

TO STUDY THE CHANGING TREND IN THE INCIDENCE OF LOW BIRTH WEIGHT, PERINATAL ASPHYXIA, SEX RATIO AT BIRTH & MODE OF DELIVERY IN A RURAL MEDICAL COLLEGE OF WEST BENGAL OVER LAST FOUR DECADES

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ABSTRACT

BACKGROUND

The birth weight of an infant is the single most important determinant of its chances of survival, healthy growth & development. Over the past four decades, a number of health programmes regarding newborn & child health care have been implemented in India which has led to decline in neonatal & infant mortality rate, better sex ratio & increased number of institutional deliveries.

This study was conducted in department of Paediatric Medicine of North Bengal Medical College to assess the decadal trend in incidence of LBW and perinatal asphyxia, changes in sex ratio & mode of delivery.

AIM & OBJECTIVE

To study the changing trend in the incidence of low birth weight, perinatal asphyxia, sex ratio at birth & mode of delivery in a rural medical college of West Bengal over last four decades.

MATERIAL & METHODS

A retrospective longitudinal hospital based study was conducted in Department of Paediatric Medicine at North Bengal Medical College over last four decades. From this retrospective record, birth weight of the babies, APGAR score at one & five minutes, mode of delivery & female: 1000 male ratio was obtained.

RESULT & CONCLUSION

It was found that the incidence of LBW had was initially high (32.7% in 1986-87) but gradually declined to 26.4% in 2014-15. Incidence of birth asphyxia overall decreased from 17.2% in 1985-86 to 15.6% in 2014-15. Sex ratio at birth has gradually improved from 927 in 1986-87 after the implementation of Preconceptional prenatal diagnostic Act. In 2014-15, it was 934 females per 1000 male births; however, incidence of caesarean sections increased from 15.3% in 1976-77 to 44.7% in 2014-15.

KEYWORDS

Low birth weight, CS, Perinatal asphyxia.

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INTRODUCTION: Any national development strategy that emphasises human development essentially begins with the welfare of children. Planners all over world have recognized that access to minimum services for children is likely to ensure their optimal development and would help them into shaping adults capable of contributing to economic and social development of nation. Keeping this in mind, Government of India established Central Social Welfare Board in 1953 to promote child welfare and development with the aid of voluntary organization. But the isolated advertisement fragmented services failed to address the

problems of children of India. A comprehensive national policy for child welfare was needed and as a result of this, National Policy for children was adopted in 1974. On 2nd October 1975, the country's largest programme was launched for welfare of children named as Integrated Child Development Services. Over the years, it has grown into one of the largest integrated family and community welfare schemes in the world.⁽¹⁾

Following ICDS, a number of strategies and plans were developed and implemented. In 1992, Child Survival and Safe Motherhood Programme was launched to promote institutional deliveries and better newborn care, followed by Reproductive and Child Health Programme (RCH-1) and RCH-2 in 1997. NRHM was launched in 2005, RMNCH+A in 2013, keeping newborn health as centre stage. To reduce the preventable newborn deaths and stillbirths, Indian Newborn Action Plan was adopted in 2014. New initiatives like Janani Shishu Surakhsha Karyakram (JSSK), Navjat

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Shishu Surakhsha Karyakram (NSSK), Rashtriya Bal Swasthya Karyakram (RBSK) had been launched to provide free delivery services, free investigations, free medicines for the newborns.

These initiatives especially NRHM and RCH have been very successful in lowering down the incidence of LBW as well as neonatal mortality rate. To assess the evolution of newborn and child health care of North Bengal region of West Bengal, this study was conducted in North Bengal Medical College and Hospital (NBMCH). It is a rural tertiary care centre located in Sushrutanagar, about 10 kilometres from Siliguri but well connected to other parts of India and neighbouring countries by rail & road. Established in 1972, it caters health care services to a large number of patients from surrounding districts, neighbouring states and countries.

Following parameters were included in the study- incidence of low birth weight, perinatal asphyxia, sex ratio, and mode of delivery. Birth weight is the most important because it is the single most determinant of its survival, healthy growth and development.

