



Applied nutritional investigation

Association between prepregnancy obesity and metabolic risk in Chilean premenopausal women 10 y postpartum



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ABSTRACT

Objectives: One of every four pregnant women in Chile is obese. Gestational obesity is associated with maternal metabolic complications in pregnancy (e.g., gestational diabetes, preeclampsia), but to our knowledge, there is little evidence on relationships with future metabolic risk. The aim of this study was to evaluate the association between prepregnancy obesity (pregnancy body mass index ≥ 30 kg/m²) or excessive gestational weight gain (GWG; according to the 2009 recommendations from the Institute of Medicine), and maternal metabolic complications 10 y postpartum in premenopausal Chilean women.

Methods: A prospective study was conducted. In 2006, 1067 Chilean mothers of children born in 2002—participants of the GOCS (Growth and Obesity Cohort Study)—were recruited. Mothers completed a questionnaire concerning sociodemographic, anthropometric, and pregnancy characteristics. Of the sample, 402 women were randomly selected to participate in a study related to the determinants of breast cancer risk in 2012. At follow-up, anthropometry, blood pressure, and fasting labs were measured. Complete data was available for 366 women.

Results: Thirty-two percent of mothers had prepregnancy overweight/obesity and 39.1% had excessive GWG. In adjusted models, prepregnancy obesity was positively associated with increased insulin resistance (odds ratio [OR], 18; 95% confidence interval [CI], 5.2–62.7), metabolic syndrome (OR, 3.3; 95% CI, 1.3–8.3), and hyperglycemia (OR, 3; 95% CI, 1.1–8.6). Prepregnancy overweight/obesity was associated with increased risk for insulin resistance, metabolic syndrome, abdominal obesity, low high-density lipoprotein cholesterol, and hypertriglyceridemia ($P < 0.05$). Excessive GWG was not associated with metabolic risk in the main model but was found to be positively associated in models with correction of weight by possible recall bias.

Conclusions: Gestational obesity was associated with maternal metabolic alterations 10 y postpartum. Prevention strategies for chronic diseases should consider prepregnancy obesity as a modifiable risk factor for future metabolic health.

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Introduction

Obesity is considered a worldwide epidemic. Every year, approximately 2.6 million people die as a result of excess weight, which disproportionately affects women [1,2]. In 2010,

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the Chilean Ministry of Health estimated that 31% of women between the ages of 15 and 44 y were overweight and 20% were obese [3]. Additionally, the prevalence of overweight/obesity among pregnant women who are beneficiaries of the Chilean public health system reached 59% in 2013, with one of every four women considered obese [4]. Prepregnancy obesity (pregnancy body mass index [BMI] ≥ 30 kg/m²) or excessive gestational weight gain (GWG; above recommendations established by the Institute of Medicine [IOM]) [5] are the most important factors in Western societies related to perinatal outcomes as gestational diabetes, preeclampsia, or macrosomia [5–9].

Prepregnancy obesity and excessive GWG are independently and positively related to maternal retention of weight and fat postpartum and obesity in the short and long terms [10–14]. However, to our knowledge, few studies, all conducted in developed countries, have previously evaluated the relationship between prepregnancy obesity and excessive GWG and future metabolic risk beyond adiposity. One study showed that after 15 y, prepregnancy obesity was related to increased risk for type 2 diabetes, metabolic syndrome (MetS), heart disease, hypertension, and dyslipidemia [15]. This relationship could be explained because among pregnant women who are obese before pregnancy, fat preferentially deposits in central locations, which could be associated with future metabolic complications [16,17]. In relation to excessive GWG, three studies found no association with metabolic risk factors such as insulin resistance (IR), lipids, glucose, and MetS [13,15,18].

Thus, the objective of the present study was to evaluate in a Latin American country that has undergone a very rapid nutrition transition, the association between prepregnancy obesity or/and excessive GWG and maternal metabolic complications (hyperglycemia, dyslipidemia, IR, and MetS), 10 y postpartum in a sample of premenopausal Chilean women from low- and middle-income communities.

