

# Cerebrovascular risk in patients with obstructive sleep apnea syndrome before and after treatment with continuous positive airway pressure.

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## INTRODUCTION

Several studies have demonstrated a clear association between sleep apnea and increased risk of stroke<sup>1</sup> (Fig.a), but the pathophysiological mechanism is still unknown. The aim of our study was to investigate cerebral haemodynamic changes, carotid artery intima-media thickness (IMT) and prevalence of patent foramen ovale (PFO) in subjects with moderate-severe form of obstructive sleep apnea syndrome (OSAS) before and after continuous positive airway pressure (CPAP).

## METHODS

Nineteen consecutive male patients (mean age 57 y, DS 13) with diagnosis of moderate-severe OSAS (Apnea-Ipopnea index: 46,08 DS 19,44) were submitted to Echo color Doppler of extracranial arteries (TSA) to evaluate IMT. In all patients the presence of PFO was evaluated by Transcranial doppler sonography (TCD) with injection of contrast medium at rest and during Valsalva maneuver. Vascular reactivity was examined by calculating the Breath-Holding index (BHI)<sup>2</sup>: (Fig.b) one dual 2-MHz transducer fitted onto a headband and placed on the temporal bone window was used to obtain continuous measurement of middle cerebral artery mean flow velocity (MFV). BHI is obtained by dividing the percentage increase in MFV occurring during breath-holding by length of time (s) that subject hold their breath after a normal inspiration. During these registrations, also the blood systemic pressure and heart rate were recorded. Eleven male subjects matched for age were chosen as the control group: they performed the same tests of OSAS subjects, except to TCD for the research of PFO.

Ten of the nineteen patients period of three months with CPAP and they underwent to the same diagnostic tests of baseline. with OSAS completed a treatment.

## RESULTS

Statistical analysis of variables demonstrated there was a significant difference in BHI and IMT between OSAS and control group: BHI was lower in patients than in controls ( $p < 0,03$ ), whereas the mean value of IMT was higher compared to the healthy subject ( $p < 0,01$ ). Values of MFV were similar in patients (54,54 cm/sec; DS 9,18) and controls (50,59 cm/sec; DS 7,68). After only three months of CPAP therapy, a good, non-significant, increase was observed to BHI with respect to basal values. Instead, the changes in mean value carotid artery IMT between baseline and 3 months were significant ( $p < 0,01$ )<sup>