HEALTH CONSEQUENCES OF LOW BIRTH WEIGHT IN ETHIOPIA

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Health Consequences of Low Birth Weight In Ethiopia

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SUMMARY

An historical cohort of 116 low birth weight (LBW) and an equal number of normal birth weight (NBW) children between 1 and 40 months of age who were delivered in the Jimma Regional Hospital were assessed in terms of their nutritional status and morbidity history. In this record linkage of hospital and community based study, exposure variables of birth weight and birth length were obtained from the hospital data base. Prenatal exposures, categorized as socio- demographic and obstetric risk factors were obtained by interviewer administered questionnaire to mothers, along with the current health and nutritional status of the children.

The study revealed significant higher risks in LBW children for current morbidity of 2.02 (1.1, 3.7) and frequent illness of 6.0 (2.3, 15.9). Comparison of nutritional status showed 65% of the LBW and 46% of NBW children to be malnourished with a relative risk of 2.2 (1.24 - 1.36).

It is concluded that LBW are at increased risk for morbidity and malnutrition in early childhood.

I. INTRODUCTION

Of all fetal anthropometric measurements or their combinations birth weight has received the greatest attention over the last fifty years. Available historical data on its utility date back 300 years. Aside from its clinical utility, birth weight has been used as a social and health status indicator, a predictor of subsequent morbidity and mortality, and currently as one of the evaluative and comparative indicators for the attainment of health for all by the year 2000 (1).

The present state of knowledge has solidly established the inverse relationship between birth weight and infant mortality. Birth weight is probably the single most important factor in affecting neonatal mortality and a significant determinant of post-neonatal infant mortality as well as infant and later childhood morbidity (2).

Several studies have iteratively demonstrated that low birth weight does not occur randomly within a population. Rather its distribution follows a disproportionate pattern. It occurs more frequently in lower socio-economic groups, in malnourished mothers, in maternally depleted multiparas, in very young primiparas; in newborns with short birth intervals, and in first and high birth orders (3).

The prevalence of low birth weight (LBW) is difficult to estimate for Ethiopia. Taking the crude estimate of 10-20% as reported by the World Health Organization (WHO)(4), the problem

is clearly of public health significance. Most of the known risk factors for the occurrence of low birth weight are highly prevalent throughout Ethiopia. Similarly, figures are high for infant and childhood mortality and morbidity which are closely related to low birth weight. However, this relation has not been systematically studied in an Ethiopian population. The limited number of Ethiopian publications have focused primarily on specific risk factors related to low birth weight and on its distribution pattern among hospital delivered neonates (5,6,7). As to what happens to LBW infants in their post-natal life, this has been insufficiently studied in Ethiopia.

This study was thus designed to investigate outcomes of LBW within the specific context of an Ethiopian region in terms of mortality, morbidity and physical growth. Risk factors during pregnancy potentially associated with LBW were also explored. It is anticipated that the results of this study will further our understanding of the consequences of LBW in the context of a developing country. It is hoped the findings will help identify infants at elevated risk for mortality and morbidity and promote more growth monitoring activities, thereby strengthening the MCH component of PHC programmes.

The objectives of the present study were as follows:

1. To examine nutritional status and morbidity outcomes of LBW children.
2. To quantify the level of risks for morbidity and malnutrition in LBW children, relative to normal birthweight children.

3. To identify prenatal maternal characteristics, socio-demographic, and birth history predictors of morbidity and nutritional status.

II. STATE OF KNOWLEDGE

A. DEFINITION

In 1949 WHO defined prematurity as a birth weight of less than or equal to 2500 gm . Later when it became accepted that not all neonates of 2500 gm or less are premature, the designation low birth weight (LBW) was applied to them instead (8). This necessitated a redefinition of prematurity (by WHO) to include infants with birth weight of 2500 gm or less and who were born prior to 37 weeks of gestation. Based on the criteria of weight and gestation age, other categories have been designated for LBW newborns: term small for gestational age (T-SGA), preterm small for gestational age (pre SGA), preterm appropriate for gestational age (pre AGA), and very low birth weight (VLBW).

Recently LBW has been subdivided into two broad etiologic categories; prematurity and intrauterine growth retardation (IUGR). Currently IUGR is understood to encompass two distinct entities, so-called type I (symmetrical or stunted)and type II (asymmetrical or wasted) IUGR (9). Each sub-category is associated with different risk factors, and each implies different risks for mortality and morbidity (9,10).

In developing countries health facilities often lack the diagnostic capability to differentiate IUGR from prematurity. Additionally, mothers do not know their gestational dates. Nonetheless, in studies of LBW from developing countries it can be assumed the large majority will be due to IUGR, which is not

the case in developed countries (11).

One important problem in comparing LBW studies is the use of varied definitions of LBW. The present study is an assessment of children who were born at term but were small for gestational age (2500 gm or less), presumeably as a result of IUGR.

B. RISK FACTORS OF LOW BIRTH WEIGHT

1. Socio-demographic variables

Illsley and Mitchell reviewed several studies relating birth weight to a number of social variables (3). They made special reference to the study of Boldman and Reed, a study of indicator variables across 21 countries, where 70% of all the observed variation could be explained by the single variable of per capita income. The authors cautioned against the interpretation of etiological significance for variables that may show positive correlation with birth weight. They claimed that some of the correlations are spurious and that most of the individual correlations are reduced to insignificance when one controls for income.

Based on 1983 data collected from most states of the United States, Kleinman et al. reported that age, marital status and education influenced the occurrence of low birth weight in varying degrees. Maternal education had the strongest effect, especially on the birth weight category 1500-2500 gm (12).

