High sugar and fat diet 'may increase cell damage during sleep'

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Continuing sleepless nights can increase the risk of heart disease, stroke and even death for sufferers of Obstructive Sleep Apnoea (OSA) who regularly stop breathing during the night for brief periods of time.

A new research study by scientists at the University of Birmingham is seeking to establish the effects of a high sugar and fat intake on OSA and its consequences. The researchers will test the theory that high blood sugar and fat levels increase the cell damage that the low oxygen conditions of sleep apnoea can cause.

Researcher Harry Griffin, a student from the **School of Sport and Exercise Sciences (/schools/sport-exercise/index.aspx)** , explained:

"Obstructive sleep apnoea is a condition in which the airway closes for brief periods following heavy snoring. This causes a drop in blood oxygen levels, which is associated with the accumulation of toxic substances called reactive oxygen species. Despite antioxidants acting as a defense against these toxic substances, damage to cellular structures, in a process called oxidative stress, can still occur. This may, over many years, cause cardiovascular disease."

Many obstructive sleep apnoea patients also suffer from obesity and Type-2 diabetes, characterised by high blood sugar and fat levels, which may make them more at risk of the long term damage of sleepless nights. The research study will investigate whether consumption of a meal high in sugar and fat can alter how the body copes under low oxygen conditions and is calling for volunteers to take part.

Mr Griffin added:

"Type-2 diabetes is now a common health disorder with an expected prevalence worldwide of 366 million by 2030 and recent research has shown that fifty per cent of these patients may also suffer from OSA.

"We aim to investigate whether high blood glucose and fat levels, as often occurs in these patients, could increase oxidative stress during the low oxygen conditions seen in obstructive sleep apnoea. If this theory is correct, we hope that our results will increase awareness of the risk to health due to the combinations of these conditions and possibly initiate the development of future treatments."

The researchers are looking to recruit male participants aged between 40 and 65 to take part in three laboratory visits to the University. During each visit, which will last no more than eight hours and can be carried out on weekdays and/or weekends, volunteers will be given a high calorie meal and then will watch television for six hours, during which blood samples will be taken at regular intervals.

Whilst relaxing watching television, participants will breathe lower than normal oxygen levels through a comfortable facemask, reducing the amount of oxygen in the blood. Breathing at this low oxygen level is not uncomfortable and is often unnoticeable to participants. Analysis of blood samples will enable assessment of oxidative stress on the body during this process to establish the correlation between high sugar and fat intake and blood oxygen levels.

Volunteers will receive £150 for taking part in the study. If you are interested in participating, or for more information, please contact Harry Griffin 0121 414 8740 or **hsg564@bham.ac.uk (mailto:hsg564@bham.ac.uk)** or Dr George Balanos via 0121 415 8828 or **g.m.balanos@bham.ac.uk (mailto:g.m.balanos@bham.ac.uk)** .

• Researchers are looking to recruit approximately 20 male participants aged between 40 and 65 to take part in this study. Participants should be overweight (BMI greater than 25) and healthy

Exclusion criteria for participants:

• Participants must not apply if they have a known metabolic, cardiovascular, respiratory and neurological disease

• Participants must not apply if they currently smoke

• Participants must not have obstructive sleep apnoea or diabetes

For media enquiries, please contact Amy Cory, University of Birmingham Press Office via 0121 414 6029 or **a.cory@bham.ac.uk (mailto:a.cory@bham.ac.uk)** .