### A STUDY OF ROUTINE ANTENATAL CARE AND ITS RELATIONSHIP WITH BIRTH WEIGHT IN DIMORIA BLOCK, KAMRUP DISTRICT, ASSAM

Mousumi Krishnatreya<sup>1</sup>, Sajida Ahmed<sup>2</sup>, Kabindra Deva Sarma<sup>3</sup>

#### **HOW TO CITE THIS ARTICLE:**

Mousumi Krishnatreya, Sajida Ahmed, Kabindra Deva Sarma. "A Study of Routine Antenatal Care and its Relationship with Birth Weight in Dimoria Block, Kamrup District, Assam". Journal of Evidence based Medicine and Healthcare; Volume 2, Issue 11, March 16, 2015; Page: 1621-1629.

ABSRTACT: BACKGROUND: Globally, more than 20 million infants are born with low birth weight. The large number of factors that could theoretically influence birth weight indicates that each of them may have rather small individual impact.<sup>[1]</sup> In Assam study indicates the prevalence of low birth weight of 25. 5 %, 13%, and 8. 7%.<sup>[2,3,4]</sup> Again the NFHS 3 data shows that the percentage of at least three ANC in last pregnancy was only 36. 3%. With this rationale, the present study was undertaken from August 2010to July 2011 in Dimoria block with the objective to know the distribution of birth weight in the study area and Relationship of Birth weight with routine antenatal care. METHODS: A total of 257 mothers and their new born were included in the study from 13 randomly selected village of Dimoria block. For calculation the sample size, correction factor for finite population was used. All the relevant information were collected in pre designed and pre tested schedule and the salient findings are summarized below. **RESULT:** Mean birth weight was more in mothers receiving ANC than those who did not. Out of 233 mothers (90. 66%) who had received antenatal care, majority (43. 35%) had 2 antenatal visits. A definite trend of increase mean birth weight was observed with increasing number of antenatal visit of mothers. A trend of decreasing mean birth weight was observed with increasing weeks of gestation at first antenatal checkup which was highly significant. Percentage of low birth weight baby was highest among the mothers who did not receive any doses of TT. Low birth weight babies were highest among the mothers who had not taken any IFA tablet during their pregnancy. **CONCLUSION:** The study reveals that highest number of mothers was availing antenatal care during their pregnancy and it was noted that the mean birth weight was more in mothers receiving ANC than those who did not. To bring down the percentage of low birth weight in the area, universal registration of pregnant women should be ensured.

KEYWORDS: Low birth weight, Ante natal care, Iron folic acid, Tetanus toxoid

#### **INTRODUCTION: MATERIALS & METHODS:**

**Study design:** Community based Cross sectional Study.

**Study area:** The present study has been undertaken in the Dimoria Development Block Kamrup District, Assam.

Study period: August 2010 to July 2011.

**Study population:** The study population comprised of pregnant women in her third trimester and new born within 48 hours of delivery.

Twin babies, stillbirth, maternal death during pregnancy and women residing for less than six month in the area were excluded from the study.

**Sample size and Sampling design:** In the Dimoria Block (study area), the population is 119584 (as per census). There are about 3289 pregnant women which are estimated as follows by taking the current birth rate of Assam as 25/1000 midyear population. (SRS 2010).

Expected pregnant women =Birth rate×population/1000.

=25×119584/1000. =2989. 6 =2990(rounded). Add 10% =2990+299=3289.

This population (pregnant women) will be a finite one and for calculating the sample size, correction factor for finite population is used.

$$n = \frac{N}{1 + N(e)^2}$$

Where:

n=sample size N=3289 e =6% (absolute error). n=3289/1+3289 $(0.06)^2$ =256. 95. =257(rounded).

By this way total number of sample attempted to be studied, was worked out to be 257. To get this required sample size for the study, 13 villages were selected from 144 villages of Dimoria Block by simple random sampling technique. (Taking pregnant women is around 3% of each village population).

**Data collection Tool:** Data were collected in Pre designed, pre tested, semi-structured schedule. Weighing machine (Edride), flexible plastic Measuring tape, and UNICEF spring balance also used in the process.

