A cross sectional study on assessing the prognosis of low birth weight babies delivered at CEmONC, Jabugam, Gujarat since April 2013 to March 2017

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Abstract:

Introduction: Weight of a baby at term depends on gestational age and rate of fetal growth in uterus. Babies born may be appropriate for gestational age but are small because of preterm delivery.

Material & Method: A retrospective descriptive cross-sectional study was conducted in the month of July 2017 at CEmONC, Jabugam Pavi Jethpur Taluka, Chhota Udepur district in Gujarat. In which 2170 low birth weight babies born at CEmONC Jabugam between April 2013 to March 2017 were included in the study.

Results: In this 348 children born were alive and healthy, 12 were alive with morbidity like Hydroencephalus, Asthama, infection, 10 were alive with disability like deafness, deformed arms and limbs & 46 died. Children who died were in the range between < 1kg to 1- 1.5kg. Poor birth weight is the main cause of death among children.

Conclusion: Educating the mother about nutrition, proper breast feeding technique & taking care of the child and herself can be useful. Developmental delay is seen in early ages of children, it declines as the age advances.

Keywords- *Low birth weight, Development delay.*

Introduction

Weight of a baby at term depends on gestational age and rate of fetal growth in uterus. Babies born may be appropriate for gestational age but are small because of preterm delivery. Babies who are small for gestational age may be born preterm or term. A baby is said to be small for gestational age when the gender specific birth weight is below the 10^{th} percentile for the appropriate gestational age. More than 70% of these Low Birth Weight (LBW) babies are small due to constitutional and environmental factors. Small for gestational age may be due to pathological reasons when it is called as intra uterine growth restriction. Depending upon birth weight and gestational age, WHO categorizes babies in three groups, Small for gestational age, Appropriate for gestational age and Large for gestational age. Depending upon these criteria, LBW baby is defined as baby having a weight less than 2.5kg within 24 hours of birth. This group of babies has contribution in high perinatal mortality and morbidity. Our objectives were to study the contributing factors like socio-economic status, education , occupation for low birth weight babies delivered at CEmONC , Jabugam since April'13 to March'17 and to assess the relationship between LBW and achievement of motor , sensory and neurological development of child.

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Material & Method

A retrospective descriptive cross-sectional study was conducted in the month of July 2017 at CEmONC, Jabugam Pavi Jethpur Taluka, Chhota Udepur district in Gujarat. In which 2170 low birth weight babies born at CEmONC Jabugam between April 2013 to March 2017 were included in the study.

Inclusion criteria:

1. Singleton pregnancy
2. Birth weight <2.5kg

Exclusion criteria:

1. Women with multiple pregnancies
2. In-utero death
3. Still birth.

Sample design:

Samples were selected from the entire list of low birth weight deliveries which have taken place at Jabugam CEmONC since April 2013 to March 2017. Respondents were contacted till the sample size was achieved.

Sample size: $Z^2 *(p)*(1-p)/c^2$

The prevalence of low birth weight child born in India is 20%. Therefore, sample is calculated by above formula with confidence level of 95% & margin of error of 5%, It comes out to be 327. Considering the non-response rate (30%) the sample was increased to 417.

Study conduct:

The study was conducted at Deepak foundation, Vadodara. The details of the subjects were collected from CEmONC hospital at Jabugam & the subjects were asked the questions telephonically in local language with the help of a translator until the desired sample size was achieved.

Tool:

- A close ended schedule through which questions was asked in local language.
- For developmental delay: A modified health survey assessment schedule was used to assess the developmental milestone status achieved. The tool consists of month wise categorization of children from 0-3 months to 4 years. In each category it had questions about cognitive, motor, sensory, communication & feeding milestones. The child was given scores accordingly on the basis of completion of the desired activity in that period of time.

