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Low birth weight and food insecurity at home in Pasto, Colombia

Bajo peso al nacer e inseguridad alimentaria en el hogar en Pasto, Colombia

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Resumen

Introducción: El peso al nacer es un importante indicador de salud del recién nacido, de la madre y de las condiciones de salubridad de una sociedad; además es reconocido como la principal causa de morbimortalidad en la infancia. **Objetivo:** Determinar la asociación entre seguridad alimentaria en el hogar durante el último trimestre del embarazo y el bajo peso al nacer. **Materiales y métodos:** Estudio de casos y controles; se incluyeron 73 recién nacidos a término con bajo peso y 73 neonatos con peso normal. Se analizaron variables demográficas, clínicas y de seguridad alimentaria. **Resultados:** El bajo peso al nacer se asoció con la inseguridad alimentaria en el hogar (OR: 19,3; IC 95%: 6,5-56,9), ajustando por hipertensión arterial de la madre, vaginosis, antecedente de ruptura prematura de membranas y malnutrición gestacional por exceso. **Conclusiones:** Se encontró una asociación importante entre la inseguridad alimentaria en el hogar durante el último trimestre de gestación y el bajo peso al nacer de los neonatos atendidos en el hospital San Pedro de Pasto. La fuerza de la asociación podría subestimarse en ausencia de ajuste por variables clínicas y demográficas.

Palabras clave: Recién nacido de bajo peso; seguridad alimentaria y nutricional; Colombia. (Fuente: DeCS, Bireme).

Abstract

Introduction: Birth weight is an important indicator of the health of the newborn and of the mother. It can also be used as a parameter to define sanitary conditions of societies. Low birth weight is well known as the main cause of morbidity and mortality in childhood. **Objective:** To determine the association between home food security during the last trimester of pregnancy and low birth weight. **Materials and methods:** A cases and controls study that included 73 full-term newborns with low weight and 73 normal weight neonates. Demographic, clinical and food security variables were analyzed. **Results:** Low birth weight was associated with home food insecurity (OR: 19.3; CI 95%: 6.5-56.9), when adjusted to mother's arterial hypertension, vaginosis, antecedent of premature rupture of membranes and gestational malnutrition. **Conclusions:** We found a significant association between home food insecurity during the last gestational trimester and low birth weight of neonates born in San Pedro Hospital, Pasto. The strength of this association could be underestimated in the absence of adjustments to demographic and clinical variables.

Key words: Infant, low birth weight; food and nutrition security; Colombia. (Source: DeCS, Bireme).

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Introduction

Birth weight is a prognostic indicator for human health and development that also reflects health conditions of both mother and child[1]. There is evidence showing that birth conditions have an impact on the ongoing physical and intellectual development. This is the main reason why a child born with low weight will be more likely to have difficulties in the full development of their faculties[2-4] and an increased risk of death[5].

Low birth weight (LBW) is defined as birth of a child weighting less than 2,500 g. Independently of the gestational age[6], LBW has been identified as one of the main risk factors for infant mortality, especially in neonates. LBW increases the risk of infections, malnutrition, infantile paralysis, mental deficiencies, learning disorders, cardiovascular pathologies, metabolic diseases, among others[7]. Finally, LBW is a public health problem that exists in the five continents[8] and is tightly associated with the intergenerational transmission of poverty and inequality[9].

The causes of LBW are multifactorial as they include a complex interaction of fetal, maternal and socioeconomic aspects[10]; those from the maternal side include malnutrition, anemia, inadequate prenatal control, use and abuse of drugs and illicit/toxic substances, obstetric complications, pregnancy in extreme ages and a short intergenesic period[11].

In 2013, the Nutritional Surveillance System of the Health Secretary of the city of Pasto (Colombia) reported that 10.3% of the total neonates from this municipality had presented LBW, which is 28.8% higher than the national rate reported in 2010 (8.0%)[12].

