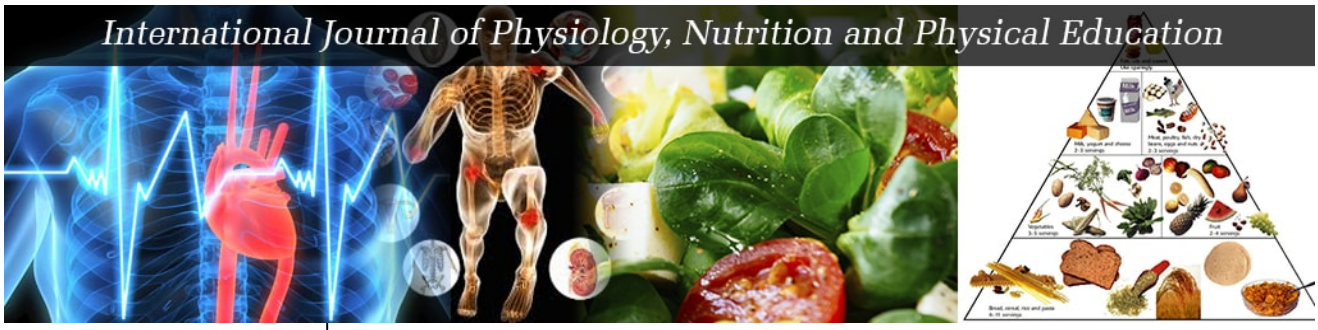

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A study on safe motherhood and child survival in coming days and to reduce infant mortality: Promote maternal and child health care

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Abstract
Pregnant women have been widely recognized as a vulnerable group from health point of view. They need more food than normal person for the proper nourishment of the growing fetus. The field of nutrition of the pregnant women, particularly in rural area, has been sadly neglected.
The present study is a hospital based case control study conducted at Haldia Sub divitional hospital, Purba Medinipur, from 1st May to 31 May 2012.It is an 300 bed hospital with referral population of about 3 laks. It cover the adjoining urban area and peripheral vast rural area as referral hospital of primary health centre and block health centre.
A total of 202 mother were registered for delivery. Eligibility criteria for cases were to deliver a live new born.3 cases were eliminated as because 2 still births occurs to two mothers and one twine was born to one mother. So 199 mothers were eligible for the present study.
A pre-tested structured interview schedule was used for the collection of general information.
The medical data were obtained from hospital record. These include vital age at pregnancy, obstetric history like parity, previous LBW if any, abortion etc. Condition during pregnancy like hypertension, anaemia, diabetics, life style (smoking, alcohol),weight at the time of delivery were noted from hospital record, weight gain during pregnancy were not obtained After birth each new born weight was taken immediately. The sex of the baby was also noted. The weight of the baby was recorded by the sister and the gynaecologist immediately after the birth. Gestational age at the time of delivery was also noted from the hospital record to see whether the baby born is a full term baby or preterm baby. One or prior to delivery or two days after delivery a questionary method was applied to each mother to obtained data about their socio economic condition, level of education, dietary intake, no of antenatal care visited and time of registration etc.
Hemoglobin level was collected from doctor's report for observing the anaemic condition. Based upon the analysis, the study finally emphasizes the need for popularizing cultivation of low cost nutrition greens and vegetables in each household and imparting nutrition education to the village women.

Keywords: Nutritional Anaemia, Obstrectrical Pattern. Trimester. Recommended Daily Allowances (RDA). Supplementary Nutrition

Introduction

In our country newborn death is a major problem beside infant motality in the later stage. In west Bengal the health care system has lost its reputation in proceeding years. At present special emphasis has been given to improve the health care system of all as per WHO norms As a part of this activity special stress has been given to improve the neonatal delivery and management system in hospital both in rural and urban areas. The theme of such activity is to reduce the neonatal death and performed safe delivery.
One of the major causes of neonatal death is low birth weight the presence study aims to observe the neonatal management including delivery in urban and rural areas.
According to the World Health Organization low birth weight (LBW) babies are those born with less than 2500g. Very low birth weight infant weight 1500mg or less and extremely-low birth weight infant weight 1000gms or less [1].
World-wide, about 16% of live births, or some 20million infants per year, are born with less than 2500g of weight and 90% of them are born in developing countries. The prevalence of low birth weight (LBW) varies between and within geographical regions.

The Middle South Asia leads with a prevalence of 31.1% while Asia as a whole has a prevalence of 19.7%. The prevalence of LBW in North America and Europe is 6.8% and 6.5% respectively. In Latin America the percentage of LBW infants is 10.1% whereas in Africa, it is estimated at 14%. A recent study in Tanzania reported a proportion of LBW neonates among term babies ranging between 56% and 62%. Birth weight is a powerful predictor of infant growth and survival. Infants born with low birth weights begin life immediately disadvantaged and face extremely poor survival rates. In most developing countries it was approximated that every ten seconds an infant dies from a disease or infection that can be attributed to low birth weight. Many of those infants who survive suffer cognitive and neurological impairment, increased risk of high blood pressure, obstructive lung disease, cholesterol, renal damage, acute diarrhoea, impaired immune function and poor cognitive development [2].

Generally the risk of neonatal mortality for LBW infants is 25 to 30 times greater than for infants with birth weight exceeding 2500g, and it increases sharply as birth weight decreases. The increase in survival rates of LBW infants leads to increasing health care costs due to extensive hospital stays. It is estimated that extremely LBW babies are up to six times as costly as normal weight babies [3].

Nearly 20 percent of all the babies born in India have a birth weight of less than 2.5 kgs compared with the normal birth weight of 3kgs. This is more prevalent among urban mothers with 24 percent of babies born in urban areas have a low birth rate compared to 14.7 percent in rural areas. More than 96 per cent of low birth weight occurs in the devoloping world, reflecting the higher likehood of these babies being born in poor socio economic conditions, where women are more susceptible to poor diet and infection and more likely to undertake physically demanding work during pregnancy [4]. It reflects, further, a generational cycle of undernutrition, the consequences of which are passed along to children by mothers who are themselves in poor health or undernourished.

LBW is either the result of preterm birth (that is, a low gestational age at birth, commonly defined as younger than 37 weeks of gestational age (that is, a slow prenatal growth rate), or a combination of both.

In general, risk factors in the mother that may contribute to low birth weight include young ages multiple pregnancies, previous LBW infants, poor nutrition, heart disease or hypertension, drug addiction, alcohol abuse, and insufficient prenatal care. Environmental risk factors include smoking, lead exposure, and other types of air pollutions [5].

Classification of low birth weight baby

Preterm baby

Four different pathways have been identified that can result in preterm birth and have considerable evidence: precocious fetal endocrine activation, uterine over distension, decidual bleeding, and intrauterine inflammation/infection [6]. From a practical point a number of factors have been identified that are associated with preterm birth, however, an association does not establish causality.