In their study of socio-economic status and the incidence of low birth weight among the Bariba of Benin, West Africa, Sargent

and colleagues reported lower proportions of low birth weight among high when compared to low social classes. They attributed the difference not to a nutritional risk (unlike many studies) but rather to access of the higher class to malarial prophylaxis (13). In a study conducted on Zimbabwean urban women, socio-economic status (defined by stated income) showed no statistically significant difference between LBW mothers and their normal birth weight controls (14). The same study revealed no significant difference for physical activity defined as 'light' and 'heavy' work, based on subjective answers of mothers.

A study conducted in Ethiopia has reported excessive maternal physical activity during pregnancy to be one factor in the etiology of low birth weight, particularly where maternal dietary intake is border line (5).

2. Obstetric Variables

In their synthesis of studies concerning maternal weight as a risk factor, Garn and his colleagues (15) tried to explain the 'parity effect' (i.e. LBW being more frequent among multiparas) on the basis of pre-pregnancy weight gain. Whether inadequate weight gain is a valid explanation for all levels of parity is not clear. The teenage effect (i.e. LBW being more frequent among teenagers) was also similarly explained in terms of insufficient prepregnancy maternal weight especially, for the under 15 year-old mothers.

In an effort to examine the individual contribution of different risk factors to birth weight, Keller (8) conducted a

multiple regression analysis on data collected in a perinatal investigation. He found pre-pregnancy weight, last prior birth weight, and previous pregnancy outcomes to be among the most important factors predicting birth weight. Interestingly age, parity, and income did not independently explain much of the variance. Conversely, a study in Thailand (16) reported a significant increase in parity among women delivering a LBW newborn. This was true for rural as well as urban women. In Katsina, Northern Nigeria, Osuhor (17) reported high rates of LBW among primiparous women.

C. CONSEQUENCESS OF LOW BIRTH WEIGHT

1. Morbidity

In both developed and developing countries an infant's birth weight is probably the single most important factor affecting neonatal mortality and is a significant determinant of post-neonatal infant mortality as well as infant and later childhood morbidity (2).

Arora et al. studied neonatal morbidity in 100 term IUGR newborns and a similar number of controls in New Delhi, India (18). He reported a significant difference between the two groups in the incidence of birth asphyxia. In this study hypoglycemia was also significantly more common in the IUGR newborns. In an initial report of a 10 year birth cohort follow-up study in Aberdeen, Scotland it was found LBW infants had an increased incidence of neonatal problems irrespective of maternal

history and experience (19).

2. Nutritional status

Kramer and colleagues in their review of the literature, concluded that IUGR infants are more likely to have deficits in growth that appear to be permanent (2). A study in Tanzania drew the same conclusions (20). Yet inconsistent findings are reported in the literature concerning the relation between birth weight and subsequent post-natal growth, thus placing in question the previously cited findings (21).

Garn et al. (15) reported that small-for-date infants of low prepregnancy weight mothers remain considerably smaller through the early school years and beyond, while the small-for-date infants of high weight and obese mothers seem to catch up and closely approximate the total population in size and weight. The same authors reported the apparent 'channelization ' (tracking towards the 50th percentile), with the full range of percentiles from the 5th to the 95th remaining distinguishable from birth through 7 years of age. They concluded that size at birth is an important determinant of size through the early school years, at least.

In summarizing their main finding at the 10 year follow-up, Illsley and Mitchell found children who had a birth weight of 2500 gm or less to be, at age 10, lighter and shorter and to have smaller heads than their controls. However, as they noted, the differences were small (3). These relations have not been adequately studied among developing African populations.

III. METHODS AND MATERIALS

Study Domain

Jimma, the study area, is a developing regional capital town in South-West Ethiopia. It has a population of about 60,000 and, as with other developing towns, the age-sex pyramid is broad-based with a tapering apex. Health indicators include a crude birth rate (CBR) of 43 per thousand, crude death rate (CDR) of 18 per thousand live births, and infant mortality rate (IMR) of 92 per thousand live births.

Jimma town is divided into twenty health units corresponding to socio-administrative divisions known locally as 'kebeles'. Each unit is served by one community health post (CHP), with at least one community health agent (CHA) and one trained traditional birth attendant (TTBA). Besides other health activities, these community health workers attend about 50% of all home deliveries (ie 25% of all deliveries in the town). The town is also provided with one MCH clinic, one health centre and one regional hospital. About 50% of mothers in the town are estimated to deliver in the regional hospital and it is from this hospital that the study subjects were identified.

Study Design

An historical cohort study of LBW and an equal number of normal birth weight children was conducted to investigate outcomes of low birth weight in terms of current nutritional

status and morbidity.

Population

Source Population: Figure 1 summarizes the study design, inclusion/exclusion criteria and the selection hierarchy. The source population from which the study subjects were derived consisted of approximately 2200 Jimma regional hospital delivered children between the dates September, 1985 to December 1988 G.C and their mothers. Entry into the cohort was defined as any term ($\geq$ 37 weeks) live birth at Jimma regional hospital between these dates.

Study Population: Entry into the cohort was defined on the basis of birth weight. All newborns weighing 2500 gm or less were identified. Those who were delivered traumatically (forceps, caesarian section) were excluded. Each of the remaining was then matched with a newborn weighing more than 2500 gm (normal birthweight or NBW) delivered just before or after the index case.

From the defined birth cohort, all newborns with records of weight less than 2501 gms (LBW) were identified. Six traumatically delivered infants and one whose mother died were excluded. The newborn delivered as soon as possible before or after each LBW was then identified. This resulted in a normal birth weight (>2500) to low birth weight (<2501) ratio of 1:1. The cohort thus defined consisted of 183 LBW children and their mothers, and 183 age-matched normal birth weight children and their mothers.

