

ORIGINAL ARTICLE

Effect of utilization of antenatal services on pregnancy outcome in Aligarh - A Community based studyKhushboo Juneja¹, Najam Khalique², Athar Ansari³, Anees Ahmad⁴, Haroon Khan⁵

¹Assistant Professor, Department of Community Medicine, School of Medical Sciences and Research, Sharda University, Greater Noida; ^{2,3}Professor, ⁴Associate Professor, Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh, India; ⁵Assistant Professor, Department of Community Medicine, SHKM Government Medical College, Nalhar, Mewat, Haryana, India.

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Corresponding Author

Address for Correspondence: Dr Khushboo Juneja, House No-32, J.P Dreams Phase-2, Opposite Indra Public School, Sai Vihar, Soot Mill, G.T. Road, Aligarh, Uttar Pradesh – 202001.

E Mail ID: khushboojuneja22@gmail.com

Citation

Juneja K, Khalique N, Ansari MA, Ahmad A, Khan MH. Effect of utilization of antenatal services on pregnancy outcome in Aligarh - A Community based study. Indian J Comm Health. 2016; 28, 1: 54 - 58.

Source of Funding: Nil **Conflict of Interest:** None declared

Article Cycle

Submission: 08/10/2015; **Revision:** 30/12/2015; **Acceptance:** 06/02/2016; **Publication:** 31/03/2016

Abstract

Background: Low birthweight has long been used as an important public health indicator. Low birthweight is not a proxy for any one dimension of either maternal or perinatal health outcomes rather this indicator is a good summary measure of a multifaceted public health problem that includes long-term maternal malnutrition, ill health, hard work and poor pregnancy health care. **Methods:** The present Community based prospective study was conducted in the field practice areas of the Urban and Rural Health Training Centers, Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh. Registered pregnant women who were in their first trimester and whose Expected Date of Delivery lie within our study period of one year were considered for study. Three home visits were made (two in antenatal period, one in post-natal period). Data was analyzed using SPSS version 20. Percentages, and Chi Square Test used. **Results:** Prevalence of LBW was found to be 40%. Statistically significant association was found between antenatal visits, iron folic acid supplementation and birth weight of baby. **Conclusion:** More number of antenatal visits equate to better antenatal care of females. It may result in better compliance with iron folic acid supplementation and dietary intake and also early detection of any complications thus resulting in lower rates of LBW.

Key Words

Antenatal visits; pregnancy; low birth weight.

Introduction

Birth weight of an infant is the single most important determinant of its chances of survival, healthy growth and development. (1) Low birth weight is not only a major predictor of prenatal mortality and morbidity, but recent studies have found that low birth weight also increases the risk for non-communicable diseases such as diabetes and cardiovascular disease later in life.(2,3) Low birth weight is defined by the World Health Organization (WHO) as weight at birth less than 2500 g (5.5 lb).

Antenatal care can have a beneficial impact on intrauterine growth or gestational duration, either by diagnosis and timely treatment of pregnancy complications (such as toxemia, gestational hypertension or diabetes, antepartum haemorrhage, or cervical incompetence) or by eliminating or reducing modifiable risk factors.(4)

Estimates from community based studies are lacking, especially in Western Uttar Pradesh. Factors contributing to Low Birth Weight are many but vary from region to region.

Aims & Objectives

1. To find out prevalence of Low Birth Weight.
2. To study the effect of antenatal services on pregnancy outcome.

Material and Methods

The present community based prospective study was conducted in the field practice areas of the Urban and Rural Health Training Centers, Department of Community Medicine, Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, Uttar Pradesh. The study subjects included in the study were residents of four registered areas of the urban health training center and seven registered villages of rural health training centre. The study subjects included in the study were residents of all four registered areas of UHTC and seven registered villages of RHTC. All pregnant females registered during first trimester and whose Expected Date of Delivery within our study period of one year were considered for study. Pregnant women who didn't gave consent and who planned to deliver at some place other than Aligarh came under exclusion criteria. Pregnancy resulting in abortion, still birth, twin deliveries were excluded from analysis. Study design was approved by Institutional Ethical Committee. A census of current pregnant women in their first trimester was prepared with the help of ASHA and medicosocial worker of our study area. Subsequent pregnancies were identified for next three months by periodic visits. Three home visits were made (two in antenatal period, one in post-natal period).

