Evaluation of lowering the age to start screening asymptomatic adults in Brazil using HbA1c results

Authors: J. Myers,[1] M.B. Toralles,[2] A.B. Fernandes,[3] [1]Bio-Rad Laboratories, Inc., Hercules, CA, USA, [2]DNA LAB, Salvador, Brazil, [3]Laboratório Lustosa, Belo Horizonte, Brazil

Background

Globally, there are approximately 537 million adults aged 20–79 living with diabetes. Almost 1 in 2 (240 million) adults living with diabetes is undiagnosed.[1] In Brazil, almost 1 in 3 (15.7 million) adults (20–79 years) living with diabetes is undiagnosed.[1]

When prediabetes is diagnosed early, there is time for intervention before the development of type 2 diabetes and its complications. The Brazilian Diabetes Society follows similar guidelines to the American Diabetes Association (ADA) for diagnosing diabetes. The Brazilian Diabetes Society recommends beginning screening asymptomatic adults from age 45.[2] In January 2022, the ADA lowered the age to begin screening asymptomatic adults from 45 to 35 years. This retrospective study will assess the impact of lowering the age of diabetes screening in asymptomatic adults to 35 years in a Brazilian population by evaluating the results when an HbA1c test is added to a fasting plasma glucose test order.

Methods

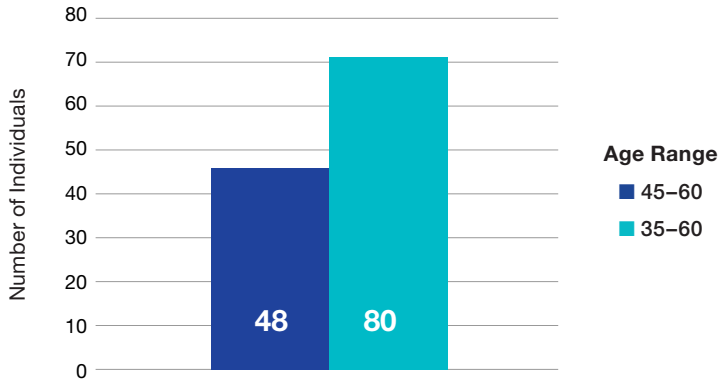
Patients in the study attended three different clinics–DNA LAB based in Salvador, Bahia, Laboratório Lustosa in Belo Horizonte, Minas Gerais, and UNIMED in São Carlos, São Paulo–from May 2021 to October 2021. The patients were attending the clinic for either an annual physical or for an unspecified medical concern. All patients who had an order for a fasting plasma glucose test were asked if they would like to participate in a study to identify the risk for developing diabetes. Those who agreed to participate were tested for both fasting plasma glucose and %HbA1c. The data reviewed included age, fasting plasma glucose (mg/dL), and %HbA1c. There were 839 patients ranging in age from 30 to 60 years of age in the study.

Fasting plasma glucose was measured using hexokinase enzymatic glucose methods on a Roche cobas c501 system with a non-diabetic range of 60-90 mg/dL at one site, an Abbott ARCHITECT system with a non-diabetic range of 60-100 mg/dL at another site, and a Siemens Atellica system with a non-diabetic range of 60-100 mg/dL at the third site. %HbA1c was measured using ion-exchange HPLC systems, the Bio-Rad Laboratories VARIANT™ II TURBO Hemoglobin Testing System at two sites and the Bio-Rad Laboratories D-10 Hemoglobin Testing System at another site. Both HPLC systems used a non-diabetic range of ≤5.6% HbA1c, the prediabetic range from 5.7–6.4% HbA1c, and the diabetic range of ≥6.5% HbA1c. The HbA1c methods selected were IFCC and NGSP certified, met the criteria for diagnosing diabetes, and were able to reveal hemoglobin variants.

Study Results

Of the 839 patients in the study, 189 had fasting plasma glucose results outside of the normal range. The HbA1c results of the remaining 650 patients with normal fasting plasma glucose results were evaluated to determine if adding an HbA1c test was able to identify individuals at risk for developing diabetes. The data was assessed for individuals from the original screening age of 45 through 60 compared with individuals in the lowered age range from 35 through 60.

In the 45–60 screening age group, 48 of 650 patients had results within the prediabetic or diabetic range–46 were prediabetic and 2 individuals (aged 50–60) were diabetic. Of those in the lowered age range (aged 35–60), 78 of 650 were prediabetic and 2 individuals (aged 50–60) were diabetic. In both age ranges, the added HbA1c test identified more individuals than with normal fasting plasma glucose alone–7% more, or 48 individuals, in the 45–60 age range, and 12% more, or 80 individuals, in the 35–60 age range. Additionally, 10 patients under the age of 35 had HbA1c results in the prediabetic range.



	Age Range		
	45–60	**35–60**	**30–60**
Individuals with prediabetes (HbA1c = 5.7–6.4%)	46	78	88
Individuals with diabetes (HbA1c = ≥6.5%)	2	2	2
Total	**48**	**80**	**90**

Conclusion

Beginning screening for diabetes at age 35 and adding an HbA1c test is useful in detecting more at-risk, asymptomatic adults for prediabetes than testing with fasting plasma glucose alone. Individuals at risk of developing diabetes can be treated earlier to prevent or delay complications.

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