A low birth weight is defined as birth weight less than 2.5 kg irrespective of the age of gestation, taken preferably in the first hour of life.⁽²⁾ Infants weighing less than 2.5 kg are 20 times more likely to die than the heavier babies.⁽³⁾ The current incidence of low birth weight is 28/100.⁽⁴⁾

About one quarter of neonatal deaths in India are due to perinatal asphyxia.⁽⁵⁾ A gold standard of birth asphyxia does not exist. It is better to use the term perinatal asphyxia because asphyxia can occur in utero and in postnatal period.

WHO defined perinatal asphyxia as "failure to initiate or sustain breathing at birth".⁽⁶⁾ The National Perinatal Database 2000 uses similar definition for perinatal asphyxia. It defines moderate asphyxia as slow gasping breathing or an APGAR score of 4-6 at 1 minute of age and severe asphyxia as no breathing or APGAR score of 0-3 at 1 minute, or APGAR score <7 at 1 minute.⁽⁷⁾ Therefore, significant attention towards the prevention of birth asphyxia is required.

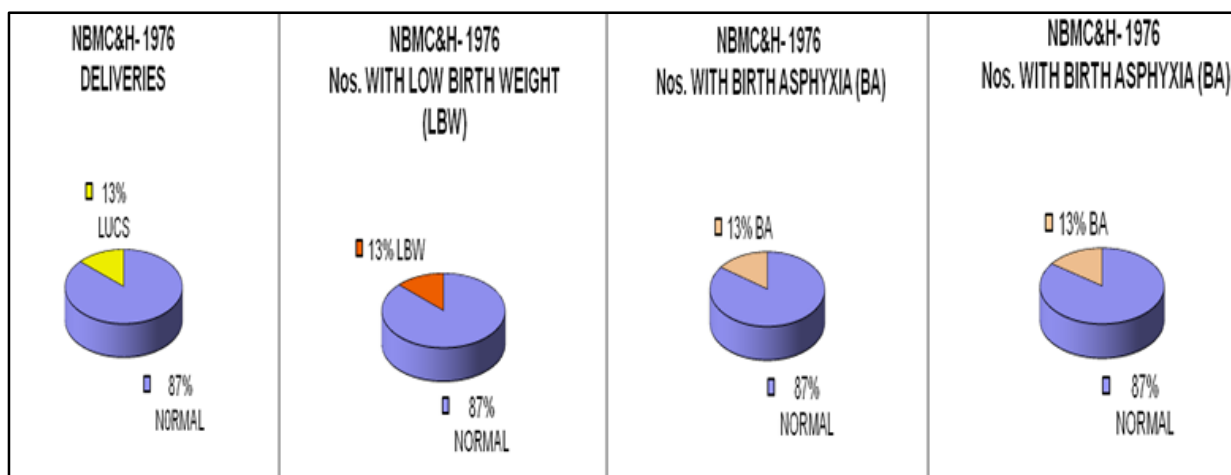
Sex ratio at birth is defined as number of females per 1000 males. The gradually increasing number of female foeticide has been a major concern. The male-female ratio showed a downward trend from 946 in 1951 to 927 in 1991. The Preconceptional Prenatal Diagnostic Act passed in 1994 banned sex determination and thereby decreasing the female foeticide. At present, the ratio is 940(2014).⁽⁴⁾ The growing number of institutional deliveries has also increased the number of caesarean sections performed.

MATERIALS AND METHODS: This is a retrospective, longitudinal hospital based study conducted in NBMCH. It includes all the deliveries conducted in NBMCH during the years 1976-77, 1986-87, 1996-97, 2006-07, 2014-15. All babies less than 2.5 kg were taken as low birth weight. All babies whose APGAR score was less than 7 at 1 minute were included in the study. The number of female live births per 1000 male live births was recorded. The number of caesarean sections was also taken into account.