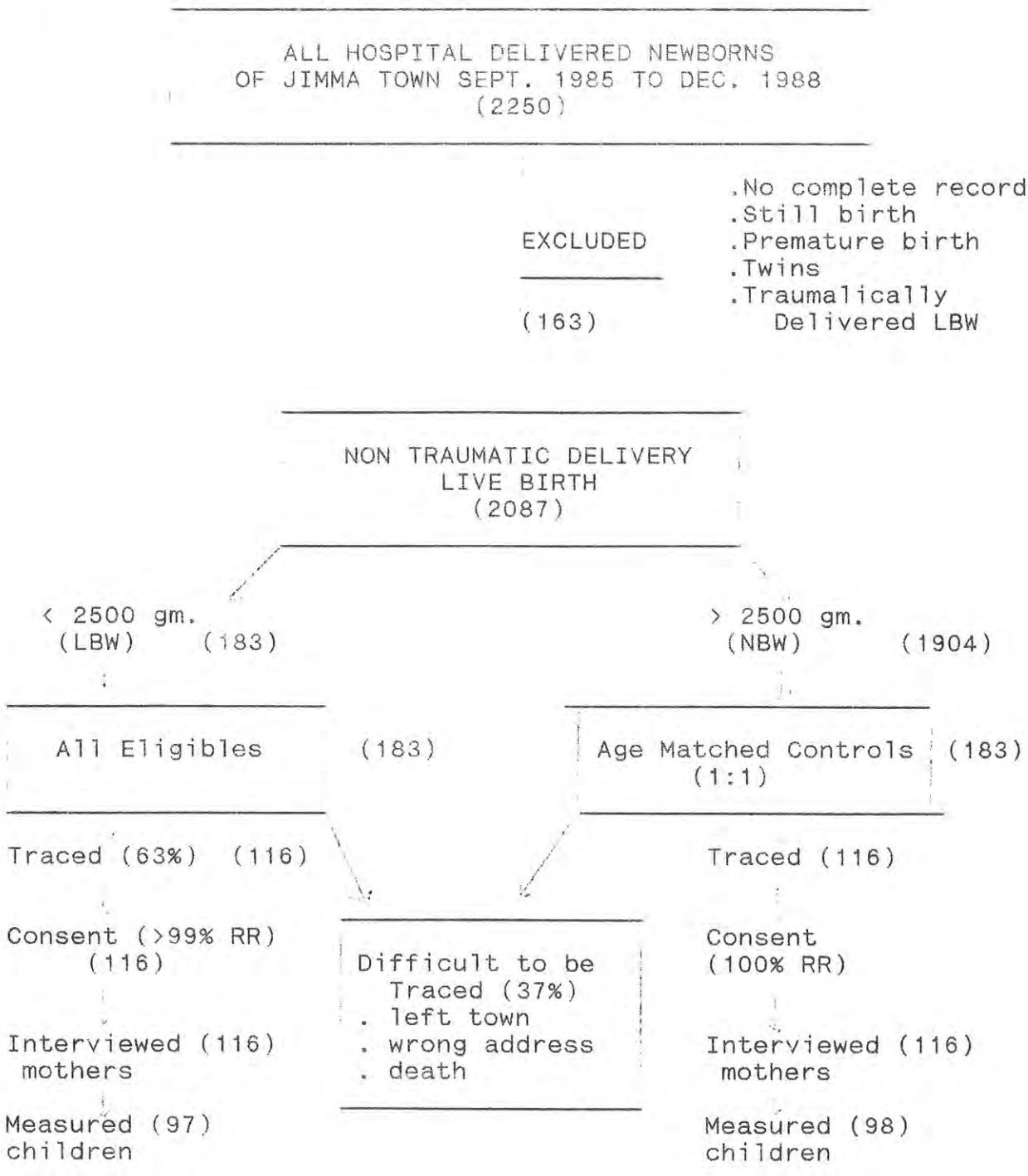

Figure 1: Study Design and Selection Hierarchy. Jimma, 1989

Measurement

1. Exposure measurement

i. Neonatal anthropometry. The exposure variables of interest were birth weight, birth length and birth head circumference. These were obtained from the delivery registration book of Jimma hospital maternity ward. The book reported twelve variables (7 maternal and 5 neonatal) that were measured and recorded by birth attendants ranging from student nurses to specialist obstetricians.

ii. Prenatal exposures. The second set of exposures measured in the study were relatively remote in that they were related to pre-natal events experienced by mothers during their pregnancy. These were categorized into socio-demographic, health behavior, and obstetric characteristics. Socio-demographic characteristics included family income, occupation, education and marital status. Reproductive history included parity, spacing, abortions, and antenatal care. Maternal health behaviors included chat chewing (catha edulis) and the use of traditional and modern medications. This information was obtained by personal interview.

2. Outcome measurements.

i. Mortality and morbidity. Mortality outcomes were obtained by interviews that included questions on death, age, and symptom at death. Apgar score were not consistently recorded; and when recorded was as either 'good' or 'bad', or with no time

specification. So it was not used as an outcome variable for neonatal morbidity. Morbidity outcomes in the questionnaire included items on recent (past two weeks preceding the interview date) morbidity, frequency of illnesses since birth, number of hospitalizations and disability (see Appendix A).

ii. Nutritional status. This was measured by the anthropometric variables of weight, length/stature, and head circumference. Measurements were taken by experienced and trained lay field workers. To minimize inter-observer variation, two workers made independent assessments. Figures were read to one decimal point for weight. WHO recommended Salter spring balance and the Appropriate Health Research Technology Action Group (AHRTAG) designed locally prepared length board were used for weight and length measurements, respectively.

Data Collection

Data on neonatal anthropometric variables were obtained from the maternity registration book of Jimma regional hospital. Maternal exposure variables of socio-demographic and obstetric parameters and outcome variables of mortality and morbidity for the study children were all collected by the interviewer administered questionnaire. The questionnaire was developed in such a way that most of the questions were closed, had precoded answers and had a space for entering the codes. It was pretested mothers similar to the study population and appropriate revisions were made to the final version.