The Nutritional and Food Security (NFS) report shows that most of the population has had (i) enough and stable availability, (ii) access and (iii) timely and permanent consumption of food[13]. Among the main reasons of nutritional insecurity are poverty, lack of food sovereignty, high prices, environmental devastation, deficient food production and distribution, social injustice, and inequality[14].

Because of nutritional requirements during the initial stages of human growth and development, home food security plays an essential role to maintain not only a good nutritional status but also appropriate cognitive, socio-emotional and motor capacities in newborns[15]. Food security does not exclusively depend on the own conditions of families but it is also affected by the geographic context[16]. Although Colombia has experienced an important social and economic development, the country is still characterized by the magnitude of its socioeconomic inequalities[17,18]. In the particular case of the Nariño department and due to its marginalization by the central government, its population has experienced systematic economic and social difficulties. This problematic situation is reflected on the poor industrial development, high unemployment, and noncompetitive productivity of the department[19]. The resulting condition of poverty leads to harmful repercussions on the region such as home good insecurity.

Even though the clinical characteristics associated with LBW has been already analyzed[20], it is necessary to transcend and study the socioeconomic determinants affecting neonatal health. Thus, the objective of this study was to determine the association between home food insecurity during the last trimester of pregnancy and LBW of neonates born at San Pedro Hospital of Pasto (Nariño, Colombia) from September 2015 to February 2016.

Materials and methods

An observational analytic study with a case and control design was conducted with a population consisting of full-term newborns at San Pedro Hospital from Pasto. Given the fact that this hospital is considered a reference institution for neonatal care in the region, the selection of the same population base was guaranteed.

A study case was defined as a full-term neonate (i.e., with 37 gestational weeks) with a body weight lower than 2,500 g at birth. Gestational weight and age were obtained from registries of clinical histories. The exclusion criteria included cases without written authorization from a legal adult representative, neonates from multiple pregnancies, and pathologies that prevented body weight measurements (genetic alterations, malformations or presence of uterine tumors). Control cases were characterized as full-term newborns, with a body weight between 2,500 and 4,000 g at birth, and selected under the same exclusion criteria as described before. For each study

case, the following neonate born at the hospital was used as control.

We used a convenience sample containing all study cases that occurred during the observation period in the referred Hospital, together with a similar number of controls. The power was recalculated considering the following parameters: an expected OR of 5.0, a proportion of LBW of 20%, a control for each case, a confidence of 95%, and a total sample of 146 neonates. Thus, the final power was 80.5%. This calculation was carried out using the epidemiological calculator Epidat version 4.1.

Surveys as well as reviews of clinical histories and the LBW format of the National Institute of Health (INS 110) were used as primary and secondary sources of information. The Latin American and Caribbean Scale for the assessment of Food Security (ELCSA), validated in Colombia[21], was applied. This instrument has 15 variables that were measured through yes/no questions, whose interpretation is based on the number of affirmative items as follows: five correspond to mild food insecurity; between 6 to 10 indicate moderate insecurity; 10 or more affirmative items imply severe insecurity. In order to validate the instrument and control memory bias, participants were asked about household food situation during the three months prior to the survey. Since the collection of information was done at birth, it is guaranteed that the exposure preceded the outcome.

We described social, demographic and clinical variables through tables and summary statistics. Normality was confirmed with the Shapiro Wilk test. Group comparisons were achieved by Pearson's χ^2 independence test, Fisher's exact test, Student's T test for difference of averages with equal variances, and Mann Whitney's U.

A binary logistic regression model was constructed in order to determine the variables that maximized the probability of occurrence of LBW. To this end, the method of successive steps was used considering as candidate variables those that had biological plausibility according to the literature and that fulfilled the Hosmer-Lemeshow criterion ($p \leq 0.25$ in the bivariate analysis).