- I visit (As soon as she gets enrolled) data on socio-demographic factors was collected. Obstetric history was taken. Dietary history was taken. A complete per abdomen examination, clinical profile along with anthropometric measurements and Blood Pressure was undertaken.
- II visit (between 32-36 weeks) of gestation. Information regarding any medical illness during course of pregnancy. Data on no of tetvac injections and iron-folic acid tablets consumed during pregnancy was recorded. Weight gain, fundal height, abdominal girth and Blood Pressure was recorded. Females included in study were asked to get their hemoglobin estimation done on our centres.
- III visit (after delivery of newborn) questions regarding outcome of delivery and complications

during delivery were asked. Sex of the newborn was noted. Examination of both mother and newborn was done to rule out any complications.

- Weight of the baby was recorded (Institutional delivery –from record, home delivery-within 48 hrs of birth). Data was analyzed using SPSS version 20. Frequency, means, standard deviation was calculated. Chi square test and Fisher's exact test was applied wherever applicable. The value of $p < 0.05$ was considered as significant and $p < 0.001$ was considered as highly significant for this study.

Results

Out of 185 study subjects in their first trimester who planned to deliver in our study areas, 20 (10.8%) subjects had to be excluded as 15 (8.1%) had abortion, and 5 (2.7 %) were lost to follow up. Hence study sample of 165 were followed up with three home visits. Out of these 5 (3.0 %) females were excluded as 2 (1.2 %) had twin delivery and had 3 (1.8 %) still births. Hence statistical analysis was done of 160 subjects.

Majority of mothers both in rural (53.4%) and urban (61.1%) were in age group 20-25 years. Majority of fathers were in the age group 26-30 years (50.0%) in rural areas and ≤ 25 years (40.3%) in urban areas. Approximately same percentage of women had < 4 (48.9 %) or ≥ 4 (51.1 %) visits in rural areas but in urban areas majority of mothers had ≥ 4 visits (75.0 %). No female was found who had not received single dose of tetanus toxoid immunization. Majority of females received two doses of tetvac both in rural (59.1 %) and urban areas (56.9 %). However, 9.1 % of females of rural areas and 5.6 % in urban areas received three doses. More females of urban areas (95.8%) consumed iron and folic acid tablets in comparison to rural (89.8 %) areas. only 10.1% of females of rural areas and 13.0 % of urban areas received > 100 tablets of iron folic acid tablets.

Out of total 160 live newborns, 64 were low birth weight babies. Thus the prevalence of LBW was found to be 40%. In rural areas prevalence was more of LBW babies (54.7%) as compared to urban areas (45.3%). The mean birth weight of all the 160 newborns was 2.58 kg (with SD ± 0.55 kg). As seen from [table 1](#) maximum newborns (50.6 %) lie within range of 2.5-3.4 kg and only 9.4 % newborns were with birth weight 3.5 kg or more.

As seen from [table 2](#), more number of males were born in rural areas (56.8 %) whereas in urban areas more females (51.4 %) were born.

As shown in [table 3](#) a significant association was found between LBW and number of antenatal visits. LBW was found among half the pregnant females with less than 4 antenatal visits (50.8%) whereas it was found in only one-third (33.3 %) of females with more than 4 antenatal visits.

[Table 4](#) shows association of Birth Weight with tetanus toxoid immunization. It can be deciphered from table that lesser number of females with two tetvac doses gave birth to low birth weight babies (37.6%) than those who had received lower doses of Tetanus toxoid immunization (41.8 %). Females with more than two doses also show more percentage of low birth weight.

[Table 5](#) and [Figure 1](#) depicts association of Birth Weight with Iron and Folic acid tablet intake. In this study, a significant association was found between Iron and Folic Acid Intake and birth weight of baby. Proportion of Low birth weight babies was much higher among pregnant female who were not consuming IFA tablets (66.7%) as compared to those who were consuming tablets (37.8 %).

