Original article:

Evaluation of Correlation of Fetal Birth Weight with Socio-Demographic and Anthropometric Profile of Pregnant Women: a Prospective Study

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Abstract:

Background: Average birth weights in rural areas of the developing world were usually 400 to 1000g lower than in industrialised nations, contributing to high levels of neonatal and post-neonatal mortality in such communities. In this study, we evaluated the correlation of fetal birth weight with sociodemographic and anthropometric profile of pregnant women.

Materials & Methods: This is a prospective observational study which was conducted in the Department of Obstetrics and Gynaecology, PBM Hospital, SP Medical College, Bikaner. 500 pregnant women attending antenatal clinic were enrolled after an informed consent. Patient fulfilling the inclusion criteria were enrolled in the study group and detailed history was taken.

Results: Low birth weight was more common in Muslims (38.7%) than in Hindu (37.6%) patients. Among gutka addict patients, low birth was significantly high (73.6%). We found negative relation with chewing gutkha and birth weight of baby. There is positive correlation between BMI and birth weight of baby.

Conclusion: We concluded that muslims had low birth weight babies in comparison to Hindus. Gutka chewers had high incidence of low birth weight babies. Positive correlation of BMI and birth weight was found in our study.

Keywords: Birth Weight, BMI, Religion, Gutkha Chewers.

INTRODUCTION

The proportion of babies with low birth weight (birth weight <2.5kg) ranges between 13% and 43% in the low socio-economic strata of many countries, including some developed nations. Average birth weights in rural areas of the developing world were usually 400 to 1000g lower than in industrialised nations, contributing to high levels of neonatal and post-neonatal mortality in such communities[1]. Not only survival, these neonates also have higher morbidity during their first year of life and exhibit low mental development[2]. Foetal growth assessment is therefore, an important part of antenatal care.

Clinical palpation of fundal height in relation to anatomical landmarks such as umbilicus and xiphisternum, serial measurement of symphysis-fundal height (SFH) and serial sonography are the three available methods for foetal growth assessment. Palpation is subjective and has not been very useful, as distance between anatomical landmarks vary. Serial sonography, though accurate, is not practical due to its high cost in developing country[3-5].

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Equipment is expensive and its operating required specialization. Symphysis fundal height measurements are more scientific, objective, reproducible and reliable to assess foetal growth. Symphysis fundal height reflects the crown rump length of the foetus. However, symphysis fundal height varies in female belonging to different population or race. Hence symphysis fundal height curve should be generated locally from population and ideally every institution should have its own standard curve.

Interventions with the purpose to reduce perinatal morbidity & mortality rates in low income countries should focus upon early detection and management of recognizable risk factors affecting maternal & fetal health. To achieve such interventions, there are "few affordable approaches available. However, a standardized protocol for serial symphysis fundal height (SFH) and abdominal girth measurement using a tape measure and plotting the measurement on customized growth charts has proved to be effective in the antenatal detection of both small and large babies for gestational age as well as in the reduction of unnecessary obstetric referrals.[6] In this study, we evaluated the correlation of fetal birth weight with sociodemographic and anthropometric profile of pregnant women.

MATERIALS & METHODS

This is a prospective observational study which was conducted in the Department of Obstetrics and Gynaecology, PBM Hospital, SP Medical College, Bikaner. 500 pregnant women attending antenatal clinic were enrolled after an informed consent.

Inclusion Criteria

500 pregnant women attending ANC clinic were enrolled for this study with gestational age should be ≥ 14 weeks. Women selected for the study received a detailed explanation before taking informed consent.

Exclusion Criteria

Following patients were excluded from the study -

1. Patients diagnosed with intrauterine fetal demise.
2. Patients with sonographically confirmed major congenital malformations
3. Preterm Delivery

Methods

General physical examination was to done specially to note pallor and pedal oedema. Weight, pulse, BP was taken. Arterial BP measured by ausculatory method with mercury sphygmomanometer, in sitting position, by placing cuff on right arm. BMI calculated.

SFH were measured with a metric tap made of non elastic material. The measurements were taken from the upper border of the symphysis pubis to the highest point of the uterine fundus. The fundus was defined by gentle pressure exerted by ulnar border of left hand in a plane at right angle to the abdominal wall after centralized the uterus by right hand. Measurement was recorded to the nearest 0.5 cm. At the same time, the measurement of abdominal circumference at level of the umbilicus taken with a non elastic tape by cross over technique at the end of a normal expiration.

