Medical Xpress

Wee small hours of the morning explained at last

May 1 2012

Scientists have pinpointed a protein that helps explain why the elderly frequently have to get up in the night to urinate, a problem that can badly interfere with sleep.

Deficient levels of protein called connexin43 trick the bladder into believing that it is full, which sends a "must urinate" warning to the brain, they report on Tuesday in the journal Nature Communications.

Connexin43 is part of a cascade of proteins in the so-called circadian clock -- the complex mechanism by which body processes crank up during daylight and slow down at night.

During sound sleep, a healthy person produces a smaller volume of urine from the kidneys than during daytime. At the same time, more urine is stored during sleep than during the active, daylight phase.

But when there are lower levels of connexin43, the smooth muscles of the bladder become oversensitised to nerve signals that give a feeling of fullness, the study says.

Researchers led by Osamu Ogawa of Kyoto University made the discovery among lab mice that had been genetically modified to lack the gene that makes connexin43.

The team developed an automated system, using a roll of filter paper that turned purple when exposed to even tiny amounts of fluid, to count how

often the caged rodents urinated at night.

The chronic need to urinate at night, a condition called nocturnal enuresis, also causes bedwetting by young children.

The researchers say there are likely to be other circadian pathways that are involved in the problem.

They include impairment of the cortex -- part of the brain which is aroused by signals from the bladder -- or over-production of urine by the kidneys at night.

Citation: Wee small hours of the morning explained at last (2012, May 1) retrieved 1 May 2024 from https://medicalxpress.com/news/2012-05-wee-small-hours-morning.html