

In mice, diabetes drug metformin tied to longer, healthier lives

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Study corroborates other research showing the drug may have benefits beyond diabetes care.

(HealthDay)—A new study in mice hints that the widely used diabetes drug metformin might have life-extending benefits beyond its effects on diabetes.

The study found that a small dose of [metformin](#), given regularly in middle age, boosted the health of mice and extended their lives, while a larger dose shortened their lives.

"Aging is a [driving force](#) behind metabolic syndrome and [diabetes](#). Given that metformin is clinically proven to alleviate symptoms of these conditions, and reduce risk of cancer, we thought perhaps it was a good candidate to study for its broader effects on health and [lifespan](#)," study leader Rafael de Cabo, of the U.S. National Institute on Aging (NIA), explained in a U.S. National Institutes of Health news release.

The drug was given to the mice beginning in [middle age](#) and two doses of metformin—0.1 percent and 1 percent—were tested by the international team of scientists. The mice that received the 0.1 percent dose lived nearly 6 percent longer than mice in a group that received no metformin, the researchers said.

But the mice that received the larger dose of metformin had their lifespans shortened by an average of more than 14 percent compared to mice not on the drug, likely due to [kidney failure](#).

On the other hand, the lower dose of metformin did not appear to have any effect on the kidneys, according to the study published in the July 30 issue of the journal *Nature Communications*.

According to the study, metformin appears to boost the use of fat for energy in mice and it also helped them maintain body weight as they aged, a characteristic that other studies have found is associated with longer survival.

The mice that received metformin also had lower rates of [cataracts](#), a common health problem in the strain of mice used in the study. Metformin also prevented the onset of metabolic syndrome—a group of symptoms that increase the risk for type 2 diabetes and [heart disease](#)—and appeared to have some antioxidant effects in the rodents.

Metformin, which has been used for decades to treat [type 2 diabetes](#), improves insulin sensitivity, spurs sugar to be converted to energy and prevents sugar buildup in the liver. It also reduces risk of health issues associated with [metabolic syndrome](#).

One expert said the study does seem promising.

"This study is highly credible and suggests that metformin may be useful

to treat a range of age-related diseases, possibly including cancer in humans," said Charles Mobbs, a professor of neuroscience, endocrinology and geriatrics at the Icahn School of Medicine at Mount Sinai in New York City.

"It should be noted that mice do not develop diabetes with age (their blood glucose actually tends to fall with age) so the protective effects of metformin to increase lifespan is probably not due to its anti-diabetic effects, per se," he added.

According to the study's authors, the new findings suggest that metformin may mimic some of the health benefits of calorie restriction—limiting the amount of calories taken in each day from food— that have been seen in some studies with animals.

While the findings of the new study are promising, scientists note that research involving animals often fails to produce similar results in humans.

"The mechanism of action of metformin, by increasing insulin sensitivity and reducing inflammation, corroborate its health-improving effects," said Dr. Spyros Mezitis, an endocrinologist at Lenox Hill Hospital in New York City.

However, Mezitis, who was not involved in the new research, cautioned that "studies in humans should confirm the health improvement data in [mice](#)."

Still, Mobbs remained optimistic.

"Metformin is widely prescribed to diabetic patients, and produces among the lowest mortality rate in these patients compared to other drugs used to treat diabetes," Mobbs said. "Several studies have

demonstrated the drug extends lifespan and reduces tumor burden in other animal models, so the present results are highly credible."

He added that "obviously, metformin should only be used under the care of a physician. At present the drug is only approved for use to treat diabetes, though this may change."

More information: The American Academy of Family Physicians outlines [good health habits at age 60 and beyond](#).

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