

Birthweight and Risk for Type 2 Diabetes

Rich-Edwards JW, Colditz GA, Stampfer MJ, Willett WC, Gillman MW, Hennekens CH, et al. Birthweight and the risk for type 2 diabetes mellitus in adult women. *Ann Intern Med* 1999;130(4 Pt 1):278-84.

Study Overview

Objective. To examine the association between birthweight and type 2 diabetes in a large cohort of adult women while controlling for potential explanatory factors in childhood and adulthood.

Design. Cohort study.

Setting and participants. The Nurses' Health Study: 121,701 women in the United States born between 1921 and 1946 who have been followed by questionnaire since 1976. The authors examined data on 69,526 women who were free of diabetes at baseline (1976) and reported their birthweight on the 1992 questionnaire.

Main outcome measures. Confirmed type 2 diabetes diagnosed any time from 1976 to 1992.

Main results. Low birthweight was associated with increased risk for type 2 diabetes. After adjusting for age, adult body mass index, and maternal history of diabetes, an inverse association across the entire range of birthweight was apparent. Compared with the reference group of birthweight 7.1 to 8.5 lb, relative risks by ascending birthweight category were 1.83 (95% confidence interval [CI], 1.55 to 2.16) for birthweight less than 5.0 lb, 1.76 (CI, 1.49 to 2.07) for birthweight 5.0 to 5.5 lb, 1.23 (CI, 1.11 to 1.37) for birthweight 5.6 to 7.0 lb, 0.95 (CI, 0.82 to 1.10) for birthweight 8.6 to 10.0 lb, and 0.83 (CI, 0.63 to 1.07) for birthweight of more than 10 lb (*P* for trend < 0.001). Adjustment for ethnicity, childhood socioeconomic status, and adult lifestyle factors did not substantially alter this association, which was strongest among women whose mothers had no history of diabetes.

Conclusion

Lower birthweight is associated with increased risk for type 2 diabetes during adulthood.

Commentary

Previous studies have shown that low birthweight is associated with increased risk for type 2 diabetes, impaired glucose tolerance, and elevated serum insulin levels in adults

[1-3]. This study, the largest of its kind, suggests that an inverse association between birthweight and risk for adult diabetes exists across the range of birthweights and is not restricted to the smallest infants. It also adds to the increasingly large body of medical literature supporting an inverse relationship between birthweight and the incidence of adult illnesses such as hypertension [3,4], cardiovascular disease [4,5], and breast cancer [6].

Applications for Clinical Practice

These findings do not indicate that low birthweight causes adult diabetes but instead suggest that there are factors (eg, prenatal nutrition) affecting both prenatal growth and risk for type 2 diabetes in adulthood. Because the clinical mechanisms behind the statistical association between birthweight and risk for adult diseases remain unclear, it is appropriate to maintain current guidelines for maternal diet and nutrition during pregnancy. In the meantime, researchers must continue to study the association between birthweight and future risk for type 2 diabetes as well as prenatal nutrition and other possible in utero determinants of birthweight and risk for type 2 diabetes.

References

1. Hales CN, Barker DJ, Clark PM, Cox LJ, Fall C, Osmond C, Winter PD. Fetal and infant growth and impaired glucose tolerance at age 64. *BMJ* 1991;303:1019-22.
2. Robinson S, Walton RJ, Clark PM, Barker DJ, Hales CN, Osmond C. The relation of fetal growth to plasma glucose in young men. *Diabetologia* 1992;35:444-6.
3. Curhan GC, Willett WC, Rimm EB, Spiegelman D, Ascherio AL, Stampfer MJ. Birth weight and adult hypertension, diabetes mellitus, and obesity in US men. *Circulation* 1996;94:3246-50.
4. Barker DJ, Osmond C, Golding J, Kuh D, Wadsworth ME. Growth in utero, blood pressure in childhood and adult life, and mortality from cardiovascular disease. *BMJ* 1989;298:564-7.
5. Osmond C, Barker DJ, Winter PD, Fall CH, Simmonds SJ. Early growth and death from cardiovascular disease in women. *BMJ* 1993;307:1519-24.
6. Michels KB, Trichopoulos D, Robins JM, Rosner BA, Manson JE, Hunter DJ, et al. Birthweight as a risk factor for breast cancer. *Lancet* 1996;348:1542-6.

Copyright 1999 by Turner White Communications Inc., Wayne, PA. All rights reserved.