RESULTS

In present study, we observed maximum number of patients (55.2%) belonged to 21-25 years of age group while maximum number of patients were belonged to urban area (68.25%), we found low birth weight more in Muslims (table 1).

Out of 500 patients, 335 were Hindus and 165 were Muslims. Out of 335 Hindus 3% were belonging from birth weigh <2kg while maximum number of cases were from 2.51-3.50 kg birth weight group (43.3%) and 34.6% were from birth weight 2.00-2.50kg group. As far Muslims concern maximum number of cases were from 2.51-3.00 birth weight group i.e. 40.0%. 33.9%, 17.0%, 4.2% and 4.8% were belonging from birth 2-2.5kg, 3.01-3.5kg, >3.50kg and <2kg respectively. On statistical comparison the difference was insignificant (p>0.05) (table 2).

Out of total 500 cases only 19 cases had taking Gutka during pregnancy and out of them 8(42.1%) had their baby birth weight <2kg while remaining 481 patients who did not taking any Gutka or other tobaccos only 2.1% had their baby birth weight <2kg. When we compare these data the difference was statistically highly significant (p<0.001) (table 3).

We divided BMI in to 4 groups i.e. <19, 19-24.99, 25-29.99 and $\geq$30kg/m^2. In <19 BMI group total 186 patients were found and out of them 40.3% and 36.6% mothers had their baby birth 2.00-2.50 and 2.51-3.00 kgs. Only 3.8% babies had their birth weight <2kg. While in BMI group 25-29.99, 37.5%, 31.3% and 31.3% had their baby birth weight 2.51-3.00, 2-2.50 and 3.00-3.50 kgs respectively. While no patients had their baby birth weight <2kgs and >3.5kg. In BMI $\geq$30 kg/m^2 group all 6(100%) patient were came from baby birth weight >3.50kg group. On statistical analysis, while comparing these data the difference was statistically highly significant (p<0.001) (table 4).

Table 1: Distribution of Cases according to birth weight in relation to Age Group (years)

Birth Weight (kgs)	Age Group (years)								Total	
	$\leq$ 20		21-25		26-30		>30			
	No.	%	No.	%	No.	%	No.	%	No.	%
<2.00	5	3.5	8	2.9	4	5.4	1	11.1	18	3.6
2.00-2.50	52	36.9	102	37.0	17	23.0	1	11.1	172	34.4
2.51-3.00	56	39.7	106	38.4	45	60.8	4	44.4	211	42.2
3.01-3.50	27	19.1	42	15.2	8	10.8	2	22.2	79	15.8
>3.50	1	0.7	18	6.5	0	-	1	11.1	20	4.0
Total	141	100	276	100	74	100	9	100	500	100
p	0.476NS									

Table 2: Distribution of Cases according to birth weight in relation to religion

Birth Weight (kgs)	Religion				Total	
	Hindu		Muslims			
	No.	%	No.	%	No.	%
<2.00	10	3.0	8	4.8	18	3.6
2.00-2.50	116	34.6	56	33.9	172	34.4
2.51-3.00	145	43.3	66	40.0	211	42.2
3.01-3.50	51	152	28	17.0	79	15.8
>3.50	13	3.9	7	4.2	20	4.0
Total	335	100	165	100	500	100
P	0.979NS					

Table 3: Distribution of Cases according to birth weight in relation to Personal History

Birth Weight (kgs)	Personal History				Total	
	Gutka		Non Gutka			
	No.	%	No.	%	No.	%
<2.00	8	42.1	10	2.1	18	3.6
2.00-2.50	6	31.6	166	34.5	172	34.4
2.51-3.00	3	15.8	208	43.2	211	42.2
3.01-3.50	2	10.5	77	16.0	79	15.8
>3.50	0	-	20	4.2	20	4.0
Total	19	100	481	100	500	100
Mean	2.09		2.75			
SD	0.80		0.45			
t	6.102					
p	<0.001					

