Handgrip strength shown to identify people at high risk of type 2 diabetes

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Credit: University of Bristol

A simple test such as the strength of your handgrip could be used as a quick, low-cost screening tool to help healthcare professionals identify patients at risk of type 2 diabetes. In new research, scientists at the universities of Bristol and Eastern Finland measured the muscular handgrip strength of 776 men and women without a history of diabetes over a 20-year period and demonstrated that the risk of type 2 diabetes was reduced by around 50 percent for every unit increase in handgrip strength value. The findings are published today in *Annals of Medicine*.

Diabetes in all forms is the ninth major cause of death in the world. Around 90 percent of people with diabetes have type 2 diabetes. In the UK alone, one in ten people over 40 are now living with a diagnosis of type 2 diabetes. It is expected that if nothing changes, more than five million people will have developed diabetes by 2025.

Though older age, obesity, family history and lifestyle factors such as physical inactivity, smoking, unhealthy diet and excessive alcohol contribute substantially to the risk of developing type 2 diabetes, these factors alone do not explain all of the risk for type 2 diabetes. It appears other factors may be involved. Reduced muscular strength, which can be measured by handgrip strength, has consistently been linked to early death, cardiovascular disease, and disability.

Until recently, there was inconsistent evidence on the relationship between handgrip strength and type 2 diabetes. In a recent literature review of ten published studies on the topic the same researchers demonstrated that people with higher values of handgrip strength had a 27 percent reduced risk of developing type 2 diabetes.

However, while findings from this review suggested handgrip strength could potentially be used to predict type 2 diabetes, researchers needed to test this formally using individual patient data. In this latest study, the researchers from Bristol Medical School and Eastern Finland's Institute

of Public Health and Clinical Nutrition followed 776 men and women aged 60-72 years without a history of diabetes over a 20-year period and measured the power of their hand grip strength using a handgrip dynamometer. Patients were asked to squeeze the handles of the dynamometer with their dominant hand with maximum isometric effort and maintain this for five seconds.

An analysis of the results demonstrated that the risk of type 2 diabetes was reduced by about 50 percent for every unit increase in handgrip strength value. This association persisted even after taking into account several established factors that can affect type 2 diabetes such as age, family history of diabetes, physical activity, smoking, hypertension, waist circumference and fasting plasma glucose. When information on handgrip strength was added to these established factors which are already known to predict type 2 diabetes, the prediction of type 2 diabetes improved further.

According to lead author Dr. Setor Kunutsor from Bristol's Musculoskeletal Research Unit: "These findings may have implications for the development of type 2 diabetes prevention strategies. Assessment of handgrip is simple, inexpensive and does not require very skilled expertise and resources and could potentially be used in the early identification of individuals at high risk of future type 2 diabetes."

Importantly, the findings appeared to be marked in women compared to men in sex-specific analyses, suggesting that women are likely to benefit from the use of this potential screening tool.

Principal investigator, Professor Jari Laukkanen from the University of Eastern Finland, added: "These results are based on a Finnish population. Given the low number of events in our analyses, we propose larger studies to replicate these findings in other populations and specifically in men and women." The authors add that further research is needed to

establish whether efforts to improve muscle strength such as resistance training are likely to reduce an individual's risk of type 2 diabetes.

More information: 'Handgrip strength improves prediction of type 2 diabetes: A prospective cohort study' by Setor K. Kunutsor, Ari Voutilainen, Jari A. Laukkanen in *Annals of Medicine*.

Provided by University of Bristol