Medical Xpress

While you were sleeping: Sleep apnea's effect on the brain may be more severe than previously thought

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It has been linked to learning impairment, stroke and premature death. Now research from the University of New South Wales (UNSW) has found that snoring associated with sleep apnoea may impair brain function more than previously thought.

Sufferers of obstructive sleep apnoea experience similar changes in brain biochemistry as people who have had a severe stroke or who are dying, the research shows.

A study by UNSW Brain Sciences, published this month in the *Journal of* Cerebral Blood Flow *and Metabolism*, is the first to analyse - in a second-by-second timeframe - what is happening in the brains of sufferers as they sleep. Previous studies have focused on recreating oxygen impairment in awake patients.

"It used to be thought that apnoeic snoring had absolutely no acute effects on brain function but this is plainly not true," said lead author of the study, New South Global Professor Caroline Rae.

Sleep apnoea affects as many as one in four middle-aged men, with around three percent going on to experience a severe form of the condition characterised by extended pauses in breathing, repetitive asphyxia and sleep fragmentation.

Children with enlarged tonsils and adenoids are also affected, raising concerns of long-term cognitive damage.

Professor Rae and collaborators from Sydney University's Woolcock Institute used magnetic resonance spectroscopy to study the brains of 13 men with severe, untreated, obstructive sleep apnoea. They found that even a moderate degree of oxygen desaturation during the patients' sleep had significant effects on the brain's bioenergetic status.

"The findings show that lack of oxygen while asleep may be far more detrimental than when awake, possibly because the normal compensatory mechanisms don't work as well when you are asleep," Professor Rae, who is based at the Prince of Wales Medical Research Institute, said.

"A lack of oxygen in the brain during even small time increments of obstructive sleep apnoea caused levels of the high-energy currency adenosine triphosphates (ATP) to fall
and levels of inorganic phosphate to rise, without the usual changes in phosphocreatine or brain pH - the mechanisms that normally would protect the brain against oxygene depletion," Professor Rae explained.

"This is happening in someone with sleep apnoea acutely and continually when they are asleep. It's a completely different biochemical mechanism from anything we've seen before and is similar to what you see in somebody who has had a very severe stroke or is dying."

The findings suggested societal perceptions of snoring needed to change, Professor Rae said.

"People look at people snoring and think it's funny. That has to stop."

Professor Rae said it was still unclear why the body responded to oxygen depletion in this way. It could be a form of ischemic preconditioning at

work, much like in heart attack sufferers whose initial attack makes them more protected from subsequent attacks.

"The brain could be basically resetting its bioenergetics to make itself more resistant to lack of oxygen," Professor Rae said. "It may be a compensatory mechanism to keep you alive, we just don't know, but even if it is it's not likely to be doing you much good."

Source: University of New South Wales (news : web)

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