

during pregnancy affect fetal brain development; infants born to deficient mothers show symptoms like irritability and failure-to-thrive.² Furthermore, vitamin B₁₂ has been reported to be successful in the treatment of sleep-wake rhythm disorders.³ This explorative study is the first to examine whether 1) maternal vitamin B₁₂ and folate status during pregnancy are associated with excessive infant crying, and 2) whether this association is modified by the presence of psychosocial problems during pregnancy.

Methods: From January 2003 till March 2004, all pregnant women in Amsterdam were approached during their first prenatal visit (± 13 weeks of gestation); 8266 women (response rate 67%) filled out a questionnaire covering sociodemographic data, lifestyle and (psychosocial) health; 4389 women also provided a blood sample for biomarker analyses. A few months (± 3) after delivery, 5132 women filled out a second questionnaire about the health of mother and infant. Vitamin B₁₂ and folate concentrations were determined in serum, standardized for gestational age at blood sampling and then categorized into quintiles (Q1–Q5). Infant crying was measured by the question: ‘How many hours per day (24 hours) on average did your baby cry in the past week?’ Excessive crying was defined as crying ≥ 3 hours per day on average in the past week. The following maternal psychosocial problems were measured by self-report: depressive symptoms, anxiety, pregnancy-related anxiety, jobstrain, and parenting stress. For this study, multiple births were excluded. Finally, complete data were available for respectively 2944 (vitamin B₁₂ analyses) and 2644 (folate analyses) women. Appropriate institutional ethics committee clearance and participants’ informed consent were obtained.

Results: The prevalence of excessive infant crying in our sample was 3.4%. Logistic regression analyses showed that vitamin B₁₂ concentration was significantly associated with excessive crying, univariate as well as multivariate (adjusted for ethnicity, education, maternal age, parity and maternal smoking) (Q1:OR = 3.59[1.58–8.16]; Q2:OR = 2.63[1.12–6.17]; Q3:OR = 2.73[1.17–6.41]; Q4:OR = 2.75[1.18–6.42]; Q5:reference group). Stratified analyses showed a much stronger association between vitamin B₁₂ concentration and excessive crying among women who experienced one or more psychosocial problems during pregnancy compared to women who did not. Folate concentration was not significantly associated with excessive crying.

Conclusions: This explorative study showed that maternal vitamin B₁₂ status during early pregnancy is associated with excessive infant crying in the first months after birth. This association is modified by the presence of maternal psychosocial problems during pregnancy. Maternal folate status is not associated with excessive infant crying.

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Life long oestrogen exposure and later adulthood cognitive function in naturally post menopausal women from Southern China: The Guangzhou Biobank Cohort Study

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Objective: In animal and in vitro studies oestrogen has both neurotrophic and neuroprotective properties. Epidemiological evidence is inconclusive, but suggests a positive association between reproductive period and later life cognitive function. We examined the interrelationships of several reproductive milestones, all proxies of endogenous oestrogen exposure, with cognitive function in a large cohort of older Southern Chinese women.

Methods: Structural equation modeling (SEM) was used in a cross-sectional study of naturally post menopausal older (≥ 50 years) Chinese women from the Guangzhou Biobank Cohort Study (phases 2 and 3) to examine the interrelationship of age of menarche, age of menopause, age of first pregnancy, parity and duration of breast feeding with cognitive function assessed by the immediate and the delayed 10-word recall task in 10,875 women (phases 2 and 3) and the mini-mental state examination (MMSE) in 5,235 women (phase 3).

Results: Earlier age of menarche and later age of menopause were associated with better cognitive function on all three outcomes, adjusted for age, education, childhood and adulthood socio-economic position and current physical activity: one year earlier age of menarche was associated with 0.02 (95% confidence interval 0.008 to 0.03) more words on the 10-word delayed recall task and one year later menopause with 0.02 (0.004 to 0.03) more words. Lower parity, younger age at first pregnancy and shorter duration of breast feeding were also associated with better cognitive function and did not affect the associations of age of menarche or menopause with cognitive function. Further adjusting for adiposity (waist hip ratio and body mass index), skeletal growth (leg length and sitting height) and cardiovascular risk factors (blood pressure, lipid profile and fasting plasma glucose) did not change the pattern of results.