Baby being small for gestational age

Being small for gestational age can be constitutional, that is, without an underlying pathological cause, or it can be secondary to intrauterine growth restriction, which, in turn, can be secondary to many possible factors. For example, babies with congenital anomalies or chromosomal abnormalities are often associated with LBW. Problems with the placenta can prevent it from providing adequate oxygen and nutrients to the fetus. Infections during pregnancy that affect the fetus, such as rubella, cytomegalovirus, toxoplasmosis, and syphilis, may also affect the baby's weight.

Causes of low birth weight

There are several main reasons why a baby may be born with low birth weight:

Premature birth

Babies born before 37 completed weeks of pregnancy are called premature. About 67 percent of low birth weight babies are premature. The earlier a baby is born, the less she is likely to weigh. Very low birth weight babies (those who weigh less than 3 pounds, 5 ounces or 1,500 grams) have the highest risk for health problems. Some premature babies born near term do not have low birth weight, and they may have only mild or no health problems as newborns. Prenatal care (also known as antenatal care) refers to the regular medical and nursing care recommended for women during pregnancy. Prenatal care is a type of preventative care with the goal of providing regular check-ups that allow doctors or midwives to treat and prevent potential health problems throughout the course of the pregnancy while promoting healthy lifestyles that benefit both mother and child. During check-ups, women will receive medical information over maternal physiological changes in pregnancy, biological changes, and prenatal nutrition including prenatal vitamins. Recommendations on management and healthy lifestyle changes are also made during regular check-ups. The availability of routine prenatal care has played a part in reducing maternal death rates and miscarriages as well as birth defects, low birth weight, and other preventable health problems. So neglect antenatal care result preterm baby, low birth baby etc.

Fetal growth restriction

Preterm labor, labor that happens before 37 completed weeks of pregnancy, frequently results in the birth of a premature, low-birth weight baby. The causes of preterm labor are not thoroughly understood. However, we do know that women with these risk factors are at increased risk for delivering prematurely:

- Had a premature baby in a previous pregnancy
- Are pregnant with twins, triplets or more
- Have certain abnormalities of the uterus or cervix

These babies are called growth-restricted, small-for-gestational age or small-for-date. These babies may be full term, but they are underweight. Some of these babies are healthy, even though they are small. They may be small simply because their parents are smaller than average. Others have low birth weight because something slowed or halted their growth in the uterus.

Some babies are both premature and growth-restricted. These babies are at high risk for health problems. About 10 percent of fetuses are growth-restricted [7, 8]. A health care provider may suspect fetal growth restriction if the mother's uterus is not growing at a normal rate. This can be confirmed with a series of ultrasounds that monitor how quickly the fetus is growing. In some cases, fetal growth can be improved by treating any condition in the mother (such as high blood pressure) that may be contribution factor.

The provider closely monitors the well-being of a growth-restricted fetus using ultrasound and fetal heart rate monitoring. If these tests show that the baby having problems, the baby may need to be delivered early.

Environmental factors

While active maternal tobacco smoking has well established adverse perinatal outcomes such as LBW, that mothers who smoke during pregnancy are twice as likely to give birth to low-birth weight infants. Review on the effects of passive maternal smoking, also called environmental tobacco exposure (ETS), demonstrated that increased risks of infants with LBW were more likely to be expected in ETS-exposed mothers [7]. Researches have shown that elevated blood lead levels in pregnant women, even those well below 10 ug/dL can cause miscarriage, premature birth, and LBW in the offspring. With 10 ug/dL as the Centers for Disease Control and Prevention's "level of concern", this cut-off value really needs to arise more attentions and implementations in the future.

The combustion products of solid fuel in developing countries can cause many adverse health issues in people. Because a majority of pregnant women in developing countries, where rate of LBW is high, are heavily exposed to indoor air pollution, increased relative risk translates into substantial population attributable risk of 21% of LBW [9].

A correlation between maternal exposure to CO and low birth weight has been reported that the effect on birth weight of increased ambient CO was as large as the effect of the mother smoking a pack of cigarettes per day during pregnancy [10]. It has been revealed that adverse reproductive effects (e.g., risk for LBW) were correlated with maternal exposure to air pollution combustion emissions in Eastern Europe and North America-Mercury is a known toxic heavy metal that can harm fetal growth and health, and there has been evidence showing that exposure to mercury (via consumption of large oily fish) during pregnancy may be related to higher risks of LBW in the offspring [11].

It was revealed that, exposure of pregnant women to airplane noise was found to be associated with low birth weight. Aircraft noise exposure caused adverse effects on fetal growth leading to low birth weight and preterm infants [12].

Birth defects

Babies with certain birth defects are more likely to be growth restricted because genetic conditions and structural abnormalities may limit normal development. Babies with birth defects also are more likely to be born prematurely [13].

Chronic health problems in the mother

Maternal high blood pressure, diabetes, and heart, lung and kidney problems sometimes can reduce birth weight [14].

Smoking

Pregnant women who smoke cigarettes are nearly twice as likely to have a low-birth weight baby as women who do not smoke. Smoking slows fetal growth and increases the risk of premature delivery.

Alcohol and illicit drugs

Alcohol and illicit drugs can limit fetal growth and can cause birth defects. Some drugs, such as cocaine, also may increase the risk of premature delivery.

Infections in the mother

Certain infections, especially those involving the uterus, may increase the risk of preterm delivery [15].

Infections in the fetus

Certain viral and parasitic infections, including cytomegalovirus, rubella, chickenpox and toxoplasmosis, can slow fetal growth and cause birth defects.

Placental problems

Placental problems can reduce flow of blood and nutrients to the fetus, limiting growth. In some cases, a baby may need to be delivered early to prevent serious complications in mother and baby.

Inadequate maternal weight gain

Women who don't gain enough weight during pregnancy increase their risk of having a low-birth weight baby. Women of normal weight should usually gain 25 to 35 pounds during pregnancy.

Socioeconomic factors

Low income and lack of education are associated with increased risk of having a low-birth weight baby, although the underlying reasons for this are not well understood. Black women and women under 17 and over 35 years of age also are at increased risk.

Aims and Objectives

Low birth weight (LBW) is an important indicator of infant motality and morbidity as well as of the health care service provided to and utilized by the mother. Based on the findings in literature, the present study is being performed with the aims –

The objective of the present study is to promote maternal and Child Health Care for safe motherhood and child survival in coming days and to reduce infant mortality as far as practicable.

1. To observe the incidence of live birth, low birth weight babies in hospital.
2. To find the difference between LBW babies and normal babies.
3. To assess the age, parity, antenatal visits, socioeconomic conditions of the Mothers admitted to the hospital.
4. To identify possible maternal risk factor associated with LBW babies.
5. To observe the extent of health care facility utilized by the Mothers.
6. To see the medical facility provided in the institutional delivery.