**Data collection Technique:** Data were collected in a Pre designed, pre tested, semi-structured schedule by

- Interview and anthropometric measurement of the pregnant women which was done in the third trimester of pregnancy.
- Weighing of the new borns which was done either by the investigator herself within 48 hours or by the health worker within 48 hours or taken from the hospital record / discharge certificate in case of hospital delivery.
- Relevant records available with the ANM, Health Assistant (female), ASHA and in Health centers.

**DATA ANALYSIS:** The data collected was compiled, tabulated and subjected to statistical analysis wherever applicable. Statistical significance test like ANOVA and't' test were employed where appropriate. Since birth weight depends on many factors and some of them are

J of Evidence Based Med & Hithcare, pISSN- 2349-2562, eISSN- 2349-2570/ Vol. 2/Issue 11/Mar 16, 2015 Page 1622

interrelated, a linear regression analysis (multiple linear regressions) was also used to assess the independent effect of some of these factors. The analysis was done in computer using MS excel package and SPSS. 11. 5 software.

Required Ethical permission was obtained beforehand

**RESULTS:** It was observed in the study that out of 257 new born, 28. 40% babies was low birth weight (Table 1).

The percentage of mother receiving ANC was 90. 66%. Mean birth weight was more in mothers receiving ANC than those who did not. This difference was statistically significant. (Table 2).

Out of 233 mothers who had received antenatal care, 43. 35% had 2 antenatal visits. Only 17.17% had antenatal visit more than 3 times. The percentage of low birth weight was highest (63. 64%) among mothers, having only 1 ante natal visit. A definite trend of increase mean birth weight was observed with increasing number of antenatal visit of mothers. These differences were statistically significant (p < 0.05) (Table 3).

A trend of decreasing mean birth weight was observed with increasing weeks of gestation at first antenatal checkup which was significant (Fig. 1). The number of low birth weight baby was highest (66. 67%) among mothers availing ANC after 32 weeks of gestation.

It was observed that 75. 10% of mother received two doses of tetanus toxoid whereas only 7.39% received one dose of tetanus toxoid. Percentage of low birth weight baby was highest (75%) among the mothers who did not received any doses of TT. Mean birth weight was highest in the mothers receiving two doses of TT but it was not significant statistically (Table 4).

Only 1.95% of mother took >100 numbers of IFA tablet during their pregnancy. Low birth weight babies were highest among the mothers who had not taken any IFA tablet during their pregnancy, Mean birth weight was highest in the mothers taking >100 IFA during pregnancy. These differences were statistically significant (Fig. 2).

Table 5 indicate that when multiple linear regressions method was applied, factors like gestational week at first ante natal checkup and total number of ANC had independent association with birth weight whereas IFA supplementation and TT administration had no such independent effect on birth weigh

**DISCUSSION:** It was found from the study that the out of 257 mothers, 233 (90. 66%) availed antenatal services and rest did not. In the study conducted in Assam found that 88. 24% of women had availed antenatal care (ANC).<sup>[2]</sup> The proportion of low birth weight was more (75%) in mothers not receiving ANC than the mothers receiving ANC. There was a significant difference of mean birth weight between mothers receiving ANC and those who did not. Similar observation was reported by Easmin E (1997)<sup>[5]</sup> Joshi et al (2005) <sup>[6]</sup> found that the proportion of LBW was maximum (61. 76%) in mothers who did not receive any antenatal care followed by those who received inadequate care (46. 57%). Again Murthy (1988)<sup>[7]</sup> and Akoijam et al<sup>[8]</sup> observed that the percentage of low birth weight babies were more than the booked cases in. These findings corroborate with the present study.