Materials and methods

Study design and participants

The present study is a prospective cohort of the mothers of participant children from the GOCS study. The objectives and methods of the GOCS study have been described elsewhere [19,20]. In brief, GOCS was an ambispective cohort started in 2006 of 1196 children born in 2002, who attended public daycare centers (JUNJI) in six neighborhoods in the southeast area of Santiago, Chile. Data on participating children were collected retrospectively from pregnancy to 2006 and then prospectively followed until puberty. The sample is representative of Chilean women living in Santiago who receive public medical care (low- and middle-income individuals, which represent 70% of the Chilean population). In 2012, 483 mothers of GOCS participants were invited to participate in the study DERCAM (Determinants of Breast Cancer) study, which evaluated risk factors for breast cancer. Of the 483 mothers, 402 mothers met inclusion criteria. Exclusion criteria included not having a recent mammogram and having incomplete data. For the present analysis, complete data for 366 women was available (Fig. 1).

Data collection and measurement

Data collection was conducted at two time points, in 2006 and 2012, 10 y postpartum. In 2006, as part of the GOCS study, mothers completed a retrospective survey, reporting sociodemographic characteristics (e.g., education, marital status, occupation) and pregnancy factors (e.g., prepregnancy weight, weight at end of pregnancy, gestational diabetes, preeclampsia, habits as smoking). Gestational age at birth (gestational weeks), birth size (cm), and birth weight (g) were obtained from medical records. In 2012, as part of DERCAM

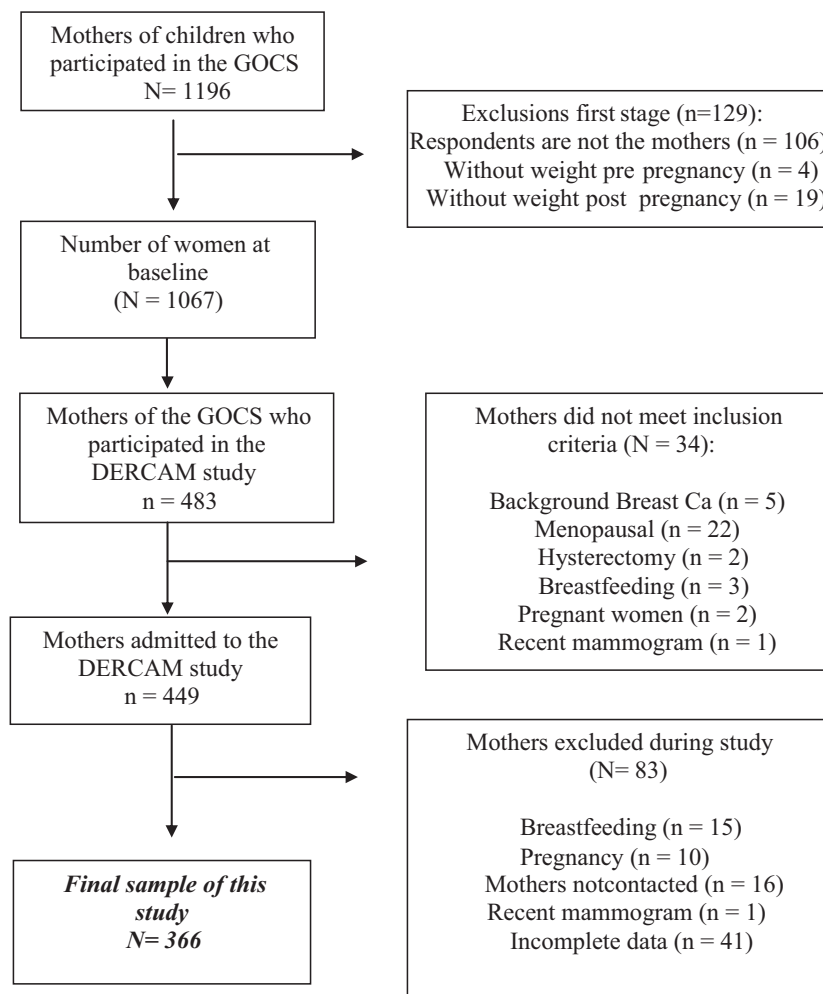


Fig. 1. Diagram of study flow. DERCAM, Determinants of Breast Cancer; GOCS, Growth and Obesity Study.

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