervals.

Table 8 - Relation of Birth Interval To Haemoglobin Status Of Mother

HB gm%	Total no of cases	BIRTH INTERVAL			
		<2 yrs		2-4 yrs	
		No	%	No	%
<8	20	16	80%	4	20%
8.1-10	247	117	47.36%	130	52.64%
>10	33	4	12.12%	29	87.88%

Table 8 shows that birth interval affect the hemoglobin status. in the present study total 6.66% were moderately anemic ,out of which 80% have short birth interval. Adequate hemoglobin level >10 gm /dl was seen in 11% cases, out of which 87.88% have birth spacing 2-4 years.

Table 9 Relation of birth space to present mode of delivery

Mode of delivery	Total no of cases	Birth interval			
		<2 yrs		2-4 yrs	
		No	%	NO	%
Vaginal					
a Vertex	253	123	82%	130	86.66%
b Breech	15	6	4%	9	6%
Instrumental forceps	4	2	1.33%	2	1.33%
Operative caesarean delivery	28	19	12.66%	9	6%

In both groups frequency of full term normal deliveries (vertex) were maximum (<2 yrs 82% ,2-4 yrs 86.66%). Among other modes caesarean section was more common in less than 2 year duration(12.66%) as compared to 2-4 yrs (6%).Instrumental deliveries was common in both group. This shows high maternal morbidity in less than 2 yrs group.

Table 10 Relation of birth interval to maternal morbidity due to episiotomy and other genital tract injuries

Maternal morbidity	Birth interval			
	2 yrs		2-4 yrs	
	No	%	No	%
Para urethral tear	6	4%	2	1.33%
Cervical tear	5	3.33%	3	2%
Vaginal tear	9	6%	3	2%
Perineum tear	22	14.6%	19	12.6%
episiotomy	36	24%	43	28.6%

Above table shows that maternal morbidity was more common in short birth interval .Incidence of tear were found higher 27.93% in short birth in comparison of 2-4 years group (17.93%).

Table 11 relation of birth interval to other significant maternal morbidity

Maternal morbidity	2 yrs		2-4 yrs	
	No	%	No	%
Caesarean section	19	12.66%	9	6%
hysterectomy	1	0.66%	-	-
Wound gaping & sepsis	6	4%	2	1.33%
PPH and hematomas	27	18%	10	6.67%
Puerperal fever	1	0.66%	-	-
prom	9	6%	25	16.66%
Blood transfusion	16	10.66%	6	4%
miscellaneous	14	9.33%	6	4%

This shows higher incidence of maternal morbidity in <2yrs (62%) than the 2-4 years (38.66%). Incidence of cesarean was double in short birth interval (12.66%) compared to 6% in 2-4 years group. This is due to higher percentage of patients in short birth interval group who have H/O previous cesarean section. Post partum complications were like PPH, hematomas, wound sepsis were more common in shorter birth interval group. This shows the poor vitality of tissue with short birth interval group.

Table no 12 Relation of birth interval to significant previous obstetric history

Previous obstetric history	Birth interval			
	< 2years		2-4 yrs	
	No	%	No	%
Previous cesarean section	16	10.66%	10	7%
Previous infant loss	9	6%	2	1%
Previous H/O pregnancy loss	4	2.66%	2	15

Table 12 shows due to health awareness lacking in short birth interval group the cesarean rate was high because they do not adopt a contraceptive measure even they were advised to do so. Previous infant loss was higher in short birth interval group because couple was anxious for next issue very early.

Table no 13 Relation of spacing with method of contraception used

Contraceptive used	Total no of cases		Birth interval			
			<2 years		2-4 years	
	No	%	No	%	No	%
None	117	39%	82	54.66%	35	23.33%
Oral pills	44	12.66%	14	9.33%	30	20%
condoms	98	32.66%	44	29.33%	54	36%
IUCD	41	13.66%	10	6.66%	31	20.66%

TABLE 13 shows that 39% people not using any contraceptive method for birth spacing. Out of these 70.09% had birth interval of <2 years and 29.91% had birth interval of 2-4 years. In total, condoms were (32.66%) the most preferred means of contraception used. Oral pills and IUCD contraceptives were less likely used by women who had short birth interval (9.33% and 6.66% respectively).