Based on the criteria of secondary school completion, prior experience in community based data collection, and fluency in Amharic and Oromigna, interviewers were selected and trained for two consecutive days. Together with the interviewers, community health workers (CHWs) in each 'Kebele' were involved to solicit the respondent's participation and to facilitate the interview and the measurements. To reduce information bias, the interviewers, the CHWs, and the mothers were not informed about the issue of birth weight and to what group an individual belonged.

Figure 2 schematically represents the procedures followed in tracing study subjects, starting from the maternity registration book through to the actual interview.

Analysis

The data were first analyzed in terms of descriptive statistics such as frequency distributions for birth measurements. Secondly, bivariate analyses were conducted to examine the outcome differences between LBW and normal birth weight children. Thirdly, bivariate and multiple regression analyses were performed in order to identify exposure variables predictive of the outcomes measured. Age was covariated in all the analyses to control for potential confounding effect on outcomes of morbidity and nutritional status. Analyses were carried out using the SPSS/PC+ statistical package.

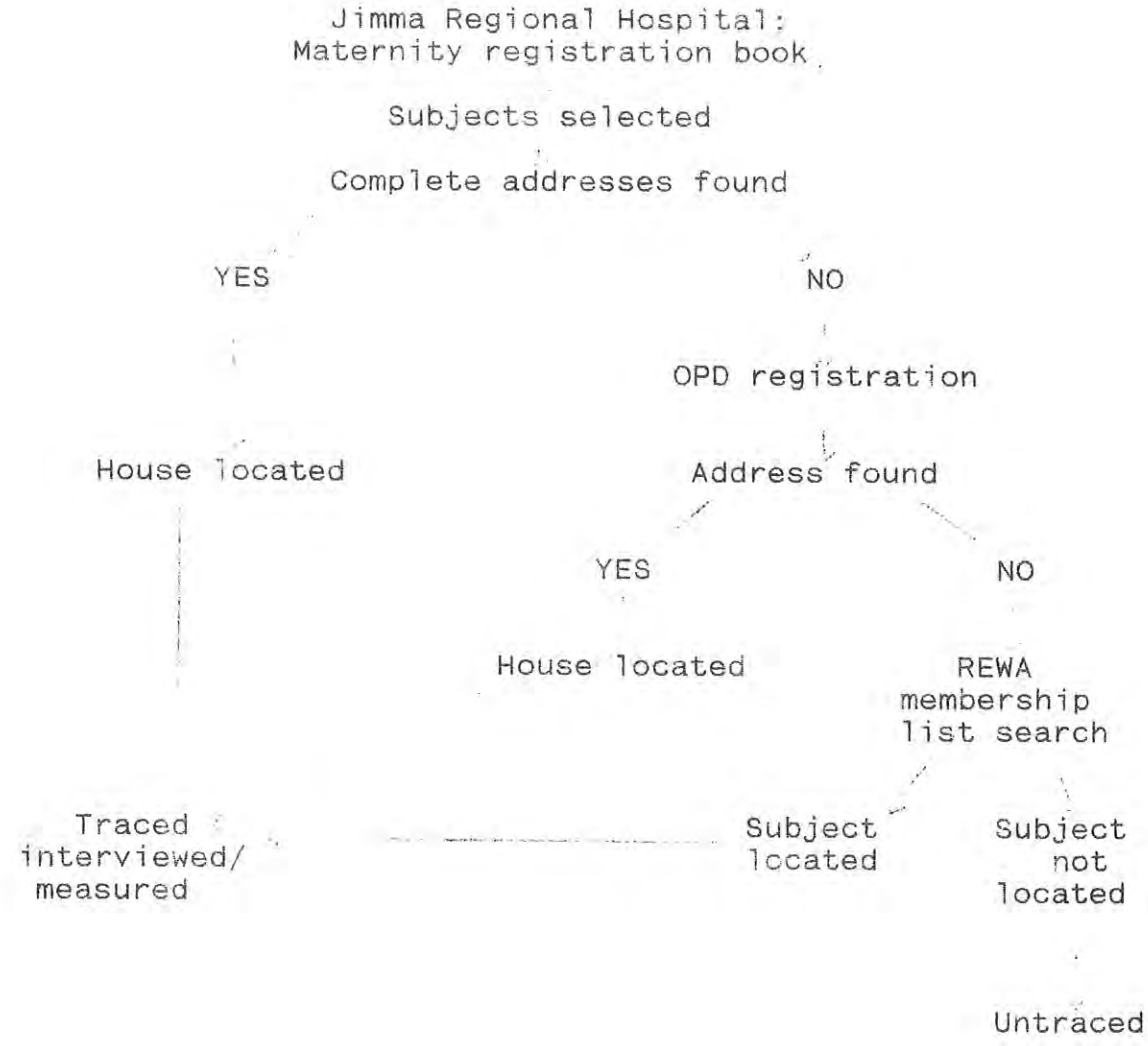

Figure 2. Tracing of Study Subjects

RESULTS

A. Birth Outcomes and Enrollment

In Jimma Regional Hospital approximately 3000 deliveries took place during the period September, 1985 to December, 1988, of which about 75% were from the study town, 15% from other areas and 10% had no address recorded. Table I summarizes the birth outcomes for all deliveries during the period of study among Jimma-town residents. It was found that 13.1% of all births were LBW, of which 11.1% were reported to be born at term.

The mean birth weight and mean birth length for all term live births as the Jimma Regional Hospital during the periods September '85 to December '88 were 3.2 kg and 50.3 cm respectively. Both measurements are comparable to National Center for Health Statistics (NCHS) standard values which are 3.3 kg and 3.2 kg for birth weight of males and females respectively, and 50.5 cm and 49.9 cm for birth length of males and females respectively.