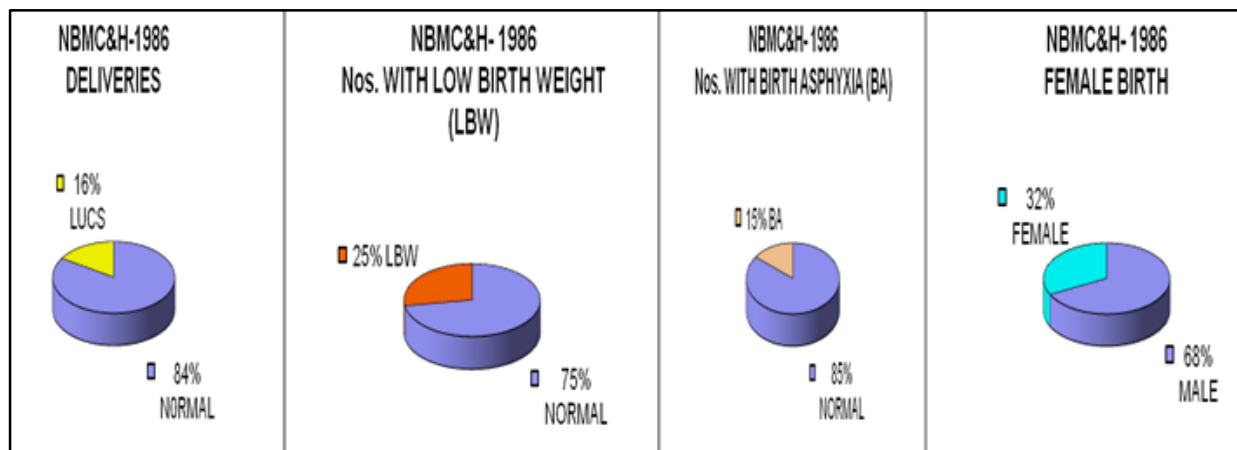
Year	No. of Deliveries	No. of LBW	No. of Birth Asphyxia	Sex Ratio	No. of LUCS (%)
1976-77	366	54(14.7%)	65(18%)	920	56(15.3%)
1986-87	1162	392(33.7%)	200(17.2%)	927	224(19.2%)
1996-97	3344	1232(36.8%)	521(15.6%)	916	965(28.8%)
2006-07	5786	1523(30.4%)	616(12.3%)	926	1608(32.1%)
2014-15	7038	1647(26.4%)	1097(11.4%)	934	3145(44.7%)

Table 1

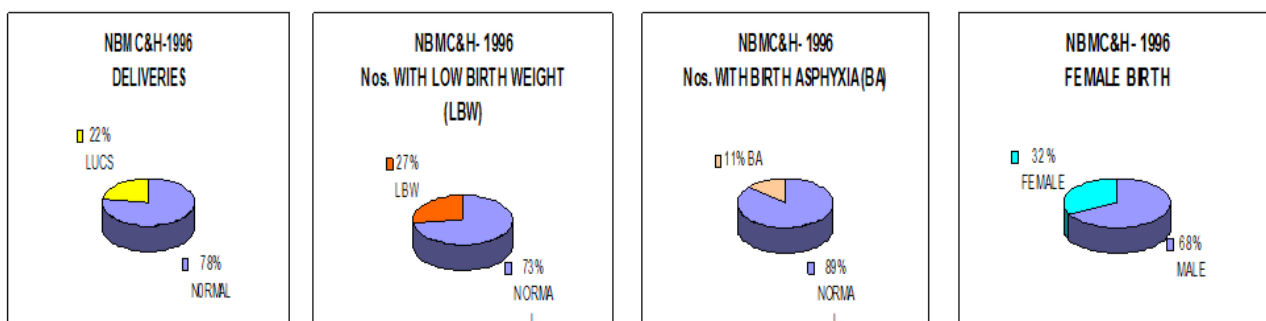
RESULT: The study was conducted from the year 1976-77(1.7.76 to 30.6.77) & then on 1986, 1996, 2006 & 2014. In 1976-77 the number of deliveries at NBMCH was minimal, only 366, out of which only 56(15.3%) mothers had caesarean sections and 54(14.7%) babies were LBW. Incidence of perinatal asphyxia was 65(18%) and female per 1000 male babies were 920.