It is clearly evident from Figure-1 that minimum proportion of low birth weight babies (23.5 %) were found in those females who consumed more than 100 IFA tablets. This difference was found statistically significant ($\chi^2 = 8.16$, $df=3$, $p=0.043$).

Discussion

Krammer did meta-analysis of the English and French language medical literature published from 1970 to 1984 and has identified 43 potential factors for low birth weight. The factors vary from one area to another, depending upon geographic, socio-economic and cultural factors. Thus it is necessary to identify factors prevailing in a particular area responsible for low birth weight, so as to plan the strategy to tackle this important problem.(4)

India alone accounts for one third of the global burden of LBW. The prevalence of low birth weight babies is 22.5% as estimated by NFHS-3 (23% in rural and 19% in urban areas). It is to be noted that according to NFHS -3, birth weight was reported only in 34.1% of cases of live births (60% of urban and 25% of rural).(5)

It is approximately similar to prevalence of LBW of Aligarh (37.4 %) according to Annual Health Survey conducted by Government of India.(6) but higher

than that as estimated by NFHS-3.5 Mean birth weight is approximately similar to other studies done by Solanki *et al*, Sachdeva *et al*, Joshi *et al*, Biswas *et al*, Joshi *et al*.(7,8,9,10,11)

As per Government of India (2012-13), only 6.8 % of females in U.P. (Rural-5.4 %, Urban-13.0 %) and only 2.7 % in Aligarh (Rural-1.7%, Urban-5.3 %) had full Antenatal checkup.12 According to NFHS-3, one in three women (34%) received no antenatal care. Seventy-nine percent of urban women received antenatal care from a health professional for their last birth compared with 62 percent of rural mothers.

Joshi *et al* found the utilization of antenatal care was adequate (> 3 antenatal visits) in 58.20% mothers.(11) Metgud *et al* in their prospective study observed that majority (81.0%) of women had made ≥ 3 Antenatal visits. (Crude OR 2.9, 95% CI 2.1–4.0, $p=0.001$). Unregistered mothers had 11 times higher risk of having a LBW baby in comparison to those who had 3 or more visits. (13) A retrospective, cross sectional study by Sachdeva *et al* observed that proportion of low birth babies delivered was highest in mothers, who did not receive any antenatal care, followed by those who received inadequate ANC. The least incidence of LBW babies was observed in mothers utilizing adequate ANC.(14)

While Idris *et al* in their cross-sectional hospital based study reported that highest incidence of low birth weight (56.2%) was observed in the mothers who did not receive any antenatal care, followed by 49.4% in those taking inadequate care.(15) The lowest incidence (18.6%) was observed among those availing adequate care and these differences were statistically highly significant ($z=901$, $p< 0.01$) However, according to results of the community based study done by Biswas *et al*, no significant association was found between number of antenatal checkup and birth weight.(10)

Females receiving more than two tetvac doses shows that they are ignorant regarding proper antenatal care. They might be receiving health care from sources who are lacking in proper knowledge and training. Thus they were likely to get inadequate and improper antenatal care leading to more likelihood of other complications during and after pregnancy including low birth weight babies.

In a cross-sectional community based study conducted at Gulbarga by Madhavi *et al*, 70.94% women received injection Tetanus Toxoid (TT).(16) According to Government of India (2012-13), about

84.1% of pregnant females in U.P. (Rural-83.2 %, Urban-88.0%) and about 86.6 % in Aligarh (Rural-86.6 %,Urban-84.1 %) has received at least one tetanus toxoid injection.(12)

Manna *et al* in their cross-sectional study in West Bengal found that proportion of LBW was more among mothers who had not taken TT injection during pregnancy than among those who had received it. But this finding was statistically insignificant. ($p=0.33$) (Nil-36.5%, TT1- 29.9%, TT2 - 28.9%).(17)

As per Government of India (2012-13), only 9.7 % pregnant females in U.P. (Rural-8.3 %, Urban-16.0 %) and 3.6 % in Aligarh (Rural-2.7 %, Urban-6.0 %) consumed IFA tablets for 100 days or more.12 A cross sectional study carried out by Hayat *et al* also found in their study that iron and calcium supplementation during pregnancy also had a significant association with low birth weight ($p<0.05$). Their data show significant positive effect of iron & calcium supplementation during pregnancy.(18)