Methods and Materials

The present study is a hospital based case control study conducted at Haldia Sub divitional hospital, Purba Medinipur, from Ist May to 31 May 2012. It is an 300 bed hospital with referral population of about 3 laks. It cover the adjoining urban area and peripheral vast rural area as referral hospital of primary health centre and block health centre.

A total of 202 mother were registered for delivery. Eligibility criteria for cases were to deliver a live new born.3 cases were eliminated as because 2 still birth occurs to two mother and one twine was born to one mother. So 199 mothers were eligible for the present study.

A visit to the obstetrics and Gynaecology department of the hospital were made regularly at the sedule time as instructed by the sister in charge and surgeon of this department.

The following data were collected –

1. The medical data were obtained from hospital record. These includes vital age at pregnancy, obstetric history like parity, previous LBW if any, abortion etc.
2. Condition during pregnancy like hypertension, anaemia, diabetics, life style (smoking, alcohol), weight at the time of delivery were noted from hospital record, weight gain during pregnancy were not obtained.

3. After birth each new born weight was taken immediately. The sex of the baby was also noted. The weight of the baby was recorded by the sister and the gynaecologist immediately after the birth.
4. Gestational age at the time of delivery was also noted from the hospital record to see whether the baby born is a full term baby or preterm baby.
5. One or prior to delivery or two days after delivery a questionary method was applied to each mother to obtained data about their socio economic condition, level of education, dietary intake, no of antenatal care visited and time of registration etc.
6. The weight was measured at the time of delivery by weight machine by following standard norms by the hospital authority.
7. Blood haemoglobin concentration was measured by the cyanmet hemoglobin method.

Statistical analyses

Statistical analysis were made of the relevant data on the basis of

1. Two tail t-test.
2. Correlation coefficient.

Due to various limitations the present study only includes the following data-

1. Age of the mother at the time of the delivery.
2. Parity.
3. Weight of the mother at the time of delivery.
4. Birth weight of each live birth and sex of the babies.
5. Gestational age at the time of delivery.
6. Haemoglobin concentration.
7. Socio economic status etc.

Result

The present study was conducted for a span of one month in Haldia Sub divisional hospital. The parameters recorded are

Mother's weight and babies weight

The mothers were divided into four age groups 19 -23 yrs, 24-28 yrs, 29-33 yrs, 34-37 yrs. Each age group of mothers found to have both mean of normal weight babies and mean of LBW babies weight as shown Table I and Table II. The lowest babies' weight is 1.8 kg and hight babies weight 3.75 kg.

In the age group 19-23 yrs the mother having normal babies have mean body weight 52.52 kg, that for 24-28 yrs have 56.22 kg, 29-33 yrs have 55.82 kg and 34-37 yrs have 59.09 kg. It is found that the mean weight of the mother increase gradually with increase age. The birth weight of the normal babies of such mothers are also revealed from the Table I also. The mean birth weight of the babies for mother of 19-23 yrs are average 2.708 kg, 24-28 yrs mothers have average 3.036kg babies 29-33 yrs mothers have average 2.93 kg babies and 34-37 yrs mothers have average 2.811 kg babies. It is observe that the mean birth weight of the normal babies is highest for the mothers of the age group 24-28 yrs and lowest of the younger group that is 19-23 yrs. From the study, also the number of mothers in each group giving birth to a singleton baby are also known which is 72 for age group 19-23 yrs, 59 for 24-28 yrs 17 for 29-33 yrs and 11 for 34-37 yrs.

Similarly the mean weight of low birth weight babies' mothers and mean weight of LBW babies are known Table II. The mean weight of LBW babies' mothers of 19-23 yrs is found to be 48.52 kg that for 24-28 yrs is 50.92 kg, 28-33 yrs is 51.71 kg and 34-37 yrs is 56 kg. The number of mother 17, 14, 7 and 2 respectively. Similarly the mean birth weights of LBW babies for mother of 19-23 yrs are 2.11 kg, 2.14 kg, 2.11 kg, and 2.05 kg. It is showing on Table no II. The all age groups most of the LBW babies have mean birth weight around 2.11 kg.

The Table VI shows a positive correlation between mothers weight and babies weight in 19-23 yrs age group of Mothers (r=+0.76). This correlation is highly significant in these younger group of mother (p=<0.001). Table VII reveals positive correlation (r=+0.54) between mothers weight and babies weight in the age group 24-28 yrs. This correlation is significant (p=0.05). There is also positive correlation (r=0.89) between mothers weight and babies weight in 29-33 yrs of mothers and this correlation is very significant (p=0.01).No correlation is drown for LBW mothers of age groups 34-37 yrs due to very small number of sample.

The statistical analysis has been made between the mothers weight bearing normal babies and mother weight bearing LBW babies. There is difference in mean weight for mothers having normal babies of age group 19-23 yrs, which is statistically highly significant with mothers of the same age group having LBW babies (p<0.001). similarly mean weight of mothers having normal babies age group 24-28 yrs, which is statistically highly significant with mothers of the same age group having LBW babies (p<0.001).similarly mean weight of mothers having normal babies age group 28-33yrs, which is statistically not significant with mothers of the same age group having LBW babies (p>0.05).No t-test is drawn mothers age group of 34-37 yrs due to very small number of sample (Table X).

The statistical analysis has been made between the normal babies' weight and LBW babies' weight. There is difference in mean weight for normal babies according to mothers age wise 19-23 yrs, which is statistically highly significant with LBW babies weight the same mothers age wise (p<0.001). Similarly mean weight for normal babies according to mothers age wise 24-28 yrs, which is statistically highly significant with LBW babies weight the same mothers age wise (p<0.001). Similarly mean weight for normal babies according to mothers age wise 29-33 yrs, which is statistically highly significant with LBW babies weight the same mothers age wise (p<0.001). No t-test is drawn between normal babies' weight and LBW babies' weight of the mothers' age group 34-37 yrs due to very small number of sample (Table XI).

Mothers Haemoglobin concentration:

In this study haemoglobin concentration of every mother was noted from prescriptions or hospital record. Table VII shows that Hb concentration is found to be average 10.35 gm % for mothers of 19-23 yrs. This is positively correlated with LBW babies weight (r=+0.56) and this correlation significant p<0.05. The Table VII shows positive correlation (r=0.46) between mothers Hb level and LBW babies weight of the mothers 24-28 yrs but this correlation is however found to be insignificant (p>0.05). There is weak positive correlation (r=+0.23) is found between mothers Hb and LBW babies weight of the mothers 29-33 yrs and this correlation is insignificant p>0.05. No correlation is drawn for Hb concentration and LBW babies weight of the mother 34-37 yrs due to small number of sample. The above study reveals the most of the mothers are anemia in nature and anemia may have relationship with LBW babies birth.