Analysis: Analysis of the data collected was done by MS- EXCEL & SPSS

Significance of the study:

- This study will help to determine the current status of low birth weight babies at Jabugam CEmONC.
- The treatment and care required for low birth weight babies
- Treatment of the disabilities which commonly occur in Low birth weight children.
- Education of women and people can bring about a lot of difference in the current scenario. They should be taught how to maintain good health during pregnancy which can be done by ASHA's & other health care volunteers.
- Importance of ANC & PNC- which should be made mandatory for all women & this can be done with the help of ASHA's
- Community based Management is required for improving the health of mother as well as the child.

Limitations of the study:

- Improper data records & documentation
- Respondents were not willing to give their response
- Majority of them are only primary educated, so they were not able to respond accurately
- Recall bias
- Language was the most important barrier during data collection

Results

Table 1. Low birth weight Vs Preterm (N= 417)

Number of LBW		Male		Female		Total
Delivery	N	%	N	%	N	%
FTND	143	73.7	176	78.9	319	76.50%
PTND	51	26.3	47	21.1	98	23.50%
Grand Total	194	100	223	100	417	100.00%

Table 2. Current Health Status of children (N= 417)

Live Status	Male		Female		Total	
	N	%	N	%	N	%
Alive & healthy	155	79.9	193	86.5	348	83.5%
Alive with morbidity	4	2.1	8	3.6	12	2.9%
Alive with disability	5	2.6	5	2.2	10	2.4%
Dead	30	15.5	16	7.2	46	11.0%
Alive with morbidity & disability		0.0	1	0.4	1	0.2%
Grand Total	194	100	223	100	417	100.00%

Table 3. Age of child at death Vs Birth weight (N=46)

Age at time of death	< 1 kg		1 - 1.5 kg		1.5-2.5 kg		Total	
	N	%	N	%	N	%	N	%
< 7 days	4	23.53	4	23.53	9	53.00	17	100.00
8 days – 28 days	00	0.00	8	47.06	9	52.94	17	100.00
1 month – 3 month	00	0.00	2	33.33	4	66.67	6	100.00
7 month – 1 year	00	0.00	1	20.00	4	80.00	5	100.00
1 – 2 year	00	0.00	1	100.00		0.00	1	100.00
Grand Total	4	8.70	16	34.78	26	56.52	46	100.00

Table 4. Reported cause of death of children (N= 46)

Death by cause	Male		Female		Total	
Cause	N	%	N	%	N	%
Due to disease	8	26.7	3	18.75	11	23.91
Due to deformity	0	0	1	6.25	1	2.17
Poor Birth Weight	22	73.3	12	75	34	73.91
Grand Toral	30	100	16	100	46	100.00

Table 5. Age group of mother Vs LBW (N= 417)

Age group of Mother	< 1kg		1 - 1.5kg		1.5-2.5kg		Total	
	N	%	N	%	N	%	N	%
<19 yr	1	1.35	6	8.11	67	90.54	74	100.00
19-25 yr	3	1.17	15	5.86	238	92.97	256	100.00
26-30 yr	0	0	2	2.99	65	97.01	67	100.00
>30 yr	0	0	2	10.00	18	90.00	20	100.00
Grand Total	4	0.96	25	6.00	388	93.05	417	100.00

Table 6. Income Group Vs LBW (N=417)

Income (rs)	< 1 kg		1 - 1.5 kg		1.5-2.5 kg		Total	
	N	%	N	%	N	%	N	%
5000-15000	4	0.01	24	0.06	359	0.93	387	100
15000-25000	0	0.00	1	0.04	24	0.96	25	100
25000-3000	0	0.00	0	0.00	5	1.00	5	100
Grand Total	4	0.01	25	0.06	388	0.93	417	100

Table 7. Education of mother Vs LBW child (N= 417)