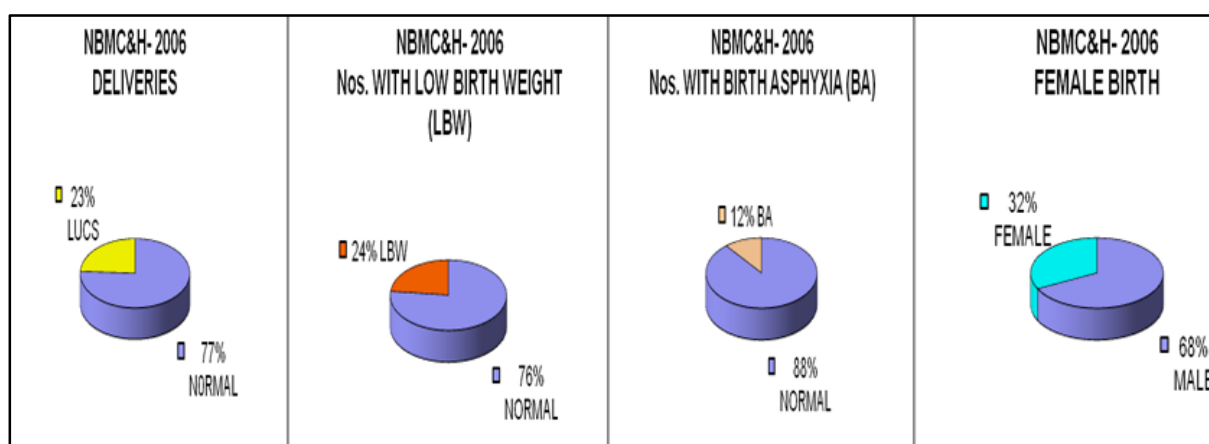
Subsequently, next decade in 1986-87, number of mothers for delivery at NBMC&H increased to 1162 with 224 (19.2%) number of caesarean sections & 392 (33.7%) of LBW babies; however, perinatal asphyxia in babies increased to 200(17.2%), sex ratio remained almost same 927 per 1000 male babies.