The Table XII compared the mean Hb values mother of normal babies and mothers of LBW babies. This group of mothers have Hb level on average above 11 gm % which is

just above the anemic level. There is different in Hb concentration in the mothers of different age group for normal babies and LBW babies. On the basis of Two tail t-test the difference is highly significant for mothers 19-23 yrs ($p<0.001$), insignificant for 24-28 yrs mothers ($p>0.05$) and insignificant for 29-33 yrs mothers ($p>0.05$).No t-test is performed for mothers of age group 34-37 yrs. Bar diagram is given to showing this clearly (fig-6).

Gestational age

Mean gestational age of mothers of normal babies are 36.86 weeks, 36.88 weeks, 36.76 weeks and 36.81 weeks for age groups 19-23 yrs, 24-28 yrs, 29-33 yrs 34-37 yrs respectively. Mean gestational age of mothers of LBW babies are 35.29 weeks, 35.5 weeks, 35.71 weeks, 34.5 weeks for same age groups as revealed from Table no. XIII. The gestational age mothers of normal babies is found to be higher than gestational age of mothers of LBW babies. There is highly significant difference in gestational age between the mother of normal babies and LBW babies of age group 19-23 yrs ($p<0.001$), highly significant in age group of 24-28 yrs ($p<0.001$), insignificant difference in age group of 29-33 yrs ($p>0.05$). No t-test is performed for the age group of 34-37 yrs due to small number of sample.

Antenatal care visit

According to WHO the Government of West Bengal encourage antenatal care of mothers and or mothers are requested to avail at least 3 ANC Visit. If possible more during pregnancy period. It is found small number of mothers registered at IST trimester, most of the mothers 2nd trimester and register at 3rd trimester (Table - IV).

Similarly the antenatal visit less than 2 is 23 and 12 for mothers of normal babies respectively. The antenatal visit is highest (2-4) for most of the mothers, 117 for normal babies mothers, 26 for LBW babies mothers. ANC Visit 5 or more is 19 for mothers of normal babies and only 2 for mothers of LBW babies. The Table –IV shows that LBW babies mother with less than 2 ANC Visit covers 52.17% in comparison to LBW mother having 2-4 ANC Visit Who have 22.22% LBW babies. The mothers who have 5 or more ANC Visit have lowest percent of LBW babies.

Parity

The Table V shows a relationship between parity and LBW. Number of babies of babies are highest both in case of normal birth weight and LBW babies with parity 0.It is lower in case of parity 2.In parity 0 number of mothers of normal babies are 95, mothers of LBW babies are 24. So the percentage of LBW babies is 25.26%.similarly a parity 1 number of mothers of normal babies and LBW babies is 34.14%. Similarly in case of parity 2 number of mothers of normal babies and LBW babies are 23 and 2.The percentage of LBW babies is 8.69.

Categories of birth

The hospital records of different categories of births are shown in Table XIV. There are 199 singleton live birth, 2 still births and 1 twin. 199 live births are included in this study of such live births. There are 55 total preterm babies and 144 total full term babies and the ratio is 1:6:1. The ratio is just opposit for babies with normal body weights.

Socio economic status

The Table –XV shows total BPL 211 and total APL 78.The ratio is 1.55: 1. This indicates the most of the mothers are BPL group. BPL Mothers OF LBW babies Mothers are 25 and APL Mothers OF L BW babies Mothers are 15. BPL Mothers OF Normal babies Mothers are 96 APL Mothers OF normal babies Mothers are 63.

Table 1: Age groups and body weight of mothers and weight of normal babies

Age group of mother	19-23yrs	24-28yrs	29-33yrs	34 -37yrs
Mean weight of normal babies mother(kg)	52.52±4.55	56.22±5.53	55.82±6.17	59.09±7.36
Mean weight of normal babies (kg)	2.70±0.18	3.045±0.30	2.94±0.17	2.78±0.16
Number of mothers having normal babies and normal babies	n=72	n=59	n=17	n=11

Bar diagram showing comparison of normal baby's Mothers weight in kg age wise

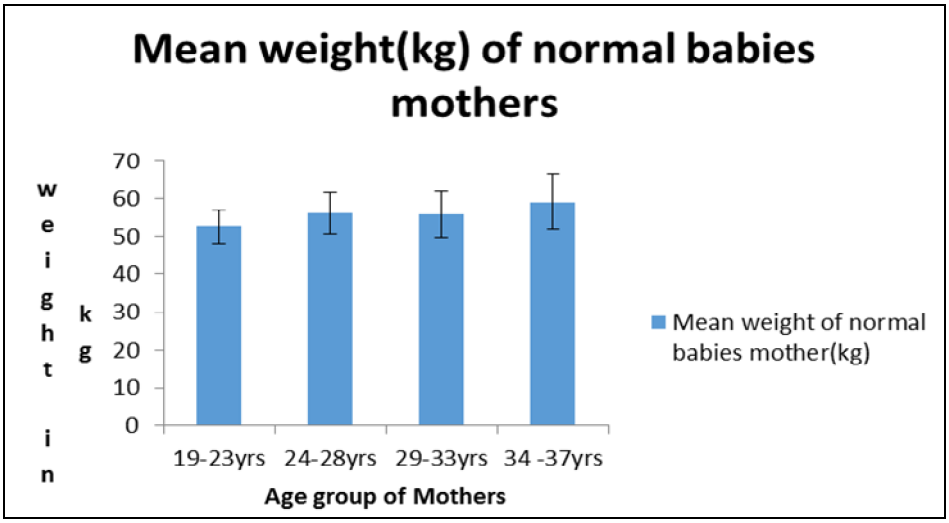


Fig 1

Table 2: Age groups and body weight of mothers and weight of LBW babies

Age group of mother	19-23yrs	24-28yrs	29-33yrs	34 -37yrs
Mean weight of LBW babies mother(kg)	48.58±5.136	50.92±2.786	51.71±2.214	56±2.82
Mean weight of LBW babies (kg)	2.117±0.15	2.142±0.191	2.114±0.177	2.05±0.070
Number of mothers having LBW babies and LBW babies	n=17	n=14	n=7	n=2

Bar diagram showing comparison of LBW baby's weight in kg by age wise of Mothers

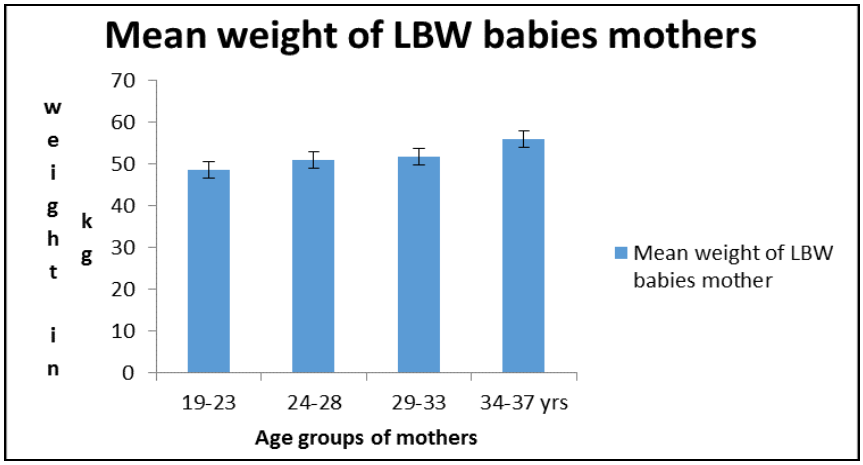


Fig 2

Table 3: Birth weight in relation to sex newborn (n=199)