Table 4: Distribution of Cases according to birth weight in relation to BMI

Birth Weight (kgs)	BMI (kg/m^2)								Total	
	<19		19-24.99		25-29.99		$\geq$30			
	No.	%	No.	%	No.	%	No.	%	No.	%
<2.00	7	3.8	11	4.0	0	-	0	-	18	3.6
2.00-2.50	75	40.3	87	31.5	10	31.3	0	-	172	34.4
2.51-3.00	68	36.6	131	47.5	12	37.5	0	-	211	42.2
3.01-3.50	25	13.4	44	15.9	10	31.3	0	-	79	15.8
>3.50	11	5.9	3	1.1	0	-	6	100	20	4.0
Total	186	100	276	100	32	100	6	100	500	100
r	0.209									
p	<0.001									

DISCUSSION

In present study there were 141(28.2%) cases $\leq$ 20 years age, 276(55.2%) cases in age group 21 to 25 years. 74(14.8%) cases were in age group 20-30 years and 9(1.8%) cases in age group >30 years. Maximum number of cases had age group 21-25 years. Mean age was 22.88±3.28 years. Shoeiri et al[7] study the mean age was 24±4.2 years while in Freire et al[2] study mean age was 26.5 years.

Incidence of low birth weight was more in Muslims (38.7%) in comparison to Hindu (37.6%). On statistical comparison the difference was insignificant (p>0.05) in our study. Srivastava et al[8] (1976) observed that incidence of low birth weight (2.5kg or less) was more in Muslims (32.4%) than Hindus (29.5%). Trivedi et al[9] (1986) observed that there was no difference between the religion of mother of low birth weight and normal delivery.

Most common birth weight group was 2.51-3kg in all these gravidas while least common birth weight was <2 and >3.50kg in gravida 1, <2kg in gravida 2, >3.50 kg in gravida 3, and <2kg in gravida 4 and the difference was statistically insignificant (p>0.05) in our study.

In a study done by Bothner et al[10] maximum cases were primi gravidas and the range of gravida varies up to 6. In Numprasert[11] study the maximum cases i.e. 58.75% were to primi gravida and 41.25% were to multi gravida. In the present study too maximum women were primi gravida.

In present study out of 500 cases, 19(3.8%) cases women different types of Gutka chewer out of them 8(42.1%) had their baby birth weight <2kg and 6 cases i.e. 31.6% women had birth weight <2.5kg, while remaining 481 patients who did not taking any Gutka or other tobaccos only 2.1% had their baby birth weight <2kg. When we compare these data the difference was statistically highly significant (p<0.001) (Table 5).

Senn et al[12] in the year 2009 observed that among the drug abuser/addicted pregnant women, 94% regularly chew tobacco, 9% smoke and 1% used alcohol. 31% are heavy chewers (>10 nuts/day). The principal reasons for pregnant women to chew are: to prevent morning sickness (28%), to prevent having a smelly mouth (26%), the habit of chewing (20%), being addicted (10%). Primigravidity, betel nut chewing and low BMI had a statistically significant impact on birth weight reduction of 467 g (p<0.001), 238 g (p=0.02) and 175 g (p=0.005) respectively.

80% of the women thought that chewing would not have any effect on the fetus. They concluded that given the high use of tobacco chewing among pregnant women, a significant impact on birth weight reduction and a poor knowledge about the adverse health effects of this substance, prevention programs in pregnant women should include betel nut chewing as a risk factor for poor pregnancy outcome.

In present study, BMI less than 19(3.8%) were found in 186 (37.2%) patients were found and out of them 40.3% and 36.6% mothers had their baby birth 2.00-2.50 and 2.51-3.00 kgs. Only 3.8% babies had their birth weight <2kg. While in BMI group 25-29.99, 37.5%, 31.3% and 31.3% had their baby birth weight 2.51-3.00, 2-2.50 and 3.00-3.50 kgs respectively. While no patients had their baby birth weight <2kgs and >3.5kg. In BMI $\geq$30 kg/m^2 group all 6(100%) patient were came from baby birth weight >3.50kg group. On statistical analysis, while comparing these data the difference was statistically highly significant (p<0.001).

Challis et al[13] study in their study observed that mean birth weight in women with BMI below 19 was significantly higher (p<0.001) lower than in women with a normal BMI (19-26) and mean birth weight in women with BMI of 27 and above was significantly higher (p<0.01).

CONCLUSION

We concluded that muslims had low birth weight babies in comparison to Hindus. Gutka chewers had high incidence of low birth weight babies. Positive correlation of BMI and birth weight was found in our study.

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