Similar to our finding Manna *et al* have also found in their study that mothers who consumed ≥ 100 iron folic acid tablets during their pregnancies delivered less (21.3%) LBW babies than mothers who consumed less than 100 iron folic acid tablets (37.8%) ($p=0.0001$). (17) Metgud *et al* observed that if women did not consume IFA tablets during pregnancy, the chances of having LBW baby was 8 times in comparison with those who consumed ≥ 100 tablets and it was reduced to 2 times if they consumed 50 to 100 IFA tablets.(13)

However, more number of babies with LBW was found with mothers consuming more than 50 iron folic acid tablets and no significant association was found by Dandekar *et al*.(19)

Therefore, MOHFW aims to increase consumption of IFA tablets for pregnant and lactating women by giving 100 mg of elemental Iron and 500 mcg of folic acid daily for 100 days during pregnancy, followed by same dose for 100 days in the post-partum period against nutritional anaemia during pregnancy which is known to predispose to LBW (Government of India, 2013).(20)

Conclusion

Antenatal care had a beneficial impact on pregnancy outcome. The greater the number of contacts with health professionals the better the outcome could be. This study reflects that consuming adequate iron

folic tablets to prevent anaemia and tetanus toxoid immunization would lead to lower incidence of LBW

Recommendation

Findings of the present study shows that prevalence of LBW is high in our area and causality of LBW is multifactorial. Therefore utilization of antenatal services should be increased.

Relevance of the study

Study highlights that a multi prong approach is needed if we want to reduce Low Birth Weight prevalence.

Authors Contribution

Though the notion and strategy were mainly by the first author, all authors have contributed adequately in the intellectual content, understanding of data and preparation of the manuscript.

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Tables

TABLE 1 DISTRIBUTION OF NEWBORNS ACCORDING TO BIRTH WEIGHT

Birth weight (Kgs)	No of newborns	%
< 1.5 kg	4	2.5
1.5-2.4	60	37.5
2.5-3.4	81	50.6
≥ 3.5	15	9.4
Total	160	100.0

TABLE 2 DISTRIBUTION OF NEWBORNS ACCORDING TO PLACE OF RESIDENCE

Criteria	Male N (%)	Female N (%)	Total N (%)
Rural	50 (56.8)	38 (43.2)	88 (100.0)
Urban	35 (48.6)	37(51.4)	72 (100.0)
Total	85(53.1)	75 (46.9)	160 (100.0)

TABLE 3 ANTENATAL VISITS AND BIRTH WEIGHT OF BABY (N=160)

No of antenatal visits	Birth weight of newborn				Total	
	Low birth weight		Normal birth weight		No	%
	No	%	No	%		
<4	31	50.8	30	49.2	61	38.1
≥4	33	33.3	66	66.7	99	61.9
Total	64	40.0	96	60.0	160	100.0

$\chi^2 = 4.809, df=1, p=0.028$

TABLE 4 TETANUS TOXOID IMMUNIZATION AND BIRTH WEIGHT OF BABY (N=160)

Tetanus toxoid immunization	Birth weight of newborn				Total	
	Low birth weight		Normal birth weight		No	%
	No	%	No	%		
1	23	41.8	32	58.2	55	34.4
2	35	37.6	58	62.4	93	58.1
3	6	50.0	6	50.0	12	7.5
Total	64	40.0	96	60.0	160	100.0

$\chi^2 = 0.793, df=2, p= 0.673$

TABLE 5 IRON AND FOLIC ACID TABLET INTAKE (IFA) BIRTH WEIGHT OF BABY (N=160)

IFA intake	Birth weight of newborn				Total	
	Low birth weight		Normal birth weight		No	%
	No	%	No	%		
Yes	56	37.8	92	62.2	148	92.5
No	8	66.7	4	33.3	12	7.5
Total	64	40.0	96	60.0	160	100.0

$\chi^2 = 3.844, df=1, p=0.050$

Figures

FIGURE 1 NUMBER OF IRON AND FOLIC ACID TABLET INTAKE AND BIRTH WEIGHT OF BABY (N=160)

