People with blood groups A, B and AB at higher risk of type 2 diabetes than group O

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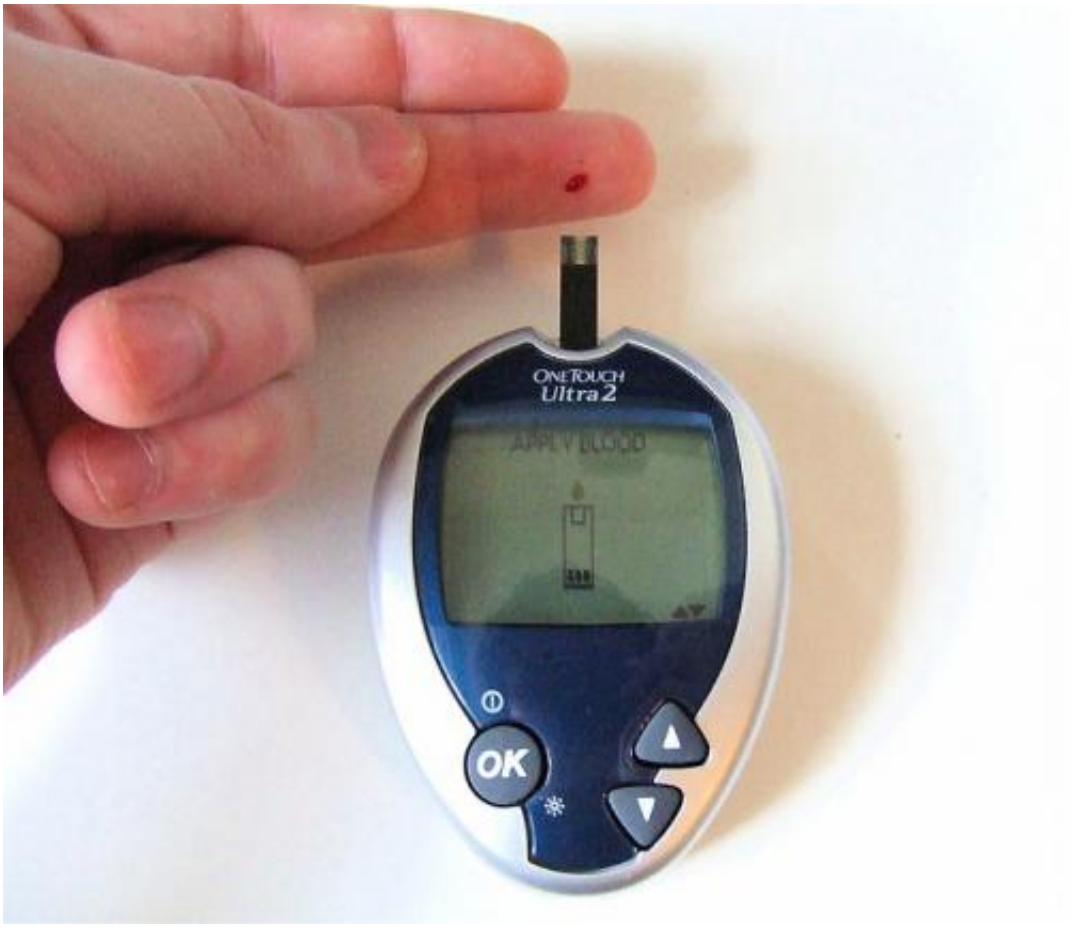

Blood glucose monitoring. Credit: Wikipedia

A study of more than 80,000 women has uncovered different risks of developing type 2 diabetes associated with different blood groups, with

the biggest difference a 35% increased risk of type 2 diabetes found in those with group B, Rhesus factor positive (R+) blood compared with the universal donor group O, Rhesus factor negative (R-). The study is published in *Diabetologia* (the journal of The European Association for the Study of Diabetes) and is by Dr Guy Fagherazzi, and Dr Françoise Clavel-Chapelon, Center for Research in Epidemiology and Population Health, INSERM, Villejuif, France, and colleagues.

While previous studies have investigated the links between blood group and stroke (finding an increased risk for group AB versus group O), those on blood groups and their link with diabetes have been small and thus underpowered and unable to provide definitive results. In this new research, Fagherazzi and colleagues took data from 82,104 women from the large prospective E3N cohort in France* followed between 1990 and 2008. The objective of this study was to evaluate the relationship of ABO blood type (A, B, AB and O), Rhesus factor (positive or negative) and a combination of the two (ABO×Rhesus) with type 2 diabetes (T2D).

The results showed that, compared with women with group O blood, women with group A were 10% more likely to develop T2D, and those with group B 21% more likely (both statistically significant). The AB group was 17% more likely to develop T2D, but this result was not statistically significant. When looking solely at R+ versus R- women, neither group was at increased risk of developing T2D compared with the other.

The authors then combined ABO group and Rhesus group and compared each possible combination with O negative (O-), which is known as the universal donor group because since it contains none of the A. B, or Rhesus antigens, blood from people in this group can be successfully donated to any other group (without rejection).

Compared with O- women, the highest increased risk of developing T2D was found in B+ (35% increased risk), followed by AB+ (26%), A- (22%), A+ (17%). The results for O-, B-, and AB- groups were not statistically significant.

Dr Fagherazzi says: "The present study shows for the first time in a large prospective cohort that specific ABO blood groups are associated with an increased type 2 diabetes risk." The authors say that the reasons behind the association are currently unknown, but could be related to a number of factors: it has been suggested that the human ABO locus might influence endothelial or inflammation markers. ABO grouping is also associated with various molecules known to be connected to T2D, and a recent paper concluded that ABO grouping is a factor which determines the overall gut microbe composition, which in turn affects metabolism and thus could be related to T2D.

Dr Clavel-Chapelon notes: "Our study population included only women but, to our knowledge, no biological mechanisms are likely to explain a sex-dependent association. Information on the participants was self-reported but this is unlikely to substantially affect the results. This is the first study to investigate a relationship between blood type and type 2 diabetes risk using such a large cohort size and a prospective design."

Dr Fagherazzi concludes: "Our findings support a strong relationship between blood group and diabetes risk, with participants with the O blood type having a lower risk of developing type 2 diabetes. Therefore, the effects of blood groups should be investigated in future clinical and epidemiological studies on diabetes. Further pathophysiological research is also needed to determine why the individuals with blood type O have a lower risk of type 2 diabetes."

Provided by Diabetologia