Birth weight (grams)	Male No.	%	Female No.	%	Total No	%
<1000	0	0	0	0	0	0
1001-1500	0	0	0	0	0	0
1501-2000	2	2.04	6	5.94	8	4.02
2001-2500	22	22.41	36	35.65	58	29.14
2501-3000	58	59.13	45	44.55	103	51.74
3001-3500	15	15.4	13	12.87	28	14.06
>3501	1	1.02	1	0.99	2	1.04
Total	98	100	101	100	199	100

Ratio of male and female is 98:101

No of male and female babies according to birth weight: -

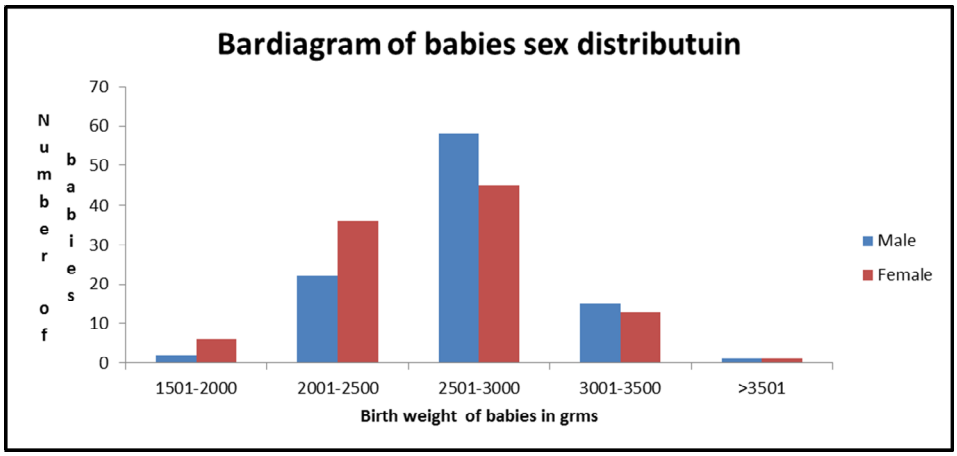


Fig 3

Table 4: Distribution LBW babies according to antenatal care visit (n-199).

Antenatal care	Level	No of normal new borns	No ofLBW babies	% of lbw babies
Registration at	I trimester	35	5	14.28
	II trimester	85	14	16.47
	III trimester	39	21	53.84
	Total	159	40	
ANC Visits	<2	23	12	52.17
	2 to 4	117	26	22.22
	>5	19	2	10.52

Table 5: Relationship between parity and LBW (n=199)

Parity	No of normal new borns	No of LBW babies	%
0	95	24	25.26
1	41	14	34.14
2	23	2	8.69

Table 6: Mean Mothers weight, Mother's Hb concentration of LBW babies of Mothers of age group 19-23 yrs (n=17)

Mothers weight(kg)	Hb conc. (gm%)	Babies weight (kg)
48.58±5.13	10.35±0.712	2.11±0.15

Correlation between Mothers weight and babies weight
r=+0.76 $p<0.001$
Correlation between Mothers Hb level and babies weight
r=+0.56 $p<0.05$

Table 7: Mean Mothers weight, Mother's Hb concentration of LBW babies of Mothers of age group 24-28yrs (n=14)

Mothers weight(kg)	Hb conc.(gm%)	Babies weight(kg)
50.92±2.786	10.82±1.011	2.14±0.19

Correlation between Mothers weight and babies weight
r= +0.54 $p<0.05$
Correlation between Mothers Hb level and babies weight
r=+0.46 $p>0.05$

Table 8: Mean Mothers weight, Mother's Hb concentration of LBW babies of Mothers of age group 29-33yrs (n=7)

Mothers weight(kg)	Hb conc.(gm%)	Babies weight(kg)
51.71±2.2	10.78±0.809	2.11±0.177

Correlation between Mothers weight and babies weight
r=+0.89 $p<0.01$
Correlation between Mothers Hb level and babies weight
r=+0.23 $p>0.05$

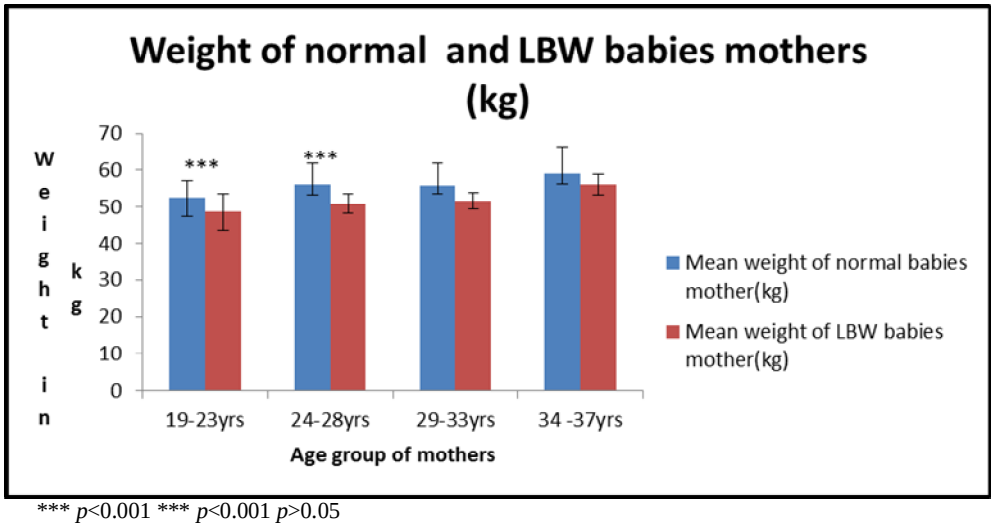
Table 9: Mean Mothers weight, Mother's Hb concentration of LBW babies of Mothers of age group 34-37 yrs

Mothers weight(kg)	Hb conc.(gm%)	Babies weight(kg)
56±2.8	12±0.70	2.05±0.07

Table 10: Comparison of Mean weight of Mothers normal babies and LBW babies distributed age wise of Mother at the time of delivery

Age group of mother	19-23yrs	24-28 yrs	29-33 yrs	34 -37 yrs
Mean weight of normal babies mother (kg)	52.52±4.55	56.22±5.53	55.82±6.17	59.09±7.36
Mean weight of LBW babies mother (kg)	48.58±5.13	50.92±2.78	51.71±2.21	56±2.82
Number of normal babies mother	n=72	n=59	n=17	n=11
Number of LBW babies mother	n=17	n=14	n=7	n=2

