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Gender difference in protein expression of vascular wall in mice exposed to chronic intermittent hypoxia: a preliminary study

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ABSTRACT. Obstructive sleep apnea (OSA) is an independent risk factor for cardiovascular diseases such as systemic arterial hypertension, ischemic heart disease, stroke, heart failure, atrial fibrillation, and cardiac sudden death. The pathogenesis of cardiovascular disease in OSA is thought to be induced primarily by chronic intermittent hypoxia (CIH), a specific pattern of change in oxygenation during sleep. However, the underlying mechanisms of CIH-induced vasculature injury and gender differences are not well documented. The iTRAQ Quantitative Proteomic method enables analysis of a number of different proteins among several groups. Thus, we explored gender differences in protein expression in

the vascular walls of mice exposed to CIH. C57BL/6J mice of each gender were exposed to CIH with a fractional inspired O_2 (FiO_2) nadir of 5% or control, with a treatment time of 8 h/day for 28 days. Differential proteins related to CIH-induced vascular injury between genders were identified using iTRAQ proteomic technology. A total of 163 proteins were identified, of which 34 showed significant differences between genders, which may correlate with vascular injury by CIH. Twenty up-regulated proteins and 14 downregulated proteins were observed in female mice compared with male mice. We identified different vascular proteins expressed under CIH between genders, suggesting that these proteins may be biomarkers of vascular injury by CIH.

Key words: Obstructive sleep apnea; Gender difference; Vascular injury; Isobaric tag for relative and absolute quantitation; Proteomics; Chronic intermittent hypoxia