Of the 183 LBW children 116 (63%) of the LBW children and their control were successfully located and investigated. Reasons for not being located included change of residence (30%), wrong addresses recorded (50%), absent on three return calls (15%) and death of mother (5%). Since there was incomplete information on maternal characteristics, it was imposible to make comparisons between the 'located' and 'not located' mothers.

Anthropometric measures at birth for the LBW and NBW children entered into the cohort are presented in table II.

Table I

Birth Outcomes by Birth Weight Cateogry at Jimma Regional Hospital, 09/85 to 12/88

Outcome	Birthweight Category			
	2500gm or less		Over 2500g	
	N	(%)	N	(%)
Term live birth	251	(11.1)	1966	(86.9)
Premature	45	(2.0)	-	

2. NUTRITIONAL OUTCOMES

2.1 Comparison between the LBW and NBW children.

Table III shows means and standard deviations of weight and height for the two birth weight groups. This, of course, excludes 26 deaths and children for whom antrhopometric measurements couldn't be taken. Consistent differences in both weight and height over all the age groups were observed. For all age groups, LBW children were lighter and shorter when compared to NBW children. To determine the effects of birth weight, age and sex on the observed differences, analyses of variance were performed. Birthweight and age significantly accounted for the observed differences but sex did not, either by itself or in interaction with the other variables. Differences for weight narrow after the second year and that of length and weight for length start earlier at about 18 months.

2.2 Comparison with reference NBW population

Weight and height measurements of children in LBW and NBW groups were expressed as percentages of the median of the NCHS reference population. The distribution of these percentages is shown in table IV and V. LBW differed significantly from NBW children with respect to weight for age over all age group categories. Analyses of variance revealed birth weight and age to have significant effects in explaining the observed differences.

Further a stepwise multiple regression analysis was performed, to assess the relative importance of factors

Table II

Anthropometric Measures of LBW and NBW Children at Birth

Measure	LBW	NBW
Weight (gm)		
Mean	2332	3335
SD	164	386
Length (cm)		
Mean	48.4	50.5
SD	2.4	2.3

* LBW: Low Birth Weight

** NBW: Normal Birth Weight

Table III

Weight and Height of Children by Age and Birth Weight Group

Age (months)	LBW N.	LBW Wt(kg) Mean	LBW Wt(kg) SD	LBW Ht(cm) Mean	LBW Ht(cm) SD	NBW N.	NBW Wt(kg) Mean	NBW Wt(kg) SD	NBW Ht(cm) Mean	NBW Ht(cm) SD
0-6	17	5.1	1.1	54.5	4.4	19	6.0	1.4	56.6	4.0
7-12	14	6.4	1.3	62.0	3.8	19	8.3	1.3	65.7	6.1
13-18	15	8.6	1.0	71.2	3.6	17	10.6	1.1	71.8	5.9
19-24	14	9.7	2.1	74.3	6.5	8	10.6	1.5	75.0	3.5
25-40	31	11.8	1.6	81.3	6.9	33	12.2	1.3	82.7	5.9

Table IV

Weight and Height of LBW and NBW Children as a Percent of NCHS by age Group

Age group (months)	LBW			NBW		
	W/A	L/A	W/L	W/A	L/A	W/L
0-6	89.5	90.2	119.4	105.6	94.3	125.6
7-12	73.6	88.2	105.6	94.2	92.4	119.1
13-18	82.3	90.7	99.5	94.3	90.5	115.8
19-24	82.1	87.4	103.6	86.5	86.5	109.8
25-40	85.3	87	107.5	87.5	88.3	108.4

predictive of a child's weight-for-age, height-for-age and weight for - height expressed as percentage of the NCHS standard population. The following were used as possible independent variables.

Mother related : income, education, age.

Child related : birth weight, age.

Birth weight had a positive influence on all three measurements, weight being highly influenced. Increase in age negatively influenced all the anthropometric measurements. Weight for height decreased with increasing income. These results are summarized in table VI.

3. MORBIDITY OUTCOMES

The two week morbidity prevalence, recorded as a 'yes' or 'no' dichotomous variable, was cross tabulated with LBW and NBW groups to determine whether any association existed. Morbidity prevalence was observed more frequently in LBW children. These and other significant associations are summarized in table VI.

4. MORTALITY OUTCOMES

Of the total children studied 26 died during 40 months time. The number is small and no significant relations with maternal, demographic, or pregnancy characteristics were found.

Table V

Distribution of LBW and NBW by Nutritional Status

Variable	LBW N.	LBW (%)	NBW N.	NBW %	Rate Ratio (95% CI)
1.Wt/age *					
normal	34	35	53	54	0.46 (0.24,0.85)
mild	44	45	35	36	1.96 (1.06,3.64)
moderate + severe	19	20	10	10	2.96 (1.23,7.13)
Total	97	100	98	100	

* $p < .05$

Table VI

Summary of multiple regression analysis for factors predictive of nutritional outcomes

Nutrition outcome	Predictive Factors	beta	t stat	p value
A.Weight for age	1.Birth weight	.29	4.23	.001
	2.Age	-.22	-3.12	.01
B.Height for age	1.Age	-.27	-3.72	.001
	2.Birth weight	.19	2.80	.005
	3.Maternal edu.	.22	3.04	.001
	4.Maternal age	.16	2.16	.05
C.Weight for ht.	1.Age	-.26	-3.64	.001
	2.Birth weight	.16	2.30	.05
	3.Income	-.15	-2.01	.05

TABLE VII

Summary of bivariate relations of birth weight category with morbidity variables

Variable	LBW No	LBW (%)	NBW No	NBW (%)	Rate Ratio (95% CI)
Morbidity prevalence *	53	52.5	36	35.3	2.02(1.11,3.70)
Frequency of illness **	102	93	80	72.1	6.01(2.34,15.9)
Hospital admitted	21	22.6	17	19.3	0.96(0.44,2.10)

