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SCIENTIFIC LETTERS

Prevalence of low birthweight and macrosomia in a private clinic in North Mexico☆

La prevalencia de bajo peso al nacer y macrosomía en una clínica privada del norte de México

Low birth weight (LBW) and macrosomia (MS) are metabolic and growth disorders seen in newborn infants. Low birth weight is defined as a weight at birth of less than 2500 g, while MS is characterized by a weight of over 4000 g or above weight percentile 90 for the gestational age of the infant.[1,2] The prevalence of MS is reported to be between 4% and 16%.[2] Low birth weight has been documented in 7–17% of all deliveries, and is more prevalent in developing countries,[2,3] reaching up to 26–28% in parts of Ethiopia.[4] Both conditions are related to specific risk factors. Low birth weight is associated to pregnancy occurring at extreme ages (under 20 or over 35 years of age), denutrition, limited socioeconomic resources, pre-existing diseases (arterial hypertension, thyroid disorders), inadequate weight gain during pregnancy, complications of pregnancy, and infections.[1–3] Macrosomia in turn is associated to maternal obesity, extreme weight gain and previous or gestational diabetes mellitus.[5] Macrosomia is associated to an increased rate of metabolic disorders. Furthermore, a relationship has been found between maternal obesity during pregnancy and certain neoplasms. Infants with LBW are more susceptible to infections and breathing difficulties.[5–7]

Although different prevalences of these disorders have been reported in the literature, little is known of the figures obtained in the private medical care setting. The aim of this study is to report the prevalence of LBW and MS in a private clinic, together with the changes in Apgar score in the first minutes of life.

A cross-sectional, descriptive observational study was carried out in *Hospital-Clínica Nova de Monterrey* (Mexico), during the period from June 2014 to July 2015. The data were collected through the review and analysis of case histories. The only inclusion criterion was delivery taking place in an institution with a protocolized care model (NOVA model), where first level care is provided by internists and the patient is referred to the Gynecology and Obstetrics Unit at the time of diagnosis of pregnancy–monitoring in turn comprising monthly visits and three ultrasound evaluations (one of a genetic nature). The detected alterations amenable to management were referred for specific control (Nutrition, Genetics, etc.). The exclusion criteria were missing data and patients staying under 4 h in the clinic. The study variables referred to the newborn infants were body weight, height and gender. In addition, birth weight was classified as low weight, normal or macrosomia, and the Apgar score was recorded in the first minute and again after 5 min. Low birth weight was defined as <2500 g according to the classification of the World Health Organization (WHO), while normal birth weight was defined as 2500–3999 g. The study was approved by the local Research Ethics Committee. Quantitative variables were reported as measures of central tendency, while qualitative variables were presented as estimated proportions or prevalences. Microsoft Excel (2007) was used.

A total of 1189 births occurring in the course of one year were analyzed. The prevalence of LBW was 2.43% (95% confidence interval [95%CI] 1.55–3.31), while that of MS was 5.13% (95%CI 3.88–6.38). In females, the prevalence of LBW was 3.22% (95%CI 2.22–4.22), while that of MS was 3.04%. In males, the prevalence of LBW was 1.51% (95%CI 0.82–2.20), while that of MS was 7.21%. The results are summarized in Table 1.

The altered Apgar scores in the first minute (score <8) differed significantly among the normal subjects (5.03), LBW (10.71) and MS (9.83) ($p < 0.001$). However, no significant differences were observed among the groups after 5 min.

The prevalence of LBW was lower than reported elsewhere (5.70–15.40%)[1,2]–this fact possibly being influenced by the existence of greater socioeconomic resources, the internal preventive medicine programs of the clinic, changes in lifestyle, physical exercise, adequate nutrition and a ''mandatory'' prenatal control program characterized by full adherence. Jones et al. observed an association between socioeconomic status and a lesser incidence of LBW. In this regard, they described the reduction of LBW as an essential strategy for reducing childhood obesity.[7]

The prevalence of MS was similar to that reported in the literature (4.70–5%).[1–5] The identification of MS is considered a risk factor for gestational diabetes mellitus, diabetes mellitus and obesity. However, this finding should be regarded as a risk for the infant, since it is associated to different metabolic disorders[3,6–9] due

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Table 1 Prevalence LBW/MS.

Variable	Total (n = 1189)	Males (n = 596)	Females (n = 593)
Low weight (%)	2.43	1.51	3.22
Normal weight (%)	92.43	91.28	94.07
Macrosomia (%)	5.13	7.21	3.04

LBW: low birth weight; MS: macrosomia.

to ''deficient genetic programming''[10] secondary to the above alterations. On correlating the Apgar score to body weight category, infants with LBW or MS show altered scores compared with infants of normal weight. Nevertheless, this difference quickly disappears, leaving no clinical repercussions.

The strengths of this study include the evaluation of a large patient sample in a private clinic with a protocolized care model that may be representative for purposes of reproducibility and the generation of new working hypotheses. The study admittedly also has many limitations, including its purely descriptive design, the cross-sectional measurement of variables, and the absence of data referred to gestational age, thereby precluding cause–effect inferences.

It therefore may be concluded that the prevalence of LBW in a private clinic in North Mexico is lower than reported in our country. In contrast, the prevalence of MS is consistent with the ranges described in the international literature.

There is a need to promote a culture of health during pregnancy, with opportune prenatal monitoring and the identification of risk factors for the development of the abovementioned disorders. Strategies should be developed contemplating individualized lifestyles and permanent continuous capacitation of all the health professionals–including nurses, physicians with first patient contact, and specialists.

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