Ethical considerations

We adhered to the Helsinki declaration and Resolution 8430 from 1993. This research was classified as risk-free and endorsed by the Research Ethics Committee of CES University. All legal representatives of neonates signed the informed consent form and autonomy as well as medical secrecy were always respected. The information was stored and digitized using MS Office Excel 2007, exported, and processed through SPSS version 19 licensed to CES University – Medellín. In addition, we requested approval of the administrative directives of San Pedro Hospital for collection of data and completion of the study.

Results

During the six months of observation, 73 full-term children with LBW (cases) were identified at the Hospital, which had an equal number of controls. Most neonates were males (54.1%) and came from families of low socioeconomic strata. Their mothers had an average age of 25.3 years old and 50% of them had high school as the highest level of education, showing no statistical differences between cases and controls. More than half of the mothers had only one child; although the proportion was higher for the LBW group, there were no statistical differences compared to controls (Table 1).

Clinical characteristics of neonates and mothers

Significant differences were observed between both groups (cases vs. controls) regarding clinical conditions of the mother during pregnancy including arterial hypertension (AH), bacterial vaginosis, premature rupture of membranes (PRM), and malnutrition due to excessive consumption of nutrients (maternal overweight or obesity). A larger proportion of preeclampsia and vaginal infections were observed in the case group (Table 2).

Household food insecurity

58,9% of households exhibited low or moderate food insecurity (Figure 1). This phenomenon was observed more frequently among the cases (83.6% vs 34.2%). Thus, for each household with food insecurity in the control group there were approximately 10 of those in the case group (OR=9.8, 95%IC 4.2 23.3). Given that the number of cases and controls categorized as mild and severe insecurity was low, this variable was dichotomized as the presence or absence of food insecurity in the household.

Table 1. Distribution of social, demographic, and clinical characteristics of neonates in the San Pedro Hospital and their mothers, according to the study group. Pasto, 2015-2106

	Cases n (%)	Controls n (%)	Total n (%)	p
Child gender n (%)				
Man	39 (53.4)	40 (54.8)	79 (54.1)	0.868[1]
Woman	34 (46.6)	33 (45.2)	67 (45.9)	
Socioeconomic stratum of housing n (%)				
Stratum 1	56 (76.7)	55 (75.3)	111 (76)	0.515[1]
Stratum 2	9 (12.3)	10 (13.7)	19 (13)	
Stratum 3, 4[3]	8 (11)	8 (11)	16 (11)	
Mother's education level n (%)				
None of elementary	19 (27.4)	21 (28.8)	40 (28.1)	0.678[1]
High school	36 (49.3)	37 (50.7)	73 (50)	
Technical or superior	18 (24.7)	15 (20.5)	33 (22.6)	
Mother's number of children n (%)				
One	47 (64.5)	37 (50.7)	84 (57.5)	0.115[2]
Two	19 (26)	27 (37)	46 (31.5)	
Three or more[3]	7 (9.5)	9 (12.3)	16 (11)	
History of violence n (%)				
Yes	9 (12.3)	5 (6.8)	14 (9.6)	0.261[1]
No	64 (87.7)	68 (93.2)	132 (90.4)	
Mother's age (years)				
Average (SD)	24.8 (7.1)	25.7 (7.2)	25.3 (7.1)	0.387[2]
Median (IR)	23.0 (12.0)	25.0 (11.0)	24.0 (11.0)	
Min -Max	15 - 42	13 - 43	13 - 43	
%CV	28.4%	27.9%	28.2%	
Mother's height (m)				
Average (SD)	1.54 (0.06)	1.55 (0.06)	1.55 (0.06)	0.197[4]
Median (IR)	1.54 (0.08)	1.55 (0.08)	154 (0.07)	
Min -Max	1.41 – 1.67	1.42 – 1.68	1.41 – 1.68	
%CV	3.6%	3.5%	3.6%	
Mother's Body Mass Index (BMI)				
Average (SD)	22.83 (2.94)	24.08 (3.58)	23.45 (3.32)	0.022[4]
Median (IR)	22.64 (3.22)	24.12 (5.22)	23.14 (4.51)	
Min -Max	17.3 – 32.9	17.4 – 33.6	17.3 – 33.6	
%CV	12.8%	14.9%	14.2%	
Neonate's height (cm)				
Average (SD)	46.33 (2.42)	49.14 (1.99)	47.73 (2.62)	0.0001[2]
Median (IR)	47 (3)	49 (3)	48 (4)	
Min -Max	38 - 52	44 - 53	38 – 53	
%CV	5.2%	4%	5.5%	
Newborn cephalic perimeter (cm)				
Average (SD)	32.18 (1.59)	34.22 (1.25)	33.2 (1.76)	<0.0001[2]
Median (IR)	32.5 (1.5)	34 (1.5)	33.45 (2)	
Min -Max	26.5 – 34.5	31.5 – 37,0	26.5 – 37.0	
%CV	4.9%	3.7%	5.3%	
Neonate's body weight (g)				
Average (SD)	2201 (276.8)	3055 (310.8)	2628 (519)	<0.0001[2]
Median (IR)	2300 (300)	3030 (465)	2502 (744)	
Min -Max	1150 – 2495	2510 – 3860	1150 - 3860	
%CV	12.6%	10.2%	19.7%	