* $p < 0.05$, ** $p < 0.001$

DISCUSSION

Since complete information was not available in the delivery registration book, calculation of rates for the hospital are only rough estimates. The estimated rates of LBW and premature births agree with other reports in developing countries and with reports from other parts of the country (4,13,14). But the use of different lower cut-off points by several studies in defining LBW cautiones against strict comparison of different study findings. Only half of the deliveries in the study area are attended in the hospital. Thus they are not fully representative of the study area. Unless hospital utilization characteristics of mothers who deliver in the hospital and those who deliver at home are studied, the findings in this study cannot be projected to the population. Mean measurements of birth weight and birth length for the total population of hospital deliveries do agree with the findings from other developing countries (4,17). A mean birth weight of 2332 gms. and a standard deviation of 164 gms. for the LBW children in this study shows that most of the LBW children were well over 2000 gms.

With respect to curent anthropometric measurements, the LBW children had lower mean weight and mean height than the normal birth weight children. The difference was present over all age

groups studied but narrowed with increase in age. The highest difference of 2 kgs. for measurements of weight between the LBW and NBW children was observed in the age group of 13-18 months and there after the difference decreased. Comparison of weight and height of the two birth weight groups in percent of the NCHS standard also showed a decrease in the difference between the two groups as age increased. A difference of about 16% W/A (105.6% vs 89.5%) between the NBW and LBW was observed in the first six months of life. At about 40 months of postnatal life, the difference was only 2.2% W/A. This difference of W/A between the age groups of 0-6 months and 25-40 months was 4.2% (89.5% vs 85.3%) for the LBW children and 18.1% (105.6-87.5%) for the NBW children. Thus, the LBW children seem to have contributed more to the narrowing of the gap, probably due to their faster rate of growth. To support this fact, a well designed longitudinal study using a farily large number of subjects is required. In other studies, as well, differences of weight were reported to persist, yet with a decreasing gap from birth through 7 years (15). Small differences were noted at 10 years of age in a follow up study (19).

In this study LBW children were more likely to have lower nutritional status than children in the normal birth weight group. When all degrees of malnutrition were combined the LBW children were at significantly elevated risk for being

malnourished. The relative risk of LBW children in comparison with the NBW children for the different degrees of malnutrition showed a progressive increase.

Results of a step-wise multiple regression analysis showed birth weight, maternal education and maternal age (15-45) to have positivelly influenced current nutritional status. Yet, the age of child had a negative influence. As discussed earliear both weight and height expressed in percent of the NCHS standard decreased as age increased in both the LBW and NBW children. The mere increase in age by itself can't be thought of as a risk factor. Other factors such as chronic infection and animea. should be considered for inclusion in the analysis as possible risk factors.

In contrast to other studies, proxies for income did not influence any of the indices of nutritional status. On the contrary, this study showed income to have negatively influenced nutritional status in both birth weight groups. Yet, the reliability of subjective answers to questions of income, the relatively small range of income and small size of the study subjects make conclusions difficult.

The association of morbidity prevalence with birth weight indicated that LBW children were more likely to be morbid at the time of the study. Similar findings were reported by other studies (2,18). There was also an association of birth weight

category with frequency of illness since birth: LBW children having more illnesses. Unlike other studies (22) that used large sample sizes, there was no significant difference in the frequency of specific symptoms in the present study. Though, rates of hospitalization and disability are more objective measures of morbidity, no significant difference was observed in rates of hospitalization, disability and mortality between the two groups. Since the number of children studied was relatively small, it is difficult to detect differences for infrequently occurring events such as disability and hospitalization.

CONCLUSION AND RECOMMENDATIONS

The present study investigated outcomes of low birth weight with respect to nutritional status and morbidity. We also examined possible relations of these outcomes with maternal risk factors for LBW. The findings suggest that LBW children are prone to be malnourished and at risk for being frequently ill, at least up to 40 months of postnatal life.

In light of the current study we recommend:

1. Record keeping system of the hospital should be strengthened.
2. Promote growth monitoring, using the LBW children as entry points, and strengthen MCH activity.
3. Further conduct longitudinal studies on LBW children to substantiate the present findings.

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APPENDIX A
JIMMA TOWN HEALTH SURVEY

It is to be remembered that you gave birth at Jimma hospital. On issues related with come to ask you questions. Would you please cooperate?

1. Mother's full name_____
2. Age
3. Higher
4. Kebele
5. House no.
6. Gender 1. Male
   2. Female
7. Age_____ Month_____
8.
9.
10.
11. Is the child alive?
    1. No
    2. Yes; if yes to Qn 20 if no page 33
12. Age at death
13. a/_____days (if ≤ 28 days)
    b/_____months (if > 28 days)
13. What symptom/symptoms did he have at or shortly before death
    1. Cough
    2. Shortness of breath
    3. Diarrhea
    4. Fever/coldness
    5. Body wasting
    6. Others
14. While alive, was he frequently ill?
    1. No
    2. Occasionally
    3. Frequently
15. If 2 or 3, what was his frequent symptoms?
    1. Cough
    2. Shortness of breath
    3. Diarrhea
    4. Fever/coldness
    5. Body wasting
    6. Others

    _____
    _____

16. For his frequent illness was he ever taken to hospital, health centre, or clinic, pharmacy or any other place?
17. Was he ever hospitalized?
    1. No
    2. Yes
18. If yes, how many times?
19. While alive, did he have problems of sight, hearing, crawling, walking or any other physical problem?
    1. No
    2. Yes
20. In the last 2 weeks, has he been sick?