Table no 14 family planning factors influencing the birth interval

BIRTH INTERVAL	Knowledge about conceiving in lactation amenorrhea		Knowledge about the MTP services	
	No	%	No	%
<2 yrs				
Yes	59	39.33%	68	45.33%
no	91	60.66%	82	54.66%
2-4 yrs				
Yes	68	45.33%	104	69.33%
no	82	54.66%	46	30.66%

In the present study, the attempts have been made to find out the factors which influence the birth interval. Table shows almost same result in knowledge of conceiving in lactation amenorrhea. About MTP services <2 years 54.66% have no knowledge while in birth interval of 2-4 years, 69.33% have knowledge of the MTP services. This reflects that people were more aware about maternal health and National Family Welfare Programme in 2-4 years group who were more educated and residing in urban areas.

Table no 15 Relation between the person intend to follow the family planning and birth interval

Birth interval	Who intend to use the family planning	number	percentage
Less than 2 years	Herself	12	8%
	Husband	32	21.33%
	Doctor	11	7.33%
	Health worker	13	8.66%
	Not using	82	54.66%
2-4 yrs	Herself	60	40%

	Husband	24	16%
	Doctor	8	5.33%
	Health worker	26	17.33%
	Not using	35	23.33%

Table 15 reveals that in group with <2 years duration, husband had major role to play in advising family planning. This is followed by health workers and doctors. In group with duration of 2-4 years, the major role was played by women herself (40%) followed by health worker and husband 17.33% and 16% respectively. This shows in higher birth interval women itself take initiative for contraceptives. This directly related to health awareness and education status of females.

VI. Discussion

DIBABA Y¹.et al showed that 27% of births occurred within less than 24 months after a previous birth, showing that a considerable proportion of births were not adequately spaced to promote maternal and child health. About 39% of women reported that their recent pregnancy was unintended. Women with unintended pregnancy are more likely to be illiterate (OR=1.85,95% CI,1.23-2.79), have four or more living children (OR=2.77,95% CI,1.77-4.33), had a previous birth interval of less than 24 months (OR=1.78,95% CI(1.19-2.69), have never used contraception (OR=4.53, 95% CI, 3.05-6.75) and did not desire any more children 16.

Conde-Agudelo A et al, stated that women with short intervals are associated with increased risks of uterine rupture in women attempting a vaginal birth after previous cesarean delivery and utero placental bleeding disorders (placental abruption and placenta previa). Less clear is the association between short intervals and other adverse outcomes such as maternal death and anemia. 17.

Brown W et al suggests that 63% of the increase in MCPR was due to family planning program efforts, 21% due to economic development, and 17% due to social advancement through women's education. Improvement in MCPR, predominately due to family planning programs, is a major driver of the decline in the burden of high-risk births due to high parity, shorter birth intervals, and older maternal age in developing countries. 18

Zilberman B et al found that pregnancies conceived 18 to 23 months after previous birth had the lowest risks of fetal complications--low birth weight, preterm birth, and small size for gestational age. Women with shorter IPI have higher risk of maternal mortality, hypertensive disorders of pregnancy, bleeding and anemia. Studies conducted in developing countries suggest longer IPI-3 to 5 years as the optimal IPI. The relation between short inter pregnancy intervals and adverse perinatal outcomes has been attributed to maternal nutritional depletion,

VII. Summary And Conclusions

- 13.70% had birth spacing <1 yrs, 36.32% of 1-2 yrs, 31.66% of >2 to 3 yrs and 18.33% of >3 to 4 yrs.
- 70.66% from urban area and 29.33% from rural area.
- booked 73.66% and un booked 25.33%.
- 53.33% women are illiterate have short birth interval.
- Scaeserean more common in shorter birth

This study conclude that successive rapid pregnancies with short interval and impose a great stress on maternal health. there is increased risk of serious health such as anemia and hemorrhage which increase the complication during the next pregnancy. By the less birth interval maternal morbidity increases in form of higher cesarean section rates, PPH, haematoma, wound gaping, sepsis, puerperal fever etc.

Contraception is the way to prevent closely spaced pregnancy and to reduce the maternal morbidity associated with it. People should be educated regarding the benefits of adequate birth spacing and detail information should be give about new contraceptive. A variety of communication channel as electronic media, social media, news papers, NGOs, health workers has to devoted to improve women knowledge, attitude, and practice of safe mother health.

If women education level will increase, then communication between husband and wife will increase, result in increase contraception use. In society now the women herself should understand their reproductive right and time has started to take the initiative about their health and in using family planning methods.

Factor which limits contraceptive use is the lacking of knowledge about contraceptives and inaccessibility of family planning methods specially in remote areas. That is good evidence that women education does promote the use of contraception in most developing countries.

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