Bar diagram showing comparison of normal baby's weight and LBW babies Mothers weight in kg



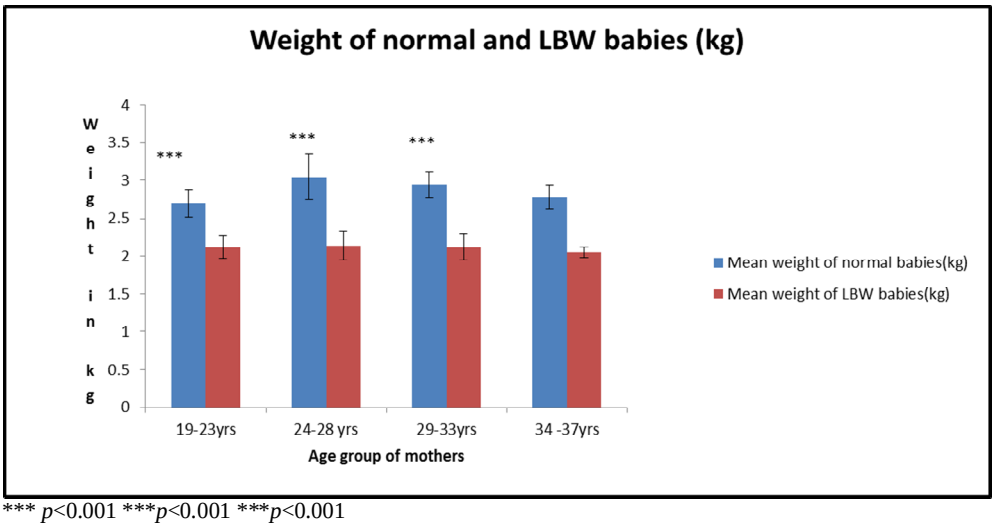
*** $p<0.001$ *** $p<0.001$ $p>0.05$

Fig 4

Table 11: Comparison of average weight of normal babies and LBW babies distributed according to the age of mother.

Age group of mother	19-23yrs	24-28yrs	29-33yrs	34 -37yrs
Mean weight of normal babies (kg)	2.70±0.18	3.045±0.30	2.94±0.17	2.78±0.16
Mean weight of LBW babies (kg)	2.117±0.15	2.142±0.191	2.114±0.177	2.05±0.070
Number of normal babies	n=72	n=59	n=17	n=11
Number of Weight of LBW babies	n=17	n=14	n=7	n=2

Bar diagram showing comparison of normal baby's weight and LBW babies weight in kg



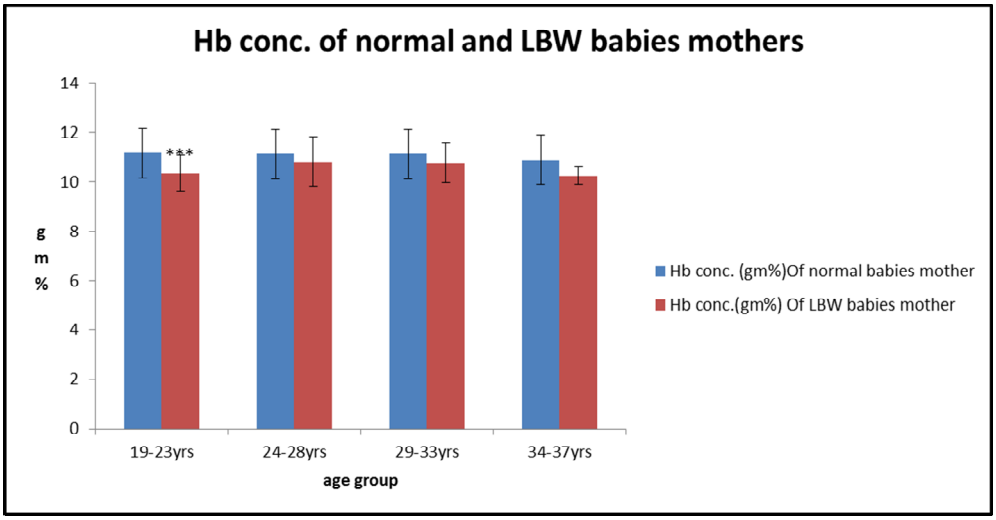
*** $p<0.001$ ***$p<0.001$ ***$p<0.001$

Fig 5

Table 12: Comparison of mean Hemoglobin values (gm%) distributed age wise for mothers of normal babies and LBW babies.

Age group of mother	19-23yrs	24-28yrs	29-33yrs	34 -37yrs
Mean Hb conc.(gm%) Of normal babies mother	11.15±0.68	11.11±0.65	11.123±0.43	10.88±0.35
Mean Hbconc.(gm%). Of LBW babies mother	10.35±0.712	10.82±1.011	10.78±0.80	10.25±0.35
Number Of normal babies mother	n=72	n=59	n=17	n=11
Number Of LBW babies mother	n=17	n=14	n=7	n=2

Bar diagram showing comparison of normal baby's weight and lbw babies Mothers Hemoglobin concentration in gm% :-



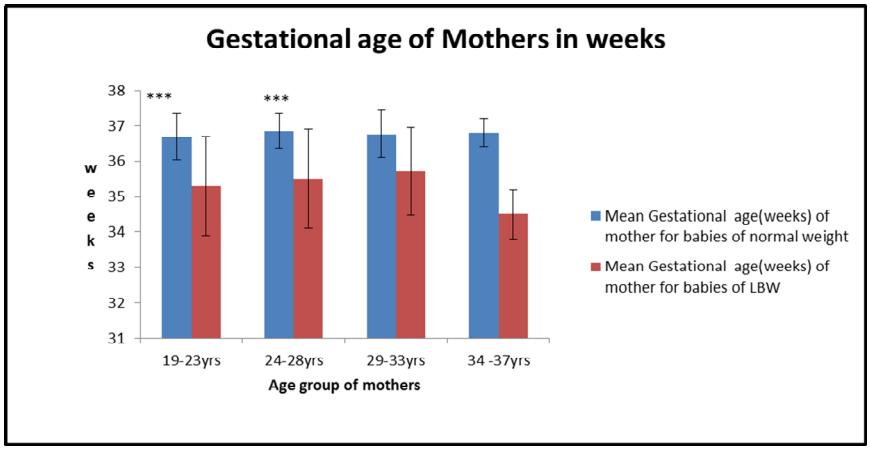
*** $p<0.001$ $p>0.05$ $p>0.05$

Fig 6

Table 13: Comparison of mean gestational age in weeks completed by babies, distributed Mothers age wise