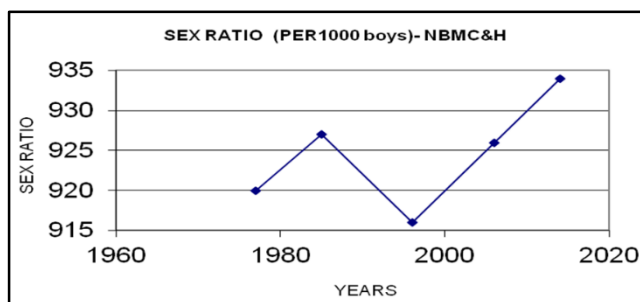
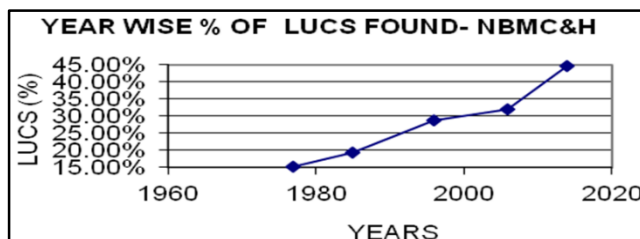
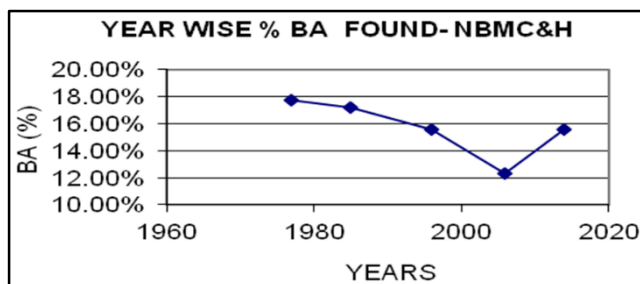
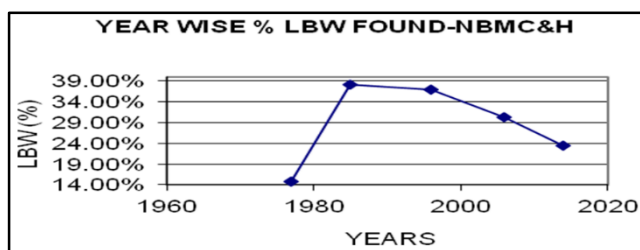
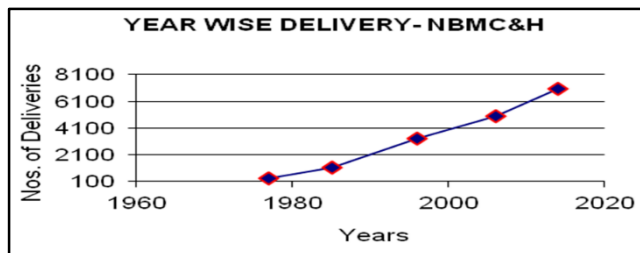
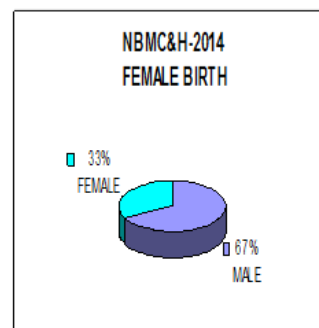
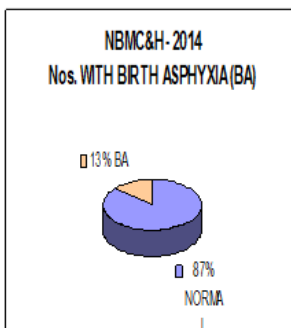
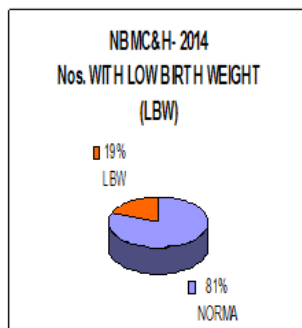
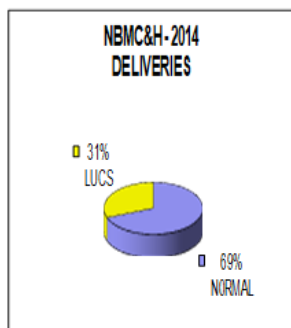
In 1996-97, delivery rate finally increased to 3344 with caesarean sections in 965(28.8%), in which LBW was high 1232(36.8%) and number of asphyxiated babies were 521(15.6%), 916 female babies were born per 1000 male.



In 2006-07, there was further increase in the total deliveries (5786) with increase in caesarean sections 1608(32.1%). However, LBW babies started showing decreasing trend 1523(30.4%) but many of them had perinatal asphyxia 616(12.3%), improvement was also found in sex ratio 926 per 1000 male babies.



In 2014, 7038 number of deliveries were conducted at NBMC&H with marked increase in caesarean sections 3145(44.7%). LBW babies were much less i.e. 1647(26.4%) but incidence of perinatal asphyxia remained more or less the same i.e. 1097(11.4%). Sex ratio improved from before 934 per 1000 male babies.



DISCUSSION: Low birth weight is an important cause of neonatal mortality. The incidence of low birth weight babies varies widely. In this study, incidence of low birth weight babies has decreased gradually from 33.7% in 1986-87 to 26.4% in 2014-15. Similar study in Hooghly district of West Bengal has showed 28.8% occurrence of low birth weight.⁽⁸⁾ It is in accordance with the current incidence of low birth weight in the state which is 27/100 live births.⁽⁹⁾ This improvement is attributed to better socioeconomic status of the mother, better antenatal checkup. The significant low incidence in 1977 can be explained by the low awareness among people for institutional deliveries, poor communication system in the area during that period. Among those who sought for hospital deliveries, many belong to upper socioeconomic strata and were among staff of NBMCH and North Bengal University.

