

## Obstructive sleep apnea as risk factor for atherosclerosis

Professor Mary IP

Department of Medicine, The University of Hong Kong, Hong Kong



Professor Mary IP

Obstructive sleep apnea (OSA) occurs primarily in the upper airways, but it triggers a myriad of downstream systemic events, and its major morbidity fall on the cardiovascular system and neurobehavioural function.

OSA is highly associated with obesity and other phenotypic features known to be risk factors for atherosclerosis and cardiovascular disease. Atherosclerosis is the underlying pathology of many cardiovascular diseases, including hypertension, coronary artery disease and related cardiac dysfunction, cerebrovascular diseases. Many epidemiologic and clinical studies support that OSA contributes to cardiovascular morbidity and mortality, independent of confounding factors, though prospective well controlled long term interventional follow up studies are lacking. In the face of heavy confounding effects from obesity and visceral obesity, many studies have shown evidence for an independent association between OSA and these atherosclerotic CVD, and that treatment of OSA may improve the CVD. Studies have also consistently shown that OSA leads to endothelial dysfunction, which is a known precedent of atherosclerotic vascular diseases.

Current concepts of atherosclerosis indicate that it is an inflammatory process of the vessel wall, starting at the endothelial surface, with participation of various cells and molecules. Clinical and translational studies of OSA have reported that OSA may trigger a cascade of biochemical or metabolic aberrations with an adverse atherogenic profile.

Recently, there is increasing literature on laboratory animal/cell work using intermittent hypoxia to simulate OSA. Intermittent hypoxia in mice is shown to upregulate liver synthesis of some atherogenic lipids, and to result in atherosclerotic lesions in the aorta.

In our enthusiasm for the role of OSA in vasculopathy, one must acknowledge the many weaknesses and gaps in our current evidence. OSA is a chronic condition, and it is likely that the body has innate measures of homeostasis, and there are many external influences such as lifestyle habit. When and how the balance is overwhelmed in favour of vasculopathy will determine the ultimate clinical outcome of OSA.