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Birth weight and adult cardiovascular risk in a developing southern chinese population: the Guangzhou Biobank Cohort StudyC.M. Schooling¹, C.Q. Jiang², T.H. Lam, B.J. Cowling¹, Au Yeung SL¹, WS. Zhang², K.K. Cheng³, G.M. Leung¹¹*School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong SAR;* ²*Guangzhou Occupational Diseases Prevention and Treatment Centre, Guangzhou Number 12 Hospital, Guangzhou, China;*³*Department of Public Health and Epidemiology, University of Birmingham, UK*

Birth weight is negatively associated with cardiovascular diseases and diabetes, although the underlying mechanisms are unclear. Most evidence comes from long-term industrialized populations, potentially confounded by social patterning or by subsequent exposures, including growth and final size. In developing populations birth weight is typically lower and potentially an important contributor to the growing epidemic of non-communicable chronic diseases, but the associations are less well-established and birth weight is often unavailable.

Objectives: To clarify the association of birth weight with cardiovascular risk we used birth rank as an instrumental variable for birth weight in a large sample from Southern China.

Methods: We used published data on birth weight by birth rank from an appropriate population and baseline data from the Guangzhou Biobank Cohort Study phases 2 & 3 (2005–8) to examine the adjusted associations, using instrumental variable analysis, of birth weight with clinically measured cardiovascular risk factors in older (≥ 50 years) men ($n = 5,051$) and women ($n = 13,907$).

Results: Birth weight was associated with lower blood pressure (systolic -0.25 mm Hg 95% confidence interval (CI), -0.53 to 0.03 and diastolic -0.33 , 95% CI -0.48 to -0.18 per standard deviation higher birth weight), but had little association with glucose, lipids, waist-hip ratio or body mass index, adjusted for relevant confounders (age, sex, early life environment and number of offspring).

Conclusions: Birth weight may impact blood pressure; however associations of birth weight with other cardiovascular risk factors may not be universal nor related to foetal exposures, with corresponding implications for prevention. Support: The University of Hong Kong (HKSAR), Guangzhou Public Health Bureau (China), Guangzhou Science and Technology Bureau (China), The University of Birmingham (UK).

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Birth weight, current body mass index and insulin resistance and secretion in early adult life in two Latin American populationsA.A.M. Silva¹, C.J.N. Santos¹, M.A. Barbieri², H. Bettiol², H. Amigo³, P. Bustos³, R. Rona⁴¹*Federal University of Maranhao, Brazil. Rua Barão de Itapary, 155, 65020-070, Sao Luis, Brazil;* ²*Faculty of Medicine of Ribeirao Preto, University of Sao Paulo, Brazil. Av. Bandeirantes, 3900, 14049-900, Ribeirao Preto, Brazil;*³*Department of Nutrition, Faculty of Medicine, University of Chile, Independencia 1027, Santiago, Chile;* ⁴*Department of Psychological Medicine, King's College London, Weston Education Centre, London SE5 9RJ, UK*

Objectives: The aim of this study was to evaluate the associations between birth weight (BW) current body mass index (BMI) and weight gain from birth to adult age on insulin sensitivity (IS) and insulin secretion (ISc) among two populations of young adults from developing countries.

Methods: Data from two birth cohort studies, one from Ribeirao Preto (Brazil), with 1984 participants, aged 23 to 25 years old, and the other from Limache (Chile) with 965 subjects aged 22 to 28 years old were used. Weight was recorded at the time of birth and anthropometric (weight and height) and laboratory (fasting plasma glucose and insulin) measurements were taken at adult age. IS and ISc were estimated using the updated Homeostatic Model Assessment (HOMA2) index. Four multiple linear regression models were carried out to test the associations between BW and adult BMI on log IS and log ISc. Appropriate institutional ethics committed clearance and participants' informed consent were obtained.

Results: In the early model young adults in the first birth weight tertile had a log IS 0.10 standard deviation score (SDS) lower in Brazil and 0.13 lower in Chile. This effect was small and close to statistical significance. In the late model, those in the higher BMI tertile at adult age showed log IS 0.78 SDS lower in Brazil and 0.39 SDS lower in Chile. In both countries, higher weight gain from birth to adult age reduced insulin sensitivity and the combination of low BW tertile and high adult BMI tertile reduced IS even more only in Brazil. Among Brazilians, those in the low BW tertile presented higher ISc. Adults in the high BMI tertile showed log ISc 0.83 SDS higher in Brazil and 0.66 SDS higher in Chile. High weight gain from birth to adult age and the interaction between low BW tertile and high BMI tertile increased insulin secretion in Brazilians only.

Conclusions: Low birth weight tertile and weight gain from birth to adult age were associated with low IS in both countries and with high ISc in Brazil only. High BMI tertile was associated with low IS and high ISc in both countries. The interaction between low BW tertile and high BMI tertile reduced insulin sensitivity and increased insulin secretion among Brazilians only. In those populations of young adults high compensatory ISc was observed among those presenting low insulin sensitivity and high BMI. Support: CNPq, FAPESP and FAEPA (Brazil) and Fondecyt (Chile).