Anti-diabetic treatment associated with reduced risk of developing blood cancer

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Metformin 500mg tablets. Credit: public domain

People who use metformin are less likely to develop a myeloproliferative neoplasm (MPN) over time, indicating that the treatment may help prevent the development of certain types of cancers, according to a study published in Blood Advances.

Metformin is a therapy used to treat high blood sugar in people with type 2 diabetes that increases the effect of insulin, reduces how much glucose is released from the liver and helps the body absorb glucose. A meta-analysis of previous studies connected the therapy with a reduction in the risk of gastrointestinal, breast, and urologic cancers, while a retrospective study of U.S. veterans found that metformin users have a reduced risk for solid and hematological cancers.

"Our team was interested in understanding what other effects we see with commonly prescribed treatments like metformin," said Anne Stidsholt Roug, MD, Ph.D., chief physician at Aarhus University Hospital and clinical associate professor at Aalborg University Hospital in Denmark.

"The anti-inflammatory effect of metformin interested us, as MPNs are very inflammatory diseases. This is the first study to investigate the association between metformin use and risk of MPN."

MPNs are a group of diseases that affect how bone marrow produces blood cells, resulting in an overproduction of red blood cells, white blood cells, or platelets that can lead to bleeding problems, a greater risk of

stroke or heart attack, and organ damage.

The researchers compared metformin use among patients diagnosed with MPNs and a matched population from the Danish general population between 2010 and 2018.

Of the 3,816 MPN cases identified from the sample, a total of 268 (7.0%) individuals with MPN had taken metformin as compared to 8.2% (1,573 out of 19,080) of the control group of people who had taken metformin but were not diagnosed with MPN. Just 1.1% of MPN cases had taken metformin for more than five years, as compared to 2.0% of controls. The protective effect of metformin was seen in all subtypes of MPN when adjusting for potential confounders.

"We were surprised by the magnitude of the association we saw in the data," said Daniel Tuyet Kirstensen, MD, Ph.D. student, at Aalborg University Hospital and lead author of the study.

"We saw the strongest effect in people who had taken metformin for more than five years as compared to those who had taken the treatment for less than a year," Dr. Kristensen added that this makes clinical sense, as MPNs are diseases that develop over a long period of time, like other types of cancer.

The researchers noted that while the protective effect of long-term metformin use was seen in all subtypes of MPN, the study was limited by its registry-based retrospective design. Further, they could not account for lifestyle factors that can affect cancer risk, such as smoking, obesity, and dietary habits.

Dr. Roug noted that while the study team were unable to assess exactly why metformin seems to protect against the development of MPN, they hope additional research will be conducted to better understand why this

may be. Moving forward, the researchers aim to identify any similar trends with myelodysplastic syndromes and acute myeloid leukemia in population-level data for future study.

More information: Metformin use and risk of myeloproliferative neoplasms - a Danish population-based case-control study, *Blood Advances* (2024). doi.org/10.1182/bloodadvances.2023012266

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