[1] Pearson's Chi-square test
[2] Mann Whitney's U
[3] The two categories were joined since some of them have frequencies lower than 5
[4] Student's T test for independent samples
IR: interquartile range
SD: standard deviation

Table 2. Distribution of clinical and obstetric history of mothers, according to study group

	Cases n (%)	Controls n (%)	Total n (%)	p
Anemia				
Yes	13 (17.8)	10 (13.7)	23 (15.8)	0.496[1]
No	60 (82.2)	63 (86.3)	123 (84.2)	
Arterial hypertension				
Yes	19 (26)	5 (6.8)	24 (16.4)	0.002[1]
No	54 (74)	68 (93.2)	122 (83.6)	
Risk of premature birth				
Yes	31 (42.5)	20 (27.4)	51 (34.9)	0.056[1]
No	42 (57.5)	53 (72.6)	95 (65.1)	
Urinary infection				
Yes	46 (63)	40 (54.8)	86 (58.9)	0.313[1]
No	27 (37)	33 (45.2)	60 (41.1)	
Vaginal infection				
Yes	40 (54.8)	21 (28.8)	61 (41.8)	0.001[1]
No	33 (45.2)	52 (71.2)	85 (58.2)	
Premature rupture of membranas				
Yes	3 (4.1)	10 (13.7)	13 (8.9)	0.042[1]
No	70 (95.9)	63 (86.3)	133 (91.1)	
Intense physical activity				
Yes	15 (20.5)	14 (19.2)	29 (19.9)	0.836[1]
No	58 (79.5)	59 (80.8)	117 (80.1)	
Overweight of obesity				
Yes	15 (20.5)	29 (39.7)	44 (30.1)	0.012[1]
No	58 (79.5)	44 (60.3)	102 (69.9)	
Maternal malnutrition				
Yes	7 (9.6)	6 (8.2)	13 (8.9)	0.771[1]
No	66 (90.4)	67 (91.8)	133 (91.1)	
Alcohol, tobacco or drugs usage				
Yes	2 (2.7)	2 (2.7)	4 (2.7)	1.000[1]
No	71 (97.3)	71 (97.3)	142 (97.3)	
History of abortion				
Yes	10 (13.7)	8 (11)	18 (12.3)	0.615[1]
No	63 (86.3)	65 (89)	128 (87.7)	
Intergenesic cycle less than 2 years				
Yes	1 (1.4)	2 (2.7)	3 (2.1)	0.560[1]
No	2 (98.6)	71 (97.3)	143 (97.9)	1.000[2]
Mother took micronutrients during pregnancy				
Yes	68 (93.2)	72 (98.6)	140 (95.9)	0.095[1]
No	5 (6.8)	1 (1.4)	6 (4.1)	0.209[2]
Late prenatal control				
Yes	6 (8.2)	10 (13.7)	16 (11)	0.289[1]
No	67 (91.8)	63 (86.3)	130 (89)	
Less than 5 prenatal controls				
Yes	16 (21.9)	8 (11)	24 (16.4)	0.740[1]
No	57 (78.1)	65 (89)	122 (83.6)	