J of Evidence Based Med & Hithcare, pISSN- 2349-2562, eISSN- 2349-2570/ Vol. 2/Issue 11/Mar 16, 2015 Page 1623

It was evident in this study that out of 233 mothers who had received antenatal care, majority (43. 35%) had 2 antenatal visits. About 30% had 3 antenatal visits and only 17. 17% had antenatal visit more than 3 times. These findings corroborates with the findings of Ojah (1996)<sup>[2]</sup> who reported that 30. 59% of women had 3 or more ANC and NFHS 3(2005-2006) data where it was reported that 36. 3% of mothers had at least 3 antenatal (care) visits for their last birth. Baishya (1998) in Goalpara, Assam reported 36% of women availed 3 or more visit. A definite trend of increase mean birth weight was observed with increasing number of antenatal visit of mothers which was found to be significant. WHO multicentre study (1994<sup>[9]</sup> reported a significantly higher mean birth weight in case of women who had four or more antenatal visits.

Timing of first visit during the gestation is important as various morbidities related to pregnancy will manifest at different age of gestation. As is evident, 31. 33% availed their first ante natal checkup before 16 weeks of gestation. While only 2. 57% mother availed ante natal care after 32 weeks of gestation. The number of low birth weight baby was highest (66. 67%) among mothers availing ANC after 32 weeks of gestation. Similar findings were also observed by Kakoty (2000)<sup>[10]</sup> in Guwahati, Assam, where about 32% mothers registered before 16 weeks of gestation. Datta Banik (1978)<sup>[11]</sup> also observed similar finding.

WHO multicentre study (1994)<sup>[9]</sup> showed a statistically significant association between tetanus toxoid immunization and birth weight. In our study percentage of low birth weight baby was highest among the mothers who did not receive any doses of Tetanus toxoid. But no significant difference was observed between doses of tetanus toxoid and mean birth weight.

Out of 67. 32% mother receiving IFA during their ante natal period, only 1. 95% of mother took >100 numbers of IFA tablets during their pregnancy. Mean birth weight was highest in the mothers taking >100 IFA during pregnancy. Statistically significant differences were found between number of IFA consumed and birth weight of new born. In contrast to this, Ojah (1996),<sup>[1]</sup> in Assam observed that16. 8% of mothers completed 100 tablets of IFA and kakoty (2000)<sup>[10]</sup> reported 14. 3% of mothers consumed 100 tablets or more. It should be noted that, there was no regular supply of IFA tablet almost for last two years. This may be a reason for less no of IFA consumption during pregnancy in the study population especially in case of consumption of more than 100 tablets.

Multivariate analysis of data from this study was carried out and presented in table 5. This analysis was done using step wise linear regression in order to determine which factors had a significant, independent association with birth weight. This study addressed many factors which were known to be or suspected to be associated with birth weight. In multivariate analysis, a number of factors were seen to have a significant, independent effect on birth weight.

The factors shown to have an independent association with birth weight were, namely, total number of ANC and time of first ANC Naik & Kulkarni (2003)<sup>[12]</sup> in their hospital based observational study found that ANC visit and TT doses when tested individually were significantly associated with birth weight. But when multiple regressions were applied, these factors are not found to be significantly associated to birth weight. Montserrat 1997<sup>[13]</sup> after doing multiple factor adjusted odds ratio and 95% CI using logistic regression analysis in their case control study, clear and significant trend was observed between the number of pre-natal care visit and risk of low birth weight. WHO multicentre study (1994)<sup>[7]</sup> also reported that after multivariate analysis,

factors like maternal height, infant sex, gestational duration, maternal age, number of antenatal visit, parity, outcome of last pregnancy and pregnancy interval were found to be associated independently with birth weight. All these findings were in conformity to the present study.

**ACKNOWLEDGEMENT:** We thank Dr J. Ojah, Professor and Mrs. A. Saikia, Lecturer statistics, department of Community Medicine, Gauhati Medical College and Mr Bhaswat Das, Consultant, RRC-NE, Guwahati for their help pertaining to this work.

