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Title: Brain oxidative stress induced by recurrent obstructive apneas: Old versus young rats

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Body: Background:Obstructive sleep apnea (OSA) is over 50% in elderly population and cognitive impairment is a well-known consequence. It has been reported that both oxygen partial pressure (PtO2) and oxidative stress increase during recurrent apneas in brain tissue of young rats(Almendros et al. Sleep, 2011;34:1127–1133). It has also been recently demonstrated a lower mean increase and a decrease in PtO2 swings amplitude during apneas in older rats (ATS,2013), but it is not known whether this pattern translates into brain oxidative stress. Aim: To measure the brain oxidative stress in response to obstructive apneas in young and old rats. Methods: This study was carried out on 40 male Wistar rats: 20 young (12-weeks old) and 20 old (18-months old). The rats were non-invasively subjected to recurrent obstructive apneas (50 apneas/h, 15 s each) over 4 hours. Brain tissue samples were excised for measurement of the content of lipid peroxidation (LPO), using an Assay Kit, and antioxidant enzyme levels were determined by Western Blot. Results: LPO significantly increased after apneas in young ($p<0.01$) but not in old rats. Superoxide dismutase, glutathione peroxidise-1, and gluthatione reductase increased after apneas, especially in the old rats ($p<0.05$).

Conclusion: The results show that, after recurrent apneas mimicking OSA, brain oxidative stress in older rats is lower than in young ones, probably due to increased levels of antioxidants.