[1] Pearson's χ^2 independence test
[2] Fisher's exact test

Social, demographic, clinical and food insecurity factors related to LBW

We found a statistical association between LBW and food insecurity, arterial hypertension (AH), bacterial vaginosis as well as maternal overweight or obesity. The highest association measure (raw OR) was observed in food insecurity (Table 3), i.e., the probability to present LBW is 9.8 higher in households with food insecurity. On the other hand, the possibility of LBW when mothers suffered with preeclampsia was four times higher compared to mothers without this disease (OR=5.0). Interestingly, a greater odds ratio was calculated for neonates

whose mothers did not have overweight, which suggests a possible protective effect.

Characteristics that best explain the presence of LBW

A binary logistic regression model was constructed that also was unconditional, explanatory. The following were our adjustment variables: having less than five prenatal controls, receiving micronutrients during pregnancy, presenting previous threads of preterm delivery, arterial hypertension, bacterial vaginosis, history of PRM and overweight of mothers. We chose the most parsimonious model, which included food insecurity, arterial hypertension, bacterial vaginosis, history of PRM and overweight and explained 54.7% of the of the variation in the logit or presenting LBW.

After adjustments, the measure of the association between LBW and food insecurity increased significantly (raw OR: 9.8; adjusted OR: 19.9), which would indicate an underestimation of the effect of food insecurity on the raw analysis (Table 4).

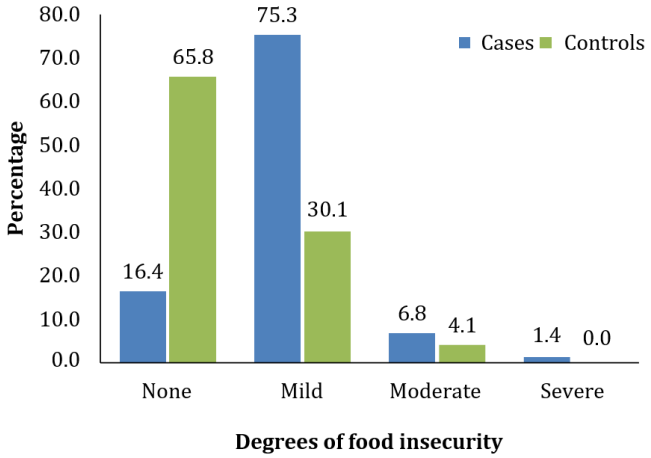

Figure 1. Percentage distribution of food insecurity according to the study group

The proportion of food insecurity (mild, moderate and severe) is higher in cases compared to controls. Pearson's ⍰⍰ independence test: 37.2 (p<0.0001)

Table 3. Social, demographic, and clinical characteristics associated with low birth weight

