

# Taking blood pressure drugs at bedtime lowers diabetes risk

September 23 2015

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New research published in *Diabetologia* (the journal of the European Association for the Study of Diabetes) shows that taking blood pressure medications at bedtime, rather than in the morning, reduces blood pressure (BP) whilst asleep and also halves the risk of developing type 2 diabetes. The research, published in two separate papers, is by Dr Ramón Hermida and colleagues from the University of Vigo, Spain.

In the first paper, the authors detail their work proving the concept that reducing BP during hours of sleep represents a target for intervention to prevent new cases of diabetes. In the second paper, they investigated whether therapy with the entire daily dose of one or more hypertension ([high blood pressure](#)) medications at [bedtime](#) exerts greater reduction in the risk of new-onset diabetes than therapy with all medications upon awakening.

The authors did a prospective, randomised, open-label, blinded endpoint trial of 2,012 hypertensive [patients](#) without diabetes, 976 men and 1,036 women, mean age 53 years. Patients were randomised to ingest all their prescribed hypertension medications upon awakening or the entire daily dose of one or more of them at bedtime. Investigators who did not know which patients were in which group assessed the development of new-onset diabetes.

During a median follow-up of 6 years, 171 participants developed type 2 diabetes. Patients in the bedtime-, compared with the morning-treatment group, showed a significantly lower asleep mean BP and a greater sleep-

time relative BP decline. In the bedtime treated group, there was a lower-prevalence of a phenomenon known as 'non-dipping' - in which patients' night time BP falls by less than 10% compared to daytime BP. Non-dipping occurred in 32% of bedtime-treated patients and 52% of those getting their treatment in the morning.

There was also a 57% decrease in the risk of developing new-onset type 2 diabetes in the bedtime-treated group after adjustment for the potential confounders of fasting glucose, waist circumference, mean asleep systolic BP, dipping classification and chronic kidney disease.

Further analysis showed that greater reduction in risk of developing diabetes was observed for bedtime compared with awakening treatment with angiotensin receptor blockers (ARBs) (61%), ACE inhibitors (69%) and beta blockers (65%). These medications modulate or block the effects of angiotensin II, a hormone that causes not only vasoconstriction and increased of blood pressure, but also contributes to increased glucose release from the liver and decreased insulin sensitivity.

The authors conclude that the before bed regimen of taking anti-hypertensive medications is as safe as taking them in the morning, and say: "In hypertensive patients without diabetes, ingestion of the entire daily dose of one or more blood pressure-lowering medications at bedtime compared with ingestion of all such medications upon awakening results in significantly improved sleeping [blood pressure](#) control and prevention of new-onset [diabetes](#)."

**More information:** *Diabetologia*, [link.springer.com/article/10.1007/s00125-015-3748-8](http://link.springer.com/article/10.1007/s00125-015-3748-8)

*Diabetologia*, [link.springer.com/article/10.1007/s00125-015-3749-7](http://link.springer.com/article/10.1007/s00125-015-3749-7)

Provided by Diabetologia

Citation: Taking blood pressure drugs at bedtime lowers diabetes risk (2015, September 23)  
retrieved 27 April 2024 from

<https://medicalxpress.com/news/2015-09-blood-pressure-drugs-bedtime-lowers.html>

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