21. If yes, what?
    1. cough
    2. Shortness of breath
    3. diarrhea/vomiting
    4. Fever/coldness
    5. Body wasting
    6. Others
22. What measures have you taken for his recent problem?
    1. None
    2. Traditional
    3. Hospital, health clinic,??
    4. Others

23. Has he had problems of sight, hearing, crawling or walking or any other physical problem?
    1. No
    2. Yes
24. Has he ever been sick?
    1. No
    2. Occasionally /if she remembers it how many times?/
    3. Frequently
25. If 2 or 3 what are his frequent symptoms?
    1. Cough
    2. Shortness of breath
    3. Diarrhea
    4. Fever
    5. Body wastage
    6. Others

26. For his problems has he been seen at hospital, health centre, HS or any other place?
    1. No
    2. Yes
27. Has he ever been hospitalized?
    1. No
    2. Yes
28. If yes, how many times?

Qus. 28-33 for the underlined ?? state reasons at the back.

29. Immunization
    1. Completed
    2. ?
    4. ?
    5. ?
30. Breast feeding
    1. Breast feeding/fed
    2. Never breast fed
31. For those supplemented: at what age was he given supplementary feed?
32. How long was the totally breast feed?
33. Bottle feeding:
    1. Being fed/was fed
    2. Never fed
34. Has he been subjected to ??/milk tooth extraction/ ???/or any other traditional disease prevention
    1. No
    2. Yes

35. Educational status:
    1. Doesn't read and write
    2. Reads and writes (99)
    3. Last grade completed
36. Mother _____
37. Father_____

38. Average monthly income ___ ___ ___ ___
39. Is there a latrine you are using?
    1. Yes
    2. No
40. From where do you get drinking water
    1. Pipe
    2. Other

41. Number of pregnancies up to this child ___ ___
42. Abortions, before this child
    1. None
    2. Yes, I had
43. If yes to Q. 42 how many ___ ___
44. Number of deliveries (alive + dead) ___ ___
45. The difference between this child and the previous child is ___ months ____
46. Did you take, chat, cigarettes or alcohol when pregnant
    1. No
    2. Yes
47. Drugs (traditional)
    1. No
    2. Yes
48. Did you follow ANC
    1. No
    2. Yes
49. If yes to Q. 48, did you take pills for anemia
    1. No
    2. Yes
50. Do you remember the birth weight of this child
    1. No
    2. Yes
51. The child was born
    1. Within a marriage
    2. Without a marriage
52. Ethnicity
    1. Amhara
    2. Oromo
    3. Keffa

4. Kulla
5. Guragie
6. Janjero
7. Other, specify

53. Mother_____
54. Father_____

Date_____ Interviewer's name_____

Signature_____

በድማ ከተማ የጤና

ቃለ መጠይቅ

በ19 _____ወር _____ ቀን፣ ድማ ሆስፒታል ወንድ/ሴት ልጅ ወልደው ነበር:: ስለዚሁ ልጅ ጉዳይ ከጤና ጋር የተዛመዱ አንዳንድ ነገሮች ለማጥናት ስለፈለግን ይተባበሩን ዘንድ በማክበር እንጠይቅዎታለን::

የድማ አውራጃ ጤና ጥበቃ ጽ/ቤት

1. የእናት ስም /ሙሉ/ _____

2. ከፍተኛ

3. ቀበሌ

4. ቤት ቀጥር

5. የልጁ ጸታ፣1. ወንድ
2. ሴት

6. ዕድሜ ___ ወር ___

7. _____

8. _____

9. _____

10. ልጁ በሕይወት አለ ? 1. የለም
2. አለ/በሕይወት ካለ ወደ ጥያቄ 19 ይሂዱ፣ ሞቶ ከሆነ በዚሁ ይቀጥሉ /

በሕይወት ከሌለ:_

11. በስንት ዕድሜው ሞተ ?

ሀ/ _____ ቀን /እስከ 28 ቀን ብቻ/

ለ/ _____ ወር ከ/28 ቀን በላይ/

12. ሲሞት የነበረው /ረት ዋና የበሽታ ምልክቶች:_

1. ሳለ 4. ማተከስ/መቁዘ ቁዘ
2. ማፈን 5. የሰውነት መመንመን
3. ተቅማጥ 6. ሌላ _____

13. ከመሞቱ በፊት በሽታ ደጋግሞ ያጠቃው ነበር ?

1. አለ ነበረም
2. አልፍ አልፍ
3. በ ተደጋጋሚ

14. ብዙውን ጊዜ ምኑን ነበር የሚያመው ?

1. ሳል
2. ማፈን
3. ተቅማጥ
4. ማተክስ /መ ቀዘ ቀዘ
5. የሰውነት መመንመን
6. ሌላ _____

_____

15. ለነበረበት በሽታ ሆስፒታል ፣ ጤና ጣቢያ ፣ ክሊኒክ ፣ ፋርማሲ ወይም ሌላ ቦታ ተመርምሮ ነበር ?

1. አልተመረመረም
2. ተመርመሮ ነበር

/ ካርዱ ካለው ጠይቀህ መዝግብ /

16. ሆስፒታል ተኝቶ ታክሞ ነበር ?

1. አልነበረም
2. ተኝቶ ነበር

17. ተኝቶ ታክሞ ከነበር፣ ስንት ጊዜ

18. ከመሞቱ በፊት የማየት፣ የመስማት፣ የመዳህ/ የመሄድ ወይም ሌላ የአካል ችግር/ጉዳት ነበረው

1. አልነበረውም
2. ነበረበት

/ጥያቄ 18 እንደጨረስክ ወደ ክፍል 4 ይሂዱ

19. ቢለፈው 2 ሣምንት ውስጥ አሞታል ?

1. አልታመመም
2. ታሞአል

20. ከታመመ ምኑን ? 1. ሳል
2. ማፈን
3. ተቅማጥ
4. ትኩሳት /መ ቀዘ ቀዘ
5. የሰውነት መን ቀጥ ቀጥ
6. ሌላ _____

21. በዚህ ሁለት ሳምንት ውስጥ ላመመው በሽታ ምን አደረጉለት ?