Age group	19-23yrs	24-28yrs	29-33yrs	34 -37yrs
Mean Gestational age (weeks) of mother for babies of normal weight	36.86±0.65	36.88±0.49	36.76±0.66	36.81±0.40
Mean Gestational age (weeks) of mother for babies of LBW	35.29±1.403	35.5±1.40	35.71±1.25	34.5±0.70
Number of Mothers having normal weight babies	n=72	n=59	n=17	n=11
Number of Mothers having LBW babies	n=17	n=14	n=7	n=2

Bar diagram showing comparison of gestational age of normal babies and LBW babies Mothers in weeks



*** $p<0.001$ *** $p<0.001$ $p>0.05$

Fig 7

Table 14: Account of different categories of birth in the hospital in the month of May 2012

Total live birth of singleton babies	199
Total preterm babies	55
Total full term babies	144
Total LBW babies	40
Preterm babies	29
Full term babies	11
Total normal birth weight babies	159
Preterm babies	26
Full term babies	133
*Still birth	2
*Twin	1

Bar diagram of number of births of full term and preterm babies

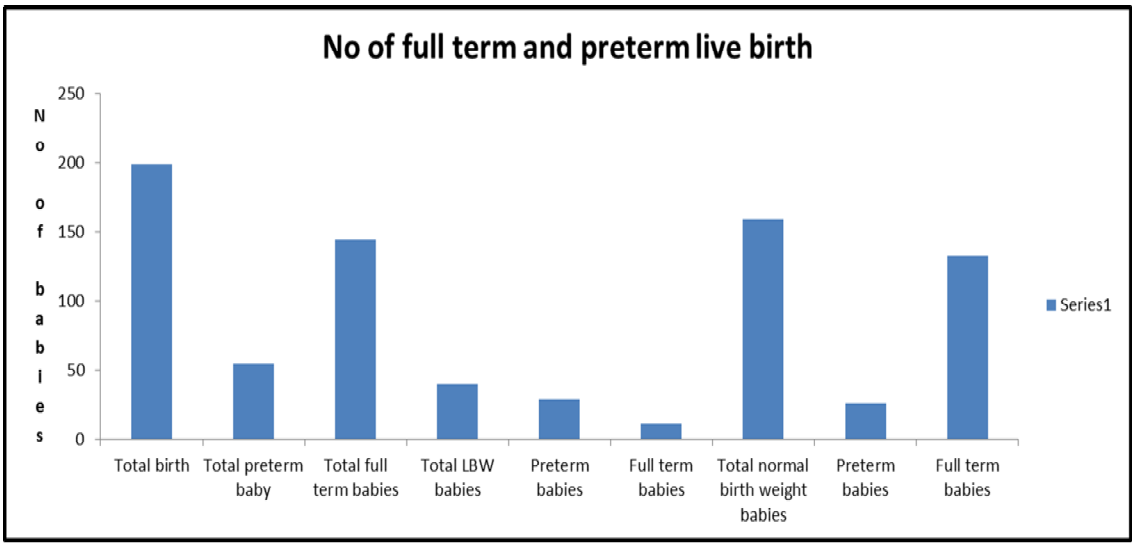


Fig 8

Table 15: Number of mothers under BPL and APL categories

Total BPL	121
Total APL	78
BPL Mothers OF LBW babies Mothers	25
APL Mothers OF L BW babies Mothers	15
BPL Mothers OF Normal babies Mothers	96
APL Mothers OF normal babies Mothers	63

Bar diagram of BPL and APL mothers

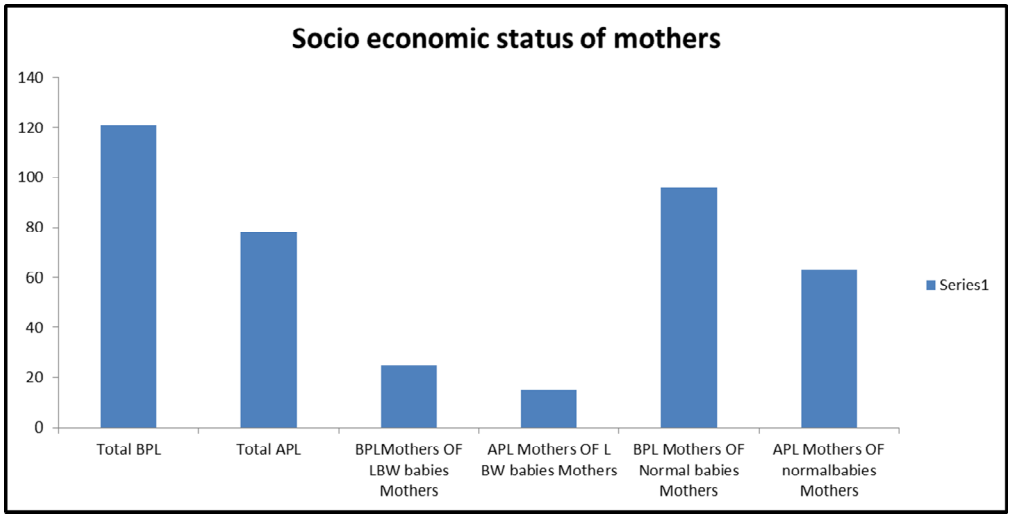


Fig 9

Discussion

The West Bengal is the 4th most populated state with highest density of population. It is a better performing state in respect of health.

Fertility rate (children per women) in West Bengal is 2.3, which is lower than the national average 2.7. The fertility rate highest in Bihar 4.0, lowest in Andhra Pradesh 1.8. Fertility rate has relation with education and health. Women with no education has higher fertility rate that women with education of 2-10 or more years schooling. Similarly women with lowest health have higher fertility than women with more health.

The infant mortality rate in West Bengal is 48 deaths before the age of one year per 1,000 live births. Under 5 mortality rate is 60 deaths per 1000 live birth. These rates imply that 1 in 21 children still die within the first year of life. Infant mortality in rural areas of West Bengal is 19 percent higher than that in urban areas of the state. Children born to mothers under the age of 20 years are much more likely to die in infancy than children born to mothers at older ages. Infant mortality is 68 per 1,000 for teenage mothers, compared with 46 for mothers age 20-29 and 32 for mothers age 30-39. Children whose mothers have no education are almost twice as likely to die before one year of life as children whose mothers have completed 10 or more years of school. Although infant mortality rate in West Bengal is lower than in India 57 per 1000. As a whole, of is higher than 16 other states. The infant mortality rate is highest in Uttar Pradesh 73 per 1000, lowest in Goa 15 per 1000(1).

Parinatal mortality, which includes still births and very early infant deaths (Ist week of life) is 47 deaths per 1000 pregnancy of 7 month or more. Most women in West Bengal receive some antenatal care during pregnancy, but less than 2 / 3rd receive at least 3 ANC Visit andit is high for urban mothers than rural mothers. Only 39% women receive ANC during Ist trimester for their recent birth.

Only about 2 out of every 5 births (42%) in West Bengal take place in a health facility, 3 in 5 births (58%) take place at home. Among urban women and women with 10 or more years education, institutional births exceed 75% of the birth (National Family Health Survey NFHS-3 India, 2005-2006, West Bengal, 2008), International Institute of population Science, Mumbai.