Variable	Cases		Controls		OR	p[1]	95% CI OR
	n=73	%	n=73	%			
Food insecurity	61	83.6	25	34.2	9.8	<0.0001	4.45 – 21.41
Late prenatal control	6	8.2	10	13.7	0.6	0.294	0.19 – 1.64
Less than 5 prenatal controls[2]	16	21.9	8	10.9	2.3	0.079	0.90 – 5.72
Mother took micronutrients	5	6.8	1	1.37	5.3	0.133	0.60 – 46.48
Urban origin	24	32.9	30	41.1	0.7	0.304	0.36 – 1.38
Anemia	60	82.2	63	86.3	1.4	0.497	0.56 – 3.35
Intergenesic interval < 2 years	1	1.37	2	2.74	0.5	0.567	0.04 – 5.56
Preterm delivery risk	31	42.5	20	27.4	2.0	0.058	0.98 – 3.91
Arterial hypertension	19	26	5	6.8	4.8	0.003	1.68 – 13.65
Maternal urinary infection	46	63	40	54.8	1.4	0.313	0.73 – 2.73
Bacterial vaginosis	40	54.8	21	28.8	3.0	0.002	1.51 – 5.95
Violence	9	12.3	5	6.8	1.9	0.267	0.61 – 6.01
History of PRM[3]	10	13.7	3	4.1	0.3	0.054	0.07 – 1.02
Maternal malnutrition	5	6.8	3	4.1	1.2	0.772	0.38 – 3.71
Maternal overweight	15	20.5	29	39.7	0.4	0.013	0.19 – 0.82
Low education level	19	26	21	28.8	0.9	0.711	0.42 – 1.80
Low socioeconomic stratum	56	76.7	55	75.3	1.1	0.846	0.50 – 2.31
Intense physical activity	15	20.5	14	19.2	1.1	0.836	0.48 – 2.46
History of abortion	10	13.7	8	10.9	1.3	0.615	0.48 – 3.48

[1]Pearson's ⍰⍰ independence test. [2]Prenatal control. [3]Premature rupture of membranes.
Raw OR

Table 4. Unconditional binary logistic regression model for LBW in terms of food insecurity, adjusted to mother's clinical factors

		95% CI					95% CI	
	Raw OR	**Inferior**	**Superior**	**Adjusted OR**	**Standard error**	**p**	**Inferior**	**Superior**
Food insecurity	**9.8**	**4.5**	**21.4**	**19.9**	**0.53**	**<0.0001**	**7.0**	**56.7**
Arterial hypertension	4.8	1.7	13.7	10.5	0.71	0.001	2.6	41.8
History of PRM	0.3	0.1	1.0	0.05	0.84	0.001	0.0	0.29
Overweight or obesity	0.4	0.2	0.8	0.24	0.52	0.007	0.1	0.67
Bacterial vaginosis	3.0	1.5	6.0	4.00	0.48	0.005	1.5	10.44
Constant				0.12				

Nagelkerke's R^2 0,547

Discussion

Household food insecurity during the las trimester of pregnancy was strongly associated with LBW at Hospital San Pedro during the study period. The measure of the raw and adjusted effects differed as seen in the 97.8% increase of the OR after considering clinical characteristics of pregnancy. Thus, the possibility to present LBW is 19.9 times higher when there is food insecurity compared to a household without insecurity.

Some studies have associated LBW with socioeconomic and nutritional factors such as home income, food quality and quantity, and education level of parents. Demelash, *et al*.[22], found that LBW was related to both a monthly income lower than US$ 26 (OR: 3.8; 95% CI: 1.54-9.41 and absence of parents' formal education (OR: 6; 95% CI: 1.34-26.90). Also, Misra *et al.* stated that quality and quantity of maternal diet during pregnancy are important determinants of neonate birth weight[23]. Finally, Kader and Perera concluded that maternal education, nutritional status, and prenatal care are crucial elements for the occurrence of LBW[24].

The influence of maternal nutrition on newborn weight has been studied in different contexts and populations. They have shown consistent results with respect to the need of a minimum level of nutrients that are required to achieve an adequate weight at birth. They have also demonstrated the impact of nutritional interventions during pregnancy, in contrast to those executed at other moments of the mother's vital cycle[25-27].

We observed that arterial hypertension of the mother was associated to LBW, which coincides with the reviewed literature; Bello *et al.*[28], reported an association between preeclampsia and LBW (OR:3.2; 95% CI: 2.1-5.1), while Bramham *et al.*[29] in a meta-analysis observed that chronic hypertension was also related to LBW (RR: 3.2; 95% CI 2.2; 4.4). A physiological explanation for these findings is that chronic low flow of blood in both placenta and fetus during intrauterine growth leads to poor fetal development and LBW[28].