1. ምንም
2. ወደ ቤህል መድሃኒት
3. ጤና ድርጅት /ሆስፒታል ጤና ጣቢያ ፣ ክሊኒክ
4. ሌላ _____

_____

22. የማ የት ፣ የመ ስማ ት ፣ የመ ጻህ / የመ ሄድ ወይም ሌላ ፡ የአካል ጉዳት /ችግር አለው ?

1. የለም
2. አለ

23. ከ ተመለደ አስከ ዛሬ ታሞ ያውቃል ?

1. አል ታመመም
2. አልፍ አልፍ / የሚያስ ታውስ
3. በ ተደጋጋሚ ከሆነ ስንት ጊዜ/_____

24. አልፍ አልፍ ወይም በ ተደጋጋሚ የሚያመው ከሆነ ብዙውን ጊዜ የሚያመው

1. ሳለ
2. ማፈን
3. ተቀማጥ
4. ትኩሳት /ቀዝ ቃዜ
5. ሌላ _____

25. ሆስፒታል፣ ጤና ጣቢያ፣ ክሊኒክ፣ ፋርማሲ ወይም ሌላ ቦ ታ ለበሽ ታው ተመርምሮ ያውቃል ?

1. አል ተመረመረም
2. ተመርምሯል /ካርድ ካለው ይመዝገብ/
3.

26. አስከ ዛሬ ድረስ ሆስፒታል ገብ ቶ ተኝ ቶ ያውቃል ?

1. አል ዞም
2. ተኝ ቷል

27. ተኝ ቶ የታከመ ከሆነ ስንት ጊዜ ?

ክፍል ሰባት

ከጥያቄ 28—33 ድረስ ከቀጥረ ሥር " ____" ያለበት መልስ ከመለሰ " ለምን" ብለህ ጠይቅና በጀርባው ጻፈሉ /

28. የፀረ ስድስት ክትባት

1. ተከትቦ ጨርሷል 3. አቋርጧል
2. እየተከተበ ነው 4. አለ ተከተበም

29. የእናት ሙት 1. እየጠባ ነው /ጠብቷል/
2. አልጠባም

30. ቁጫሪ ምግብ ለጀመረ ከሙት ሴሳ ቁጫሪ ምግብ የጀመረት በስንት ወረ ነው ?

31. ቤጠቃሳይ ሙት ያስጣሉት በስንት ዕድሜው ነው ? /ወር /

32. ሙጠ :_

1. እየጠባ ነው /ጠብቷል /
2. አልጠባም

33. አንጥል ማስቀረጥ ፣ ድድ ማስቢጠጥ፣ ሰውነት መብጣት፣ ወይም ሌሳ ቤህሳዊ የበሽታ መከሳከያ ዘዴ አድርገውለታል ?

1. ተደርጉለታል
2. አልተደረገለትም

ክፍል አራት፣

የትምህርት ደረጃ፣

1. ማንበብና መጻፍ አይችልም /89/
2. ማንበብና መጻፍ ይችሳል /99/
3. በመጨረሻ ያጠና ቀቀት ክፍል

34. የእናት ደረጃ
35. የአባት ደረጃ

36. የቤ ተሰቡ አማካይ የወር ገቢ በብር _____
37. የሚጠ ቀሙባት ሽንት ቤት አለ ?

1. አለ
2. የለም

38. ለመጠጥ የሚሆን ውሃ ከየት ያገኛሉ ?

1. ቧንቧ
2. ሌሳ

ክፍል አምስት፣

39. ይህ ልጅ ሲረገዝ ስንተኛ የእርግዝና ቃ ነበር?
40. ከዚህ ልጅ በፊት ውርጃ ነበሮት ?

1. አልነበረም
2. ነበረኝ

41. ውርጃ ከነበሮት ስንት ጊዜ ? _____
42. ቢጠቃለይ ስንት ወልደቀል / ያሉት ተ ሞተ / _____
43. ከዚህኛው ልጅ ቀደም ብሉ የተወለደ ካለ በሁለተ መሃከል ያለው የዕድሜ ልዩነት _____ ወር
44. ይህን ልጅ እርጉዝ ሆነው ጪት፣ ትምቢህ፣ አልኮል ይወስዱ ነበር ?

1. አልወሰድኩም
2. እወስድ ነበር

45. መድሃኒት የአበሻ ወይም የፈረንጅ ?

1. አልወሰድኩም
2. እወስድ ነበር

46. ይህን ልጅ እርጉዝ ሆነው የእርግዝና ክትትል ያደርጉ ነበር ?

1. አላደረግኩም
2. አድርጌአለሁ

47. ክትትል ካደረጉ ፣ የደም ማነስ፣ ኪኒን ይሰጠት ነበር ?

1. አይሰጠኝም
2. ይሰጠኝ ነበር

48. ይህ ልዩ ሲወለድ የነበረው ክብደት ትዝ ይሎታል ?

1. አይለኝም
2. አዎን ይለኖል / ይገለጽ _____ /

49. ልጭ የተወለደው

1. በጋብቻ ውስጥ
2. ከጋብቻ ውጭ ነው

ብሔረሰብ

1. አማራ
2. ኦሮሞ
3. ከፋ
4. ኩሉ
5. ጉራጌ
6. ሻንጉሮ
7. ሌላ _____
50. እናት
51. አቢት

ቀን _____ ስም _____

ፊርማ _____

DECLARATION

I, the undersigned, declare that this thesis is my work and that all sources of material used for this thesis have been duly acknowledged.

Name Assegid Kebede, M.D.

Signature

Place Addis Ababa, Ethiopia

Date of Submission May, 1989