Education	< 1 kg		1 - 1.5 kg		1.5-2.5 kg		Total	
	N	%	N	%	N	%	N	%
Illiterate	1	1.3	8	10.4	68	88.3	77	100.0
Literate but without formal schooling	1	2.1	1	2.1	46	95.8	48	100.0
Primary (1-7 std.)	2	1.3	9	5.7	148	93.1	159	100.0
Seconday (8-10 std.)	0	0.00	5	5.1	94	94.9	99	100.0
Higher seconday (11-12 std.)	0	0.0	2	6.9	27	93.1	29	100.0
Diploma	0	0.0	0	0.0	3	100.0	3	100.0
Graduate	0	0.0	0	0.0	2	100.0	2	100.0
Grand Total	4	0.9592	25	5.9952	388	93.046	417	100.0

Table 8. Occupation of mother Vs LBW child (N= 417)

Occupation	< 1 kg		1 - 1.5 kg		1.5-2.5 kg		Total	
	N	%	N	%	N	%	N	%
Unemployed		0.0	2	33.3	4	67	6	100.0
Cultivation	1	1.4	6	8.5	64	90	71	100.00
Farm Labor	1	0.6	8	5.2	145	94	154	100.0
Other Labor	1	2.0	3	6.0	46	92	50	100.0
Service		0.0		0.0	7	100	7	100.0
Business	1	0.8	6	4.7	122	95	129	100.0
Toral	4	1.0	25	6.0	388	93	471	100.0

Table 9. Development rate (N=417)

Age group	Max score	Score achieved		Not achieved	
		N	%	N	%
3 - 6 months n= 34	5	28	82.35	6	17.65
6- 9 months n= 65	10	24	36.92	41	63.08
9-12 months n= 53	15	24	45.28	29	54.72
1- 2 year n= 70	20	33	47.14	37	52.86
2-3 year n= 36	25	16	44.44	20	55.56
3- 4 year n= 111	25	60	54.05	51	49.95

Discussion:

The early and long-term effects of premature birth on the physical and psychological growth and development of the child are subjects of considerable current interest. Most studies have indicated that in early childhood the preterm children show significant delay in many areas of physical and psychological growth and development. Although 'catch-up' growth has been reported in later childhood, some studies have indicated that long-term delays into adolescence may occur. [2].These problems range from severe handicap such as cerebral palsy, cognitive impairment, and blindness and hearing loss to impairment of short term memory, strabismus, language delays, learning difficulties and behavioral disorders. Individual children often have multiple disabilities and these handicaps persist into school going age and beyond. There is concern that improved rates of survival of very low birth weight (VLBW), and particularly extremely low birth weight (ELBW) infants, may be associated with increased rates of neuro developmental handicap, although some report improved survival without increased handicap. [3] The reasons why low birth weight or other adverse outcomes of pregnancy should be associated with events in later life are unclear. It has been hypothesized that aetiological processes in the development of cardiovascular disease, obstructive lung disease, and diabetes, are initiated early in life, therefore fixing a person's risk before other risk factors are encountered, or that birth weight or infant growth act as markers for other causal factors experienced both in childhood and later in life. That social factors can affect low birth weight and other adverse pregnancy outcomes is neither new nor a revelation.

Conclusion

- The low birth weight children born at CEmONC, Jabugam is around 93%, Very low birth weight is 6% & Extreme low birth weight is 0.96%.
- In this 348 children born were alive and healthy, 12 were alive with morbidity like Hydroencephalus, Asthama, infection, 10 were alive with disability like deafness, deformed arms and limbs & 46 died.
- The maximum number of deaths occurred between 7 days to 28 days.
- Children who died were in the range between < 1kg to 1- 1.5kg.
- Poor birth weight is the main cause of death among children.
- Maternal age is an important factor in determining child's weight, above 30years chances of having Very low birth weight child increases.
- Family income is also an important in determining child's weight, in low income group families maximum number of low birth weight children can be seen.
- Educating the mother about nutrition, proper breast feeding technique & taking care of the child and herself can be useful.
- Developmental delay is seen in early ages of children, it declines as the age advances.

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