With respect to vaginal infections, it has been reported a connection with LBW that is similar to what we observed. For instance, Thorsen, *et al.,* and Afolabi, et al, described that this association is common in both preterm and full-term neonates[30,31]. A possible explanation for these observations would be that the production of pro-inflammatory cytokines induced by the infection could lead to fever and generate loss of weight.

There is evidence supporting a relation between PRM and LBW. Muchemi, *et al.*[32], (OR: 2.95, 95% CI: 1.14-7.62) proposed the presence of vaginal infections as a causal mechanism. Afolabi, *et al*.[31], found that for each case of LBW in women without any alteration seven neonates were born from mothers with PRM (RR: 6.75; 95% CI: 3.11-14.67). Contrary to those studies, our data indicates a possible protective association that is difficult to understand. However, we suggest as plausible explanations for our findings (i) the exclusive inclusion of full-term neonates, (ii) that mothers diagnosed with PRM were hospitalized in order to keep the fetus until reaching normal weight and gestational age, and (iii) that PRM occurred late during gestation.

On the other hand, it has been reported that mothers with overweight could have larger neonates and experience fetal macrosomia (OR: 1.45, 95% CI 1.29-1.63 and OR 1.88, CI 1.67-2.11)[33]. They suggested a possible protective association that could be explained because the fetus would receive enough nutrients from the overweight or obese mother since they have a higher concentration of blood sugar.

We were not able to find an association between LBW and area of residence, which contradicts previous studies showing an increased risk of LBW for those residing in urban areas (OR: 2.1; 95% CI: 1.04-4.33)[22]. A possible explanation is that, despite the fact that the Hospital serves all health regimes, our studied population mainly belongs to low socioeconomic strata of Pasto, with a low number of patients coming from rural areas. This proportion was observed in both cases and controls.

Similarly, no association between maternal anemia and LBW was found, a result that agrees with what Koura, *et al*.[34], found in Africa. However, a systematic review with meta-analysis by Misra, *et al.*[23] revealed an association between maternal anemia during the first gestational trimester and LBW. However, this association was not consistent during the second and third gestational trimesters[35]. In our study, over 80% of the mothers had anemia during pregnancy (82.2% and 86.3% of cases and controls, respectively), which suggests the need for individual and public interventions in order to improve the nutritional conditions of pregnant woman in the municipality of Pasto.

There are a few studies that analyze the relationship between food insecurity and LBW, some of which are not comparable due to methodological aspects. A study conducted in Medellín, Colombia during 2014 concluded that an income below minimum wage was associated with smaller neonates compared to their gestational age, who also had LBW[36]. The authors explained that household food insecurity limits consumption of adequate nutrients during pregnancy, increasing the risk of micronutrients deficiency and, therefore, LBW. Another study carried out in Pereira, Colombia assessed nutritional status and food insecurity perception in pregnant adolescents. The authors revealed that 63.3% of participants had experienced food insecurity and were able to demonstrate an association between food insecurity and LBW[37]; however, the maternal group ages established in that study are not comparable to the people studied in this work. Among the limitations that we faced is the impossibility of measuring food insecurity through objective indicators. Nevertheless, we highlight the use of an instrument that is valid for Colombia and applicable to the Latin American region.

We think that one of the strengths of this work is the use of primary sources of information for both cases and controls. In addition, the collection of information about food security was carried out by the researcher, who was trained in medicine and pediatrics accompanied by a professional in psychology to improve empathy and obtain reliable data.

Conclusions

Household food insecurity during the last gestational trimester was not only associated but also represented the main determinant factor of LBW in mothers served in the San Pedro Hospital of Pasto. Therefore, we suggest to prioritize the policies aimed at guaranteeing food security of vulnerable populations in order to counteract the high morbidity and mortality of LBW, mainly in women of reproductive age and pregnant ones.

Conflict of interests: There are no conflicts of interest.

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