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Birth Weight (In Grams)	Number	Percentage (%)	Mean+ SD			
<2500	73	28. 40	2167. 86 + 133. 63			
2500& Above	184	71.60	2974. 84 + 288. 25			
TOTAL	257	100	2683. 03 + 515. 52			
Table 1: Distribution of new born according to birth weight						

	В	irth wei	ght (gi	ms)			
ANC	<2	2500	≥ 2500		Total (%)	Mean±SD	
	No.	%	No.	%			
Received	55	23. 6	178	76. 4	233(90. 7)	2723. 32+510. 1	
Not received	18	75. 0	6	25. 0	24 (9. 3)	2208. 33+306. 3	
Total	73	28.4	184	71. 6	257(100)	2683. 03+515. 5	
Table 2: Birth weight in relation to antenatal care received by mothers							

F=20. 986 df = 1, 255 p< 0. 001.

**Note:** numbers in parenthesis indicate column wise percentage.

	Bi	irth wei	ght (gi	ns)			
ANC	<2500		>2500		Total	Mean±SD	
	No.	%	No.	%			
1	14	63.6	8	36. 4	22 (9. 44)	2595. 4±757. 4	
2	23	22. 8	78	77. 2	101(43. 35)	2695. 0±510. 7	
3	12	17. 1	58	82. 9	70(30. 04)	2720. 00±440. 9	
>3	6	15. 0	34	85.0	40(17. 17)	2915. 00±411. 0	
Total	55	23. 6	178	76. 4	233(100)	2723. 32±510. 11	
Table 3: Number of Antenatal visit and birth weight							

F=7. 153 df = 3, 229 p< 0. 05

#### Note:

- Analysis done on 233 as 24 mothers had not received ante natal care.
- Numbers in parenthesis indicate column wise percentage.

	Birth weight (gm)				Total	Mean±SD
Tetanus Toxoid	<2500		≥ 2500			
	No.	%	No.	%		
Not received	18	75. 0	6	25. 0	24(9. 34)	2616. 48+769. 1

One dose	10	52.6	9	47. 4	19(7.39)	2437. 50+489. 7
Two dose	40	20. 7	153	79. 3	193(75. 10)	2721. 60+467. 7
Booster	5	23. 8	16	76. 2	21(8. 17)	2595. 24+500. 4
Total	73	28.4	184	71. 6	257(100)	2683. 03+515. 5
Table 4: Birth weight in relation to tetanus toxoid received by the mother						

F=2. 271 df = 3, 253 p> 0. 05.

#### Note:

• Numbers in parenthesis indicate column wise percentage.

SI. No.	Factors	Odds Ratio	Significance (P)
1	Gestational period at first ANC <16 wk 16-20 wk 20-32 wk >32 wk	3. 53 8. 58 20. 54 35. 69	0. 002* 0. 023* 0. 000* 0. 009*
2	Tetanus toxoid two dose booster one dose	1. 16 1. 99 3. 38	0. 826 0. 472 0. 135
3	IFA supplementation >100 tab <100 tab	292243. 96 1094445. 79	0. 999 0. 999
4	Total number of ANC 1 2 3or >3	8. 13 6. 99 0. 78	0. 022* 0. 027* 0. 547
Table	e 5: Multiple Regression Analysis of	f Factors Affect	ing Birth Weight

\* Significant at 5% level of significance. (p=0. 05).



Antenatal visit and Birth Weight

F=28. 574 df=3, 229 p<0. 001.



F=7. 153 df = 3, 229 p< 0. 05.

- Analysis done on 233 as 24 mothers had not received ante natal care.
- Numbers in parenthesis indicate column wise percentage.

#### **AUTHORS:**

- 1. Mousumi Krishnatreya
- 2. Sajida Ahmed
- 3. Kabindra Deva Sarma

#### **PARTICULARS OF CONTRIBUTORS:**

- 1. Associate Professor, Department of Community Medicine, Tezpur Medical College.
- 2. Retd. Professor, Department of Community Medicine, Gauhati Medical College.
- Assistant Professor, Department of Ophthalmology, Gauhati Medical College.

# NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Mousumi Krishnatreya, Associate Professor, Department of Community Medicine, Tezpur Medical College, Tezpur, Assam. E-mail: mousumikrishnatreya15@yahoo.co.in

> Date of Submission: 17/01/2015. Date of Peer Review: 18/01/2015. Date of Acceptance: 02/02/2015. Date of Publishing: 12/03/2015.