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A RETROSPECTIVE CASE-CONTROL STUDY ON MATERNAL RISK FACTORS FOR LOW BIRTH WEIGHT NEONATES.

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ABSTRACT

Introduction: Low birth weight may play a significant role in the morbidity and mortality of newborns. Low birth weight is defined as birth weight less than 2500 g since South Asia has the greatest incidence of LBW (27%) among all regions. Age, parity, socioeconomic status, anaemia, diabetes, chronic illness, cardiovascular disease, uterine deformities, and illnesses that disrupt placental implantation, such as reaction diseases, are all maternal risk factors that contribute to a high prevalence of low birth weight kids. **Resources And Methods:** A 1-year, maternal, retrospective research from July 2019 to July 2020,Age, foetal age, parity, body mass index, prior low birth weight, haemoglobin levels, toxicemia of pregnancy, foetal distress, and mode of delivery of the mother were all characteristics that were examined. These data were gathered, and IBM SPSS Statistics for Windows, version 23.0, was used to analyse them. **Discussion:** In this study, anaemia, mother age, pre-physiological state BMI, and age are statistically significant factors causing low birth weight neonates. Age, pre-physiological state BMI, maternal age, and anaemia are statistically significant contributors causing the low birth weight newborns, according to this study. Any or all of the independent variables included the mean and SD. **Conclusion:** Because LBW has a negative impact on a newborn's health and motor and cognitive development, it is important to identify risk factors as well as those that may be avoided.

KEYWORDS : Material Risk Factors, Low Birth Weight Babies

INTRODUCTION :

One of main problems contributing to newborn morbidity and mortality is low birth weight. Birth weight less than 2500 g is considered to be low birth weight. In India, 7.5 million newborns—or nearly 30%—are born with an LBW (less than 2500 g). (1), LBW is a significant public health issue and a major contributor to child morbidity and mortality. According to reports, LBW has been implicated in 60–80% of neonatal mortality globally. Around 20.5 million infants worldwide are born each year with LBW, or 14.6% of all infants. Among these, developing nations account for 96.5% of births of LBW infants [1,2].

South Asia has the greatest incidence of LBW in 2015 (27%) compared to all other regions. Between 2000 and 2015, the prevalence of LBW was essentially constant over the world [2]. Between 2000 and 2015, the prevalence of LBW has remained essentially constant worldwide [2]. India has seen a high prevalence of childhood mortality and malnutrition [3]

Baby LBW prevalence is seen as a sensitive indicator of a country's health and development [5]. In developing children and adolescents, LBW is linked to an increased risk of behavioural disorders, psychological illnesses, and learning and sensory difficulties that impede cognitive function and provide serious challenges to their educational and quality of life (6, 7). Cardiovascular disease, paediatric hypertension, the metabolic syndrome, and adult-onset diabetes are all linked to LBW [8,9]. LBW is also linked to an increased likelihood of aberrant neurological symptoms, including as faulty reflexes, tone, and coordination, which hinder motor development.

In India, the prevalence of low birth weight (LBW) varies between 25 and 30 percent, with 60 to 65 percent of cases being caused by intrauterine growth retardation (IUGR) []. Evidence from emerging nations over time also shows that as a country develops, the incidence of IUGR declines (4)

Low birth weight kids are more likely to occur due to maternal factors such age, parity, socioeconomic status, anaemia, diabetes, chronic sickness, hypertension, uterine anomalies, and illnesses that influence placental perfusion like autoimmune diseases (10). Screening the risk factors reveals that some are modifiable risk factors and some are not.In India, the prevalence of low birth weight can be decreased by identifying risk factors in the mother and providing the right antenatal care and nutrition. In this study, we examine the risk variables that may have contributed to the mother's low birth weight babies.

Methodology :

For a year, from July 2019 to July 2020, a retrospective study was conducted at the Saveetha Medical College and Hospital in South India. Maternal factors like age, gestational age, parity, pre-pregnancy BMI, previous low birth weight, haemoglobin levels, pre-eclampsia, foetal distress, and mode of delivery were examined.

This study was approved by the institutional ethics council, and a complete description of postpartum events, such as Apgar scores and resuscitation, was recorded.

Women who had their babies between 37 and 40 weeks, those with GDM and PIH, those whose pregnancies were complicated by anaemia, and those who had multiple pregnancies were all included in the study. Pregnancies with previous stillbirths, chronic prenatal illnesses like renal, cardiac, and hypertension, obstetrical complications like placenta previa, cervical cerclage, and uterine fibroids, lifestyle factors like smoking and alcohol use, multiple gestations, and babies born with significant foetal malformations and other vascular pathology were also left out of this study.

