



Controversy

The folly of population screening for type 2 diabetes

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‡ Articles under the Controversy flag appear in the form of a debate. An invited response to Dr. Marshall's article, by Drs. Hertzler C. Gerstein and Sara Meltzer, begins on page 1593. Rebuttals follow on page 1595.

In 1994 the Canadian Task Force on the Periodic Health Examination concluded that there was fair evidence not to screen the general adult population for diabetes mellitus (grade D recommendation).¹ In 1996 the US Preventive Health Services found insufficient evidence to make a recommendation for or against such screening (grade C recommendation).² In 1997 the American Diabetes Association³ and in 1998 the Canadian Diabetes Association⁴ recommended that the entire adult population over the age of 45 be screened for diabetes. The Canadian Diabetes Association specified that this recommendation was based on opinion, not evidence.⁴

In the absence of evidence, why make such a recommendation? The argument for doing so is the estimate that 30% to 50% of cases of type 2 diabetes are undiagnosed,⁴ and that detecting these cases might help to prevent illness and death. But such an undertaking is acceptable only if there is reasonable evidence that a significant number of people will benefit⁵ and if the potential benefits clearly outweigh the harms.^{6,7} Screening the entire adult population over the age of 45 for diabetes does not meet these criteria.

The therapeutic interventions of choice for most patients with type 2 diabetes are diet and exercise, with the aim of decreasing body weight and insulin resistance. Since it is well documented that very few people are able to achieve and maintain weight loss,^{8,9} it is wishful thinking to suppose that screening for diabetes will make people change their lifestyles.

If screening does not lead to weight loss, could it lead to earlier intervention with intensive pharmacological therapy to decrease the risk of macrovascular and microvascular disease? Although no published studies have dealt specifically with this issue, the results of the United Kingdom Prospective Diabetes Study (UKPDS)¹⁰⁻¹² suggest that earlier pharmacological interventions are unlikely to diminish the risk of clinically significant diabetic complications.

The UKPDS documented that intensive treatment of type 2 diabetes with insulin or sulfonylureas over a 10-year period did not decrease illness or deaths from macrovascular causes — a rather discouraging result, in view of the fact that 60% of people with diabetes die as a result of macrovascular complications.¹⁰ A ray of hope comes from

another UKPDS report, which showed that intensive metformin therapy for obese people with type 2 diabetes decreased the risk of macrovascular disease. Unfortunately, such patients treated with a combination of metformin and sulfonylureas had higher rates of death compared to controls who received conventional therapy.¹¹ Although tight glucose control using insulin or sulfonylureas therapy does not by itself decrease the risk of macrovascular disease, aggressive treatment of other risk factors such as hypertension¹³ or dyslipidemia¹⁴ in type 2 diabetes *does*. However, because the assessment of blood sugar should be an integral part of the work-up of patients with hypertension or dyslipidemia, it seems unlikely that screening the general population for diabetes would be of additional value.

Microvascular complications develop far less frequently in people with type 2 diabetes than do macrovascular complications.¹⁵ The UKPDS reported a 25% reduction of microvascular disease with intensive treatment; this was measured primarily by a surrogate outcome, namely, a decrease in the progression of retinopathy as determined by ophthalmologic examination. No difference was seen in the more important clinical outcome of vision loss between patients treated intensively and those who received conventional treatment. One small benefit of intensive treatment was that, on an annual basis, 1 in 323 patients were able to avoid retinal photocoagulation. Intensive treatment did not prevent the development of impotence.¹⁰

It seems unlikely that population screening for diabetes would decrease the incidence of blindness. In the UKPDS, retinopathy at the time of clinical diagnosis was mild in over 92% of cases among men and in 95% of cases among women, and in the remaining cases it was moderate. No cases of advanced retinopathy (preproliferative or proliferative) requiring photocoagulation were detected. Many people who had moderate retinopathy also had hypertension,¹² but if testing for diabetes is indeed included as an integral part of the work-up for hypertension, the retinopathy should have been detected at that time.

The complications of established diabetes are extremely serious. Primary prevention of type 2 diabetes and its main complications is the ideal therapeutic intervention — plenty of exercise and a sensible diet — but one doesn't have to be screened for diabetes to be aware of this. Obviously, patients with other conditions such as hypertension or known hyperlipidemia that put them at risk for cardiovascular disease should be assessed for diabetes and vigorously treated for all detected risk factors.



There is no evidence that screening the entire adult population over the age of 45 for diabetes will decrease morbidity or mortality. What is certain is that screening will do a great deal of harm. Not only will thousands of Canadians who thought they were well find out they are sick, but our society as a whole will be subjected to yet another voice fostering our burgeoning and anxiety-provoking obsession with health.^{6,16-23}

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Preventive medicine in people at high risk for chronic disease: the value of identifying and treating diabetes

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Articles under the Controversy flag appear in the form of a debate. Drs. Gerstein and Meltzer were asked to respond to Dr. Marshall's article (page 1592). Rebuttals follow on page 1595.

Both diagnosed and undiagnosed diabetes are strong risk factors for chronic disease and significant morbidity and mortality. Indeed the fasting and 2-hour plasma glucose levels of 7.0 and 11.1 mmol/L that define diabetes were identified from population-based studies in which adults with both diagnosed and undiagnosed diabetes were screened with a glucose tolerance test.^{1,2} The incidence and prevalence of eye and kidney disease was markedly higher among people whose glucose levels were

above these cut-offs than among those with lower glucose levels. Large surveys have shown that people with undiagnosed diabetes have a rate of macrovascular disease and mortality that equals that of people with diagnosed diabetes, have comparable rates of treatable risk factors such as hypertension and hyperlipidemia, and may have higher rates of smoking than people with diagnosed diabetes.³ They also already have evidence of diabetic eye and nerve disease at the time of diagnosis of type 2 diabetes.³ The fact that even prediabetic levels of hyperglycemia predict a higher rate of cardiovascular disease than in the general population further highlights the importance of undiagnosed diabetes as a risk factor for chronic disease.⁴