

Study explains why fainting can result from blood pressure drug used in conjunction with other disorders

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A new study led by a Canadian research team has identified the reason why prazosin, a drug commonly used to reduce high blood pressure, may cause lightheadedness and possible fainting upon standing in patients with normal blood pressure who take the drug for other reasons, such as the treatment of PTSD and anxiety.

According to University of British Columbia researcher and study team leader Dr. Nia Lewis, the body is in constant motion leading to changes in [blood pressure](#) with every activity. For example, when standing, the body copes with the sudden drop in blood pressure by constricting peripheral vessels to concentrate the blood in the areas that help stabilize the body.

This study found that prazosin prevents this process by blocking the α_1 -adrenoreceptor, a critical pathway that allows the vessels to constrict. This [physiological response](#) is dangerous for individuals with [normal blood pressure](#) who take prazosin to treat the symptoms of PTSD and anxiety, for the act of standing up can cause lightheadedness and/or fainting.

The study, entitled "Initial orthostatic hypotension and [cerebral blood flow](#) regulation: effect of α_1 -adrenoreceptor activity," (bit.ly/104sWJE) is published in the [American Journal of Physiology –Regulatory, Integrative and Comparative Physiology](#).

Methodology

Eight males and four females, with an average age of 25, and all of whom had normal blood pressure, were enrolled in the cross-over trial. On day one of the study, participants were weighed, measured, and familiarized with the [blood pressure monitoring](#) equipment and procedures that would be used.

On the next visit, participants stayed overnight at the research facility in order to control for activity and diet. The following morning they were given either prazosin (1mg/20kg body weight) or a placebo, and instructed to lie down. After 20 minutes, they were told to rise in one smooth motion from the lying-down position to standing, and their blood pressure and cerebral blood flow was continuously monitored. They were required to remain standing for three minutes or until they felt severe lightheadedness and dizziness, or felt as if they were about to faint.

On their third and final visit the participants underwent the same procedure as on the second visit. At this visit, however, they received the placebo if they had previously been given the medication, and vice versa.

Results

The investigators found that:

- All but one of the 12 participants who took the medication experienced temporary dizziness or lightheadedness upon standing.
- All participants who took the placebo were able to complete the three-minute standing test. By contrast, only 2 of the 12 were able to complete the standing test after taking prazosin.
- After taking prazosin, none of the participants were able to attain normal blood pressure levels after standing. As a result, blood flow to the brain was reduced and subjects were unable to stand for 3 minutes as they began to experience the onset of fainting.
- When the participants had taken prazosin,

mean arterial blood pressure and systolic blood pressure was significantly lower—by 15 percent— when lying down compared to when they took the placebo. Mean arterial blood pressure also fell for a longer period (11 seconds versus eight for placebo) after participants stood up following consumption of the medication, resulting in a lower arterial pressure levels.

- Blood flow to the brain, as measured by cerebral blood flow velocity, was not different when lying down. However, brain blood flow in the prazosin trial was reduced by 33 percent more than in than compared with the placebo trial.

Conclusions

"We were able to determine that, because prazosin shuts down a pathway that is critical to regulate blood pressure, the capacity to safely control blood flow to the brain was also reduced to a level that could induce fainting," said Dr. Lewis. "No study has examined the effects of prazosin on the interaction between blood pressure and blood flow to the brain. The findings derived from this study show a mechanism of how prazosin causes fainting," she explained.

Importance of the findings

"This study highlights the importance of a key pathway in the body's blood pressure system, known as the α 1-adrenergic sympathetic pathway, in ensuring the recovery of blood pressure following standing and how important this pathway is in ensuring [blood flow](#) to the brain is not reduced to a level where fainting may occur," said Dr. Lewis.

Additionally, this study provides a cautionary alert to those who are prescribed prazosin, for other conditions besides hypertension.

Provided by American Physiological Society

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