Conclusion: In a large cohort of naturally postmenopausal women from a population with very different socio-cultural and reproductive histories to those usually studied, we found most proxies of higher endogenous oestrogen exposure associated with better cognitive function. Greater endogenous oestrogen exposure throughout the life course may have long

lasting benefits for cognitive development and maintenance, with corresponding implications for healthy aging. These findings support the biological evidence for a cognitively protective role of endogenous oestrogen and may add insight to the ongoing debate regarding the cognitive effects of Hormone Replacement Therapy. However, any attempts to modify these factors will need to consider any potential detrimental effects, such as increased risk of cardiovascular disease and breast cancer with younger age of menarche and loss of the beneficial effects of breast feeding for the mother and baby. Acknowledgements: 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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Is better nutrition in childhood in a developing population associated with better cognitive function in later adulthood?: The Guangzhou Biobank Cohort Study

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Objective: There is growing evidence that early life exposures, such as childhood socioeconomic status, are related to later adulthood cognition. However, the specific aspect of early conditions underlying this association is not clear. Animal protein intake is positively associated with earlier walking in infants. Dietary supplementation with meat in infants and children in developing countries results in better cognitive function, independent of iron status. Protein energy supplementation with vegetables, milk and sugar (not meat) given from birth to 24 months in developing populations is associated with better cognitive function in early adulthood (mean age 32 years), especially amongst women. Inadequate childhood nutrition is associated with poor short term academic and cognitive outcomes. However, it is not known whether childhood nutrition has life long effects on cognitive function. We examined the association of childhood meat eating with adulthood cognitive function in southern China where the older population lived through significant hardship during their early years.

Methods: Multivariable linear regression was used in a cross-sectional study of 20,086 Chinese men and women aged ≥ 50 years from the Guangzhou Biobank Cohort Study (phases 2 and 3) 2005–8. We assessed the association of childhood meat eating with amnesic-MCI and delayed 10-word recall

score. The 10-word recall is a test of new learning ability from the CERAD (Consortium to Establish a Registry for Alzheimer's Disease) test battery which has been validated as a culturally and educationally sensitive tool for identifying dementia in population based research in developing countries. Amnesic-MCI was defined as a delayed recall score of 3 or less out of 10, corresponding to 1 standard deviation below the mean.

Results: Adjusted for age, sex and education, childhood meat eating 1–6 days per week and daily childhood meat eating were associated with a higher 10-word recall score (number of words recalled = 0.08 [95% confidence interval = 0.02 to 0.13] and 0.24 [0.16 to 0.33] respectively) and with lower odds of amnesic-MCI (odds ratio = 0.80 [95% confidence interval = 0.72 to 0.89] and 0.79 [0.67 to 0.94] respectively). Additional adjustment for childhood and adulthood socioeconomic position and current physical activity attenuated these findings, however daily childhood meat eating remained associated with a higher 10-word recall score (0.17 [0.08 to 0.26]).

Conclusions: A diet that includes a small amount of daily meat in childhood (after infancy) may have long-term positive effects on cognitive function. If confirmed, these results highlight the importance of adequate childhood nutrition. Alternatively childhood meat eating may reflect a generally more cognitively protective childhood environment and nutrition. Irrespective, these findings also emphasise the childhood and adolescent antecedents of adult disease, with corresponding public health implications for healthy aging. Future research should examine the role of childhood exposures in long term cognitive development and if a role for childhood meat eating is verified, should elucidate the type and quantity of macro and micro nutrients that may be cognitively protective and the biological mechanisms behind these effects, so that preventive strategies can be implemented. Acknowledgements: 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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Transgenerational effects of prenatal synthetic glucocorticoid exposure on molecular regulation of the pituitary gland

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Objective: Approximately 10% of pregnant women are at risk of preterm labour. Almost 50% of infants born preterm develop respiratory distress syndrome (RDS). Pregnant women at risk of premature delivery are administered