The present study reveals that the younger mothers give birth to more LBW babies than other age groups. Such younger mothers have lowest body weight than others. It is further revealed that the mothers of LBW babies have lower body weight than mothers of normal babies and the difference is significant. The present study further reveals that there is a significant positive correlation between Mothers body weight and LBW babies weights. So from this study it can be said that low body weight of the mother may be one of the maternal risk factor for giving birth to low birth weight babies.

Similarly the mothers of LBW babies Haemoglobin level below 11 gm % and there is positive correlation between Haemoglobin concentration of mothers and LBW babies' weight. So Haemoglobin concentration of the Mother may be another maternal risk factors. The study further reveals (Table III) there are total 98 live male births and 101 female live births so the male female ratio of the live birth is almost 1:1. The trends of female babies in LBW categories are found to be higher than those of male babies.

This study also reveals that most of the mothers have 2-4 anti natal Care visits, other have less than 2 or more than 5 ANC visit. Lesser the ANT visit, higher in the incidence of LBW babies. Similarly lesser the parity higher is the chance of LBW babies.

Known from the present study the LBW babies have lower gestational age than normal babies. Among the LBW babies there are more preterm babies than full term babies. On the other hand for normal birth weight babies there are more full term babies than preterm babies.

Most of the mothers are BPL categories as observed in this study and the mothers of LBW groups are more in number in BPL category.

From this study it is known there are may be several risk factors related to LBW babies birth these are Mothers body weight, low haemoglobin concentration, lower gestational age, lower parity, lower ANC visit and economic status. Lower body weight may be due to congenital mother defects, low nutritional status, low amount of calories intake, more physical activity etc. The anti natal Care provides the iron and folic acid combination to overcome the anaemia. ICDS is also provided to most of the mother as revealed from interviewing the Mother. All the facility help the Mother to overcome the stress of pregnancy to some extend and they require further education, improvement of socio economic status, more health

care facilities, provision and availability. This may reduce the low birth weight in future, improve the infant health status and prevent mortality and morbidity. This will increase the child and Mother survival rate in future. This study is just a sample study made at random choice of this hospital which covers both urban and rural areas and throws light about the real condition of maternal health child birth etc. in a state hospital.

Promotion of maternal and child health has been one of the most important component of the Family Welfare Programme of the Government of India and National population policy - 2000. In 1996 safe motherhood and child health programme (Ministry of Health and Family Welfare, 1997, 1998b).

Despite the national programme for improving maternal and child health in India, maternal mortality and morbidity and child health in India, continue to be high [16]. One of the important reason for this under utilisation or non –utilisation of the maternal health care service due to lack of awareness in rural and slum population in India.

Health care servicing attitude and age and parity of the pregnant women are correlated. According to the study made by Chandhiok *et al*, 2006 there are statistically significant reduction is the proportion of women obtaining ANC services with increasing age, parity and number of living children [17]. According to WHO 1994, most maternal deaths are preventable of pregnancy, delivery and post partum period.

Summary and conclusion

The prevalence of Low birth weight in India is 26%, in the present study it is found to be about 20%. Neonatal mortality is 20 times more likely among Low birth weight babies than those of heavier birth weight babies(>2.5 kg).The present study has identified possible maternal risk factors that may be responsible for Low birth weight and this findings corroborate with observations of similar study conducted elsewhere as revealed from literature.

This study thereby suggests that vigilant monitoring during pregnancy, early detection of maternal risk factors and subsequent management, provision of timely obstetric care intervention, availing of adequate nutrition for mothers, easy access of antenatal care, increasing the level of education and awareness among mothers, family members etc are crucial for reducing both preterm babies and low birth weight babies as far as possible, with a hope for safe motherhood and child survival. In this context the Government is rendering all possible helps on priority basis to curb infant mortality and morbidity in a healthy society.

References

1. WHO (1980) Division of Family Health and the incidence of low birth weight. A critical review of available information. World Health Statistics Quarterly 33,197-224.
2. Siza J.E. Tanzania Journal of Health Research(2008),Vol.10,no.1
3. Klingenberg, C., Olomi, R., Oneko, M., Sam, N. & Langeland, N. (2003) Neonatal morbidity and mortality in a Tanzanian tertiary care referral hospital. Annals Paediatrics 23, 293-299.
4. United Nations children's fund and the World Health Organization, Low birth weight: country, regional and global estimates, UNICEF and WHO, New York and Geneva, 2004, pp.2-3.
5. Labor and delivery - Low Birth Weight" Umm.edu. 2008-10-22.
6. Simhan HN, Caritis SN (2007). "Prevention of Preterm Delivery". New England Journal of Medicine 357 (5): 477–487.
7. Berghella, V. (2007). Prevention of Recurrent Fetal Growth Restriction. Obstetrics and Gynecology, 110(4), 904-912.
8. Goldenberg, R.L., Culhane, J.F. (2007). Low Birth Weight in the United States. American Journal of Clinical Nutrition, 584S-590S
9. Salmasi G, Grady R, Jones J, et al. Environmental tobacco smoke exposure and perinatal outcomes: a systematic review and meta-analyses. Acta Obstet Gynecol Scand. 2010; 89(4):423-41.
10. Pope DP, Mishra V, Thompson L, et al. Risk of low birth weight and stillbirth associated with indoor air pollution from solid fuel use in developing countries. Epidemiol Rev. 2010 Apr;32(1):70-81
11. Lewtas J. Air pollution combustion emissions: characterization of causative agents and mechanisms associated with cancer, reproductive, and cardiovascular effects. Mutat Res. 2007 Nov-Dec;636(1-3):95-133
12. Gochfeld M, Burger J. Good fish/bad fish: a composite benefit-risk by dose curve. Neurotoxicology. 2005 Aug; 26(4):511-20.
13. Matsui T, Matsuno T, Ashimine K, et al. Association between the rates of low birth-weight and/or preterm infants and aircraft noise exposure. Nippon Eiseigaku Zasshi. 2003 Sep; 58(3):385-94.
14. Honein, M.A., et al. (2008). The Association between Major Birth Defects and Preterm Birth. Maternal and Child Health Journal, 12:(4).
15. Karan S, Mathur B, Surender YA et al. Incidence and causesof perinatal mortality at the institute of child health hospital. Ind Paediatr 1972; 99-105
16. Agarwal P. Singh MM. and Garg S. Maternal Health Care utilisation among women in urban slum in Delhi. Indian Journal Community medicine 2007, 32: 203-205.
17. Chandhiok N. Dhillon B.S. Kambox I and Saxena NC. Datermination of antenatal care utilisation in rural area of India: A cross sectional study from 28 districts –An ICMR task force study, Journal of obstetrics and Gynecology of India, 2006, Vol.56 No 1: 47-52.