That 'four hour erection': new discovery may help prevent a complication of priapism

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For men coping with painful erections lasting for long periods of time, or priapism, new research published online in *The FASEB Journal* offers hope. That's because researchers from the United States and China show that the enzyme adenosine deaminase may prevent priapism from progressing to penile fibrosis, a condition associated with the build up of scar tissue and eventual impotence. As penile fibrosis is a complication of priapism, so priapism is a complication of sickle cell disease. Adenosine deaminase, which breaks down adenosine, is already used in humans as a treatment for a rare immune disorder.

"Coping with priapism is hard enough, but knowing that it can ultimately lead to fibrosis within the penis adds insult to injury," said Gerald Weissmann, M.D., Editor-in-Chief of *The* FASEB Journal. "Hopefully this discovery can yield new drugs that relieve the excitatory signals sent by adenosine so that these men to get some relief."

For the study, the researchers used two priapism animal models to determine the role of increased adenosine in penile fibrosis, a dangerous problem believed to be caused by priapism. One model was that of adenosine deaminase-deficient mice and the other was sickle cell disease transgenic mice. Both of these sets of mutant mice were treated with the enzyme adenosine deaminase enzymes to lower adenosine levels. After 8 weeks, they found that this enzyme significantly lowered adenosine levels in the penises of both groups of test mice. Reduction of adenosine by these enzymes successfully prevented and corrected penile fibrosis in both sets of mice.

"Because of our study, we have revealed that increased adenosine signaling contributes to the pathogenesis of the progression of priapism to penile fibrosis," said Yang Xia, a scientist involved in the study from the University of Texas-Houston Medical School's Department of Biochemistry and Molecular Biology. "This finding led to a novel therapeutic possibility to treat and prevent this dangerous complication seen in priapic humans by targeting on this signaling pathway in the near future."

More information: Jiaming Wen, Xianzhen Jiang, Yingbo Dai, Yujin Zhang, Yuxin Tang, Hong Sun, Tiejuan Mi, Prasad V. Phatarpekar, Rodney E. Kellems, Michael R. Blackburn, and Yang Xia. Increased adenosine contributes to penile fibrosis, a dangerous feature of priapism, via A2B adenosine receptor signaling. *FASEB J.* doi:10.1096/fj.09-14414

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