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Prospective Evidence that Lactation Protects Against Cardiovascular Disease in Women

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In this issue of the Journal, the article by Stuebe and colleagues, “Duration of lactation and incidence of myocardial infarction in middle-to-late adulthood”, presents the first evidence that lifetime lactation may influence the onset of cardiovascular events in women beyond the childbearing years. Their findings extend previous work establishing that lactating women exhibit more favorable cardiometabolic profiles (i.e., higher HDL-cholesterol, lower triglyceride and glucose levels) than non-lactating women. Their findings are also consistent with recent evidence showing that the favorable effects on risk factor profiles persist post-weaning. Specifically, on average at 13 months post-weaning, plasma HDL-C levels were 6 mg/dl higher among women who had lactated for 3 months or more versus less than 3 months adjusted for preconception measurements and other confounders.(1) In the same cohort, longer duration of lactation was associated with non-significant trends for smaller waist girth and lower body weight, fasting plasma triglycerides, low-density lipoprotein cholesterol (LDL-C) and glucose levels.(1) Another longitudinal study found that higher postpartum HDL-C levels were maintained at two months post-weaning, while decrements in triglyceride, LDL-C, and total cholesterol levels were not maintained post-weaning.(2)

In their analysis of the Nurse's Health Study cohort, Steube and colleagues report that compared to women who never lactated, lifetime lactation of two or more years was associated with a 23 percent lower incidence of myocardial infarction decades later. The protective association was found primarily among women aged 50 years or older who had given birth within the past 30 years, and was characterized by a threshold effect at 24 months of lactation rather than an graded inverse linear reduction in risk with increasing cumulative duration of lactation. Both parity and average length of lactation per birth may have affected the protective association in this cohort. Although, 60 percent of the cohort gave birth to at least three children, 70 percent lactated for a total of less than 6 months. Thus, primiparas and other parity groups would have been unlikely to experience two or more years of lactation. Therefore, the findings inform risk status among multiparas who generally lactated for shorter periods of time per birth. An important question that remains unanswered by this study is whether extended duration of lactation for one or two pregnancies confers the same protection as multiple periods of shorter durations for several pregnancies. The authors concede that they were unable to determine

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All authors declare that the answer to the questions on your competing interest form are all No and therefore have nothing to declare

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whether the protective association of lactation with coronary heart disease (CHD) risk varied by parity given the limited data within lower parity groups and lactation duration categories.

The question of whether the lactation and CHD association varies by parity is particularly relevant given that the authors had previously reported that lactation for four or more months was associated with 25 percent lower incidence of self-report of type 2 diabetes in the same cohort.(3) Cross-sectional epidemiologic studies have also reported that lactation may have long-term benefits for women's cardiometabolic health. In these studies, one month of lactation or ever lactating was associated with including 21-22 percent lower odds of the prevalence of the metabolic syndrome among women in mid to later life.(4;5) What is notable about findings from these studies is that a much shorter duration of lifetime lactation associated with lower disease risks later in life women.

For lactation-disease association studies, selection bias is a possible source of confounding because women who decide to breastfeed their children are likely to have better health status and practice healthier lifestyles than women who formula feed. Moreover, another limitation of these studies is that none measured risk factors were not measured before pregnancies, or reported pregnancy complications. Measurement of preconception or post-delivery risk factors, and classification by pregnancy complications (i.e, pre-eclampsia, gestational diabetes) may reduce confounding in the lactation-disease association. Because most studies have been conducted in primarily Caucasian women it is unclear whether the findings on lactation and incident CHD will generalize to multi-race/ethnicity groups or to women who bear fewer children but lactate for longer periods of time per birth.

These considerations highlight the importance of elucidating the mechanisms through which lactation may affect CVD risk factors. Lactating women exhibit lower plasma glucose and insulin levels, a less atherogenic lipid profile, more rapid postpartum declines in total cholesterol and triglycerides and greater fat mass mobilization during the first year postpartum than non-lactating women.(6-8) In Brazilian women at 12-18 months postpartum (67 percent still lactating) prolonged lactation was associated with a smaller area under the insulin curve, possibly protecting future insulin secretion(9). Yet, these favorable effects on risk factors may not be mediated by weight loss, given the equivocal evidence regarding lactation and postpartum weight retention.(10;11) A possible mechanism is that lactation may reduce central adiposity given that fat is preferentially from the suprailiac and subscapular regions.(12) Yet, few studies have examined whether these favorable affects persist post-weaning or controlled for confounding by preconception risk factor status, lifestyle behaviors and weight gain. Because Stuebe and colleagues did not measure changes in CHD risk factors (e.g., lipids and metabolic indices) one cannot determine whether the mechanisms differ that explain the observed protective associations.

Breastfeeding rates have changed dramatically during the past 50 years. Currently, 80% of U.S. women initiate lactation, but 45% percent report "any" breastfeeding their infants at 6 months of age. Thus, improving lactation rates has substantial potential for a positive impact on women's health. Breastfeeding may have beneficial effects on long-term health, for both mothers and their children. Lactation has favorable effects on cardiometabolic risk factor levels that persist after weaning, and may reduce the risk of developing CHD and type 2 diabetes mellitus in mid to late life. However, data are not available within the same cohort that directly link lactation to persistent changes in cardiometabolic risk factors (i.e., plasma lipids, glucose and insulin, and central adiposity) as well as subclinical disease or disease events. These data have been largely unavailable because of the extended time period between the reproductive years and CHD onset in women.

In their prospective study, Stuebe and colleagues report that extended duration of lactation may confer modest protection against coronary heart disease for women. Their findings provide the impetus for investigation of the mechanisms by which lactation may influence affect women's cardiometabolic health. Studies are needed that examine the intensity as well as duration of lactation, and to determine whether the protective association applies to women with high risk pregnancies (i.e., glucose intolerance or pre-eclampsia in pregnancy). Future study designs must overcome the challenge of confounding by maternal risk factor profiles, and examine whether the association varies by parity. The study generates important new inquiry into the lasting effects of lactation on women's heart health.

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