Perinatal asphyxia is another major cause of infant death. Its incidence has decreased progressively from 18% in 1976-77 to 11.4% in 2014-15. The incidence of birth asphyxia in developing countries is 12-16%⁽¹⁰⁾ while in developed countries it is 1-1.5%.⁽¹¹⁾ The incidence is much higher in comparison to the other studies conducted in India by Vijai Anand Babu et al(6.6%)¹² and Paul VK et al(5.6%).¹³ The trend reflects improvement in safe delivery practices and increase in number of institutional deliveries. Since birth asphyxia accounts for nearly 20% of neonatal deaths, further training and strengthening of programmes are required to bring down the incidence.

The total number of caesarean sections has increased to 44.7% as compared to 15.3% back in 1976-77. The increase can be explained by increase in number of multiple pregnancies, better foetal monitoring techniques and better socioeconomic status of the mother who prefer to opt for painless child birth. However, further studies are required to find out the actual cause.

Sex ratio at birth is defined as ratio of female live births per 1000 male live births. A sex ratio at birth which lies between 934 and 952 females per 1000 male births is considered to be within normal range, based on observation over several decades for many countries.⁽¹⁴⁾ Sex ratio has also improved over the decades from 920 in 1976 to 934 in 2014 which is better than the nation's average. According to 2011 census, sex ratio is 940 while child sex ratio (defined as total number of girls per 1000 boys in 0-6 years age group) is 914.⁽²⁾ The introduction of Preconceptional Prenatal Diagnostic Techniques Act in 1994 has helped in control of female foeticide and improvement of sex ratio.

CONCLUSION: The health status of community has improved over years as indicated by decreasing trend of low birth weight and birth asphyxia but still further improvement is required. Early diagnosis and prompt referral of high risk pregnancies, further training of health personnel in safe delivery practices and newborn resuscitation, strengthening of existing programmes and better communication system will help in upliftment of health status of people especially in rural and peripheral areas.

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REFERENCES:

1. World health organization. International statistical classification of diseases and related health problems, tenth revision, World Health Organization, Geneva, 1992.
2. Kramer MS. Determinants of low birth weight: methodological assessment and meta-analysis. *Bulletin of the World Health Organization* 1987;65(5):663–737.
3. World health organization. Low birth weight: a tabulation of available information. WHO/MCH/92.2, World Health Organization, Geneva and UNICEF, New York, 1992.
4. www.censusindia.gov.in.
5. Park's textbook of preventive and social medicine. 2015;23rd edition:565.
6. World health organization. Perinatal mortality: a listing of available information FRH/MSM. 96.7, Geneva:WHO 1996
7. Report of the national neonatal perinatal database (National Neonatology Forum, India) 2000.
8. Dasgupta A, Basu R. Determinants of low birth weight in a block of Hooghly, West Bengal: a multivariate analysis. *Int J Biol Med Res* 2011;2(4):838–842.
9. National family health survey 4 report, West Bengal factsheet. www.rchiips.org
10. Bhargava SK, Singh KK, Saxena BN. Report of the national collaborative study of high risk families, mothers and outcome of their offspring's with particular preference to the problem of maternal nutrition, low birth weight, perinatal and infant morbidity and mortality in rural and urban slum communities. New Delhi. ICMR 1990.
11. Snyder EY, Cloherty JP. Manual of neonatal care. 2012;7th edition:711-26.
12. Vijai Anand Babu B, Shyamala Devi S, Kishore Kumar B. Birth asphyxia- incidence and outcome in relation to risk factors complications. *International Journal of Research in Health Sciences* 2014;2(4):1064-1071.
13. Paul VK, Meharban Singh, Sundaram KR, et al. Correlates of mortality among hospital born neonates with birth asphyxia. *The National Medical Journal of India* 1997;10(2):54-57.
14. Chahnazarian A. Determinants of sex ratio at birth: review of recent literature. *Social Biology* 1988;35(3-4):214:235.