IBM SPSS Statistics for Windows, version 23.0, was used to analyse all of the obtained data. To characterise the data, descriptive analysis was utilised for categorical variables and for continuous variables, the mean and S.D. were utilized. Sample t tests are used to determine whether there is a significant difference between the groups. Chi square test was used to determine the significance in qualitative categorical data. The probability value of 0.05 is regarded as the significant level for all of the aforementioned statistical tools.

RESULTS :

When the birth weight is consisdered ,the mean Birth weight of LBW was 2.0358 ± 0.267 kg and of NBW was 2.8617 ± 0.3029 kg.

Table 1 : showing the age groups between the two groups

			Groups		
			Cases	Controls	Total
Maternal age	Upto 20 yrs	Count	48	21	69
		%	30.0%	13.1%	21.6%
	21 - 25 yrs	Count	40	58	98
		%	25.0%	36.3%	30.6%
	26 - 30 yrs	Count	64	35	99
		%	40.0%	21.9%	30.9%
	31 - 35 yrs	Count	8	46	54
		%	5.0%	28.8%	16.9%
Total		Count	160	160	320
		%	100.0%	100.0%	100.0%

Value	df	p-value
49.107[a]	3	.0005

Table1,Maternal age between the two groups consisdered < 20 years of age, 48 patients in cases (30%) versus 21 patient in control (13.1%) and 21-25 years, 40 patient (25.0%)versus 58 patient(36.3%) ans 26-30 years, 64(40.0%) vs 35 (21.9%). Out of which most of the patients are seen under the age of 21-30 years of age and 69 patients (21.6%) are seen under the age of 20 years of age, in which 48 patients (30.0%) are seen in cases group which is statistically significant

Table 2: previous low birth weights in cases vs controls

			Groups		
			Cases	Controls	Total
Previous low birth weight	No	Count	116	144	260
		%	72.5%	90.0%	81.3%
	Yes	Count	44	16	60
		%	27.5%	10.0%	18.8%
Total		Count	160	160	320
		%	100.0%	100.0%	100.0%

Value	df	p-value
16.082[a]	1	.0001

Table 2,About 60 patients out of 320 in our study have a history of low birth weight kids, which is one of the most significant independent risk factors taken into account. There are 16 patients in the control group (16%) vs. 44 patients in the case group (27.5%), with the difference being statistically significant.

Table 3: pre eclampsia in cases vs control group

			Groups		
			Cases	Controls	Total
Pre eclampsia	No	Count	147	153	300
		%	91.9%	95.6%	93.8%
	Yes	Count	13	7	20
		%	8.1%	4.4%	6.3%
Total		Count	160	160	320
		%	100.0%	100.0%	100.0%

Value	df	p-value
1.920[a]	1	.166

Table 3 compares the history of pre eclampsia between the groups and doesn't find any statistically significant differences. as there were only 13 cases (8.1%) compared to 7 controls (4.4%).

Table 4 : Foetal distress between two groups

			Groups		
			Cases	Controls	Total
Fetal distress	No	Count	133	138	271
		%	83.1%	86.3%	84.7%
	Yes	Count	27	22	49
		%	16.9%	13.8%	15.3%
Total		Count	160	160	320
		%	100.0%	100.0%	100.0%

Value	df	p-value
.075[a]	1	.785

Value	df	p-value
3.061[a]	3	.382

Table 4, 49 out of 320 babies—27 (16.9%) and 22 (13.8%)—had foetal discomfort, which is not statistically significant.

Table 5 : showing Apgar score between two groups

			Groups		
			Cases	Controls	Total
Apgar score	6/10,7/10	Count	1	0	1
		%	.6%	0.0%	.3%
	7/10,8/10	Count	2	0	2
		%	1.3%	0.0%	.6%
	7/10,9/10	Count	10	11	21
		%	6.3%	6.9%	6.6%
	8/10,9/10	Count	147	149	296
		%	91.9%	93.1%	92.5%
Total		Count	160	160	320
		%	100.0%	100.0%	100.0%

Table 5 ,Only three babies out of 320 had poor Apgar scores, which is not statistically significant, while 296 of the newborns had good Apgar scores.

Table 6 : group statistics of maternal age, Gestational age ,bmi and HB levels

Groups		N	Mean	SD
Maternal age	Cases	160	24.08	4.35
	Controls	160	26.51	4.67
Gestational age	Cases	160	37.97	0.86
	Controls	160	37.90	1.48
Pre pregnancy bmi	Cases	160	21.13	2.94
	Controls	160	25.09	4.87
HB levels	Cases	146	10.42	1.20
	Controls	160	11.12	0.96

When comparing pre-pregnancy BMI between NBW mothers and mothers of low birth weight babies, similarly, HB levels in comparison between the two groups showed that there is highly statistically significant difference with the t value as same as mentioned above but with mean +/SD of 10.4 +/1.2 in cases vs. 11.1 +/0.96 in control group (table 6). These differences are shown to be with mean +/SD of 21.13 +/2.94 and 25.09+/-4.87, respectively (table 6)

Table 7: cumulative data of all variables Yellow colour-statistically significant Blue colour -statistically significant

		Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	p-value	Mean Difference	Std. Error Difference	95% Confidence Lower	95% Confidence Upper
Maternal age	Equal variances assumed	1.617	.204	-4.821	318	.0005	-2.4313	.5043	-3.4234	-1.4391
Gestational age	Equal variances assumed	94.072	.000	.507	318	.612	.0688	.1355	-.1979	.3354
Pre pregnancy	Equal variances assumed	32.770	.000	-8.809	318	.0005	-3.96250	.44984	-4.84753	-3.07747
HB levels	Equal variances assumed	35.330	.000	-5.682	304	.0005	-.7032	.1238	-.9467	-.4597

Maternal age of 20 years, pre-pregnancy bmi of 21, and Hb levels of 10.4 are the independent variables in our study that are thought to be significant risk factors for developing low birth weight kids (table 7).

DISCUSSION :

Low birth weight newborns result in a variety of negative infant outcomes and lower the standard of living for infants under one year old. In our current study, we primarily looked at the relationships between maternal risk factors and low birth weight kids who were delivered between 37 and 40 weeks of pregnancy. Apart from all the difficulties that can be avoided, premature birth is the most frequent cause of low birth weight kids, as we already know.

Maternal age is a key indicator of LBW, according to a few studies. Authors claim there is a different relationship between mature and LBW. Within the group of moms who were young mothers (65.52%), the incidence of LBW was significantly great.According to Viengsaahone, young maternal age is a major risk factor for LBW, with an OR of 8.6 and a 95% confidence interval of 2.4 to 30.7 (12). Maternal age is also thought to be proportionately linked to the risk of LBW. According to Rizvi et al., the risk of LBW doubled as maternal age increased.

In this study, there was a stronger association between pre physiological state bmi and infant birth weight, but studies conducted in the Islamic Republic of Pakistan and Bangladesh have shown that there is a trend towards being overweight (23.9% and 40.1%) and blubber (6.3% and 21.2%), respectively. Pre physiological state bmi is also a key factor influencing low birth weight, and other studies have also demonstrated the same results and even maternal studies conducted in alternative countries come to similar conclusions. (15)

In a cross-sectional study of 331 singleton births in Kolkata, India, it was discovered that female parents (p=1) had a double the risk of delivering an LBW baby compared to parity = 2, a fourfold greater risk of delivering an LBW baby compared to parity = 3, and additionally that there was an additional risk of delivering an LBW baby compared to parity = 3. (17,18).

The outcome of LBW in mothers who are older than 35 years of age is also thought to be contrary to the findings of our study (19), since we tended to find a significant link between this age group with LBW and many other studies reported this finding. Parity has been linked to a higher risk of low birth weight, however in our analysis, parity was not linked to babies that were underweight.

According to Sharma et al. [20], mothers with heights below 146 cm had a sixty-five percent higher likelihood of having LBW children. It has been demonstrated that maternal malnutrition has a deleterious impact on foetal growth. According to an earlier study [21], a mother's poor organic process results in the depletion of nutrient reserves, which may have an impact on a fetus's ability to grow. It's important to remember that a baby's birth weight is determined by both the physiology used information on women's biomarkers acquired at the time of the survey to analyse the relationship between mothers' anaemia and organic process standing and the LBW of their children. Any analysis is performed using longitudinal data in order to find a more significant correlation between mothers' organic process standing and LBW of children.

And numerous other papers recommended taking iron supplements more frequently to prevent anaemia and its repercussions, such as low birth weight in newborns.

Other than Hb levels, inadequate antepartum care, premature birth, vaginal infections, age, parity, and pre physiological condition Bmi, antepartum exposure to chlorination byproducts in drink was linked to hazards, as reported in multiple investigations (21,22,23). incongruous with the frequency of low birth weight babies can be decreased by enhancing the maternal modifiable factors since LBW has detrimental impacts on the neonates and lowers the quality of life for newborns. It should be encouraged to provide pregnant women with nutritional advice and health information about obstetric problems during ANC visits. Pregnancy problems should be promptly identified and managed by medical specialists. Additionally, mothers' quality of life and level of living should be improved. Studies conducted in the community are required to effectively address household and environmental issues.

CONCLUSION :

The frequency of low birth weight babies can be decreased by enhancing the maternal modifiable factors since LBW has detrimental impacts on the neonates and lowers the quality of life for newborns. It should be encouraged to provide pregnant women with nutritional advice and health information about obstetric problems during ANC visits. Pregnancy problems should be promptly identified and managed by medical specialists. Additionally, mothers' quality of life and level of living should be improved. Studies conducted in the community are required to effectively address household and environmental issues.

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Conflict of interest :
None

Limitations of this study :
A single centred study
Sample size is small

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