Diabetes: Too Big and Too Bad to Ignore Any Longer

Reviewed by Matthew C. Riddle, MD

STUDY

Narayan KM, Boyle JP, Thompson TJ, Sorensen SW, Williamson DF: Lifetime risk for diabetes mellitus in the United States. *JAMA* 290:1884–1890, 2003

SUMMARY

Objective. To estimate the lifetime risk of developing diabetes for people of various ages and the expected effects of diabetes on their life expectancy.

Design and methods. Researchers developed a predictive model, the main dataset for which was derived from an ongoing cross-sectional survey of the U.S. population, which included 120,000 individuals in the year 2000, with additional information from earlier years. Information on mortality rates from U.S. Census Bureau records was also included, as well as diabetes-specific mortality rates from a smaller regional study. The resulting model was extended using a number of conservative assumptions to project the incidence of diabetes and its effects on mortality into the future.

Results and conclusions. The findings were striking. The lifetime risk of developing diabetes for an individual born in the United States in 2000 was estimated to be 33% for men and 39% for women. Risk was lowest for the subpopulation identified as "white" (27% for men and 31% for women) and somewhat higher for those described as "black" and "other" (presumably those of Asian, Pacific Islander, or mixed ethnicity). The highest risk was found in the subgroup identified as "Hispanic" (45% for men and 53% for women). For people already 50 years old and not known to have diabetes, the predicted rates were still remarkably high: 26% risk of developing diabetes for men and 28% risk for women. At age 50 and older, the nonwhite population continued to have more risk than the others, and Hispanic women continued to have the highest risk: 44% likelihood of developing diabetes.

The predicted increase of mortality rates after diagnosis of diabetes was also impressive. Children (either boys or girls) developing diabetes in 2000 at age 10 were predicted to live about 19 fewer years than they would have without diabetes. Assuming that diabetes reduces the quality as well as duration of life, the loss of quality-adjusted life years (QALYs) for such children was predicted to be 31 for boys and 33 for girls. When diagnosed with diabetes at age 50, men were predicted to lose about 9 years of life and 15 QALYs, and women were predicted to lose 12 years and 18 QALYs.

The authors concluded that prevention of diabetes and prevention of its complications are important public health priorities.

COMMENTARY

This article by epidemiologists from the Centers for Disease Control and Prevention describes a simple yet powerful analysis with far-reaching implications. A commentary on its findings presents the challenge of where to start.

The limitations of the findings should come first. Models depend on the quality of data and the accuracy of assumptions. The data here derived from a population-based effort that has been underway for more than a decade. However, the main data were collected by telephone survey, a method with obvious limitations.

Concerning their assumptions in the model, the authors make a persuasive case that their analysis probably underestimates, rather than exaggerates, the present and future harm from diabetes. For example, they chose not to anticipate the continuing increase of obesity with its certain effects on diabetes. A repeat analysis in 2010 might predict even higher risks.

Perhaps the weakest part of the model concerns quality of life, which is subjective and varies markedly among individuals. Although a 25% reduction in quality of life from diabetes may be a fair overall assumption, it fails to reflect the profound impairments (loss of vision, limbs, mobility, or mental function) that can result from various complications of diabetes in less-fortunate individuals. Moreover, further study (for example, of impairment of mental function)[1] may add weight to the evidence that quality, as well as quantity, of life is reduced by diabetes.

Accepting these unavoidable limitations of the model, however, its predictions remain staggering. They certainly refute the view that diabetes is an unimportant disorder with little significance for personal and national health planning. As the authors point out, breast cancer occurs in one of eight women and one of 16 of the entire population[2] and receives outstanding and well-deserved media coverage and financial support. People literally march in the streets to

confront this important problem. In contrast, diabetes is expected to occur in more than one in three people born in this country, yet it attracts much less interest. If diabetes were a trivial problem, its high incidence might not matter. But the second part of the analysis dispels this view. The most notable prediction in this article may be the projected loss of 9 years of life for men and 12 for women who learn they have diabetes at age 50, a typical age of diagnosis. This observation confirms and updates earlier studies,[3] while relating the substantial loss of life-years to the very high lifetime risk of diabetes.

Writings on health economics include efforts to define the monetary value of health and illness. Medical efforts can be rated according to the cost of preserving one QALY.[4] Estimates range from $20,000 to $50,000 per QALY saved as an appropriate level of expense. Consider, then, the potential value of 18 QALYs expected to be lost by an average 50-year-old woman just diagnosed with diabetes. At $50,000 per QALY, that comes to $900,000. Much could be done to prevent or delay the onset of diabetes or its complications with less money than that.

The authors were cautious in judging the significance of their findings, but a much more vigorous statement seems justified. If more than one in three people born in the United States will develop diabetes, and if each may lose a decade of life or more, why do we not have a clear public health policy for this disorder? Exhortation to eat less and exercise more has not worked in medical practice and will not work as public policy. These findings justify nationwide efforts to prevent diabetes and minimize its complications, notably by assuring that all people at risk (that is, everyone) have access to preventive and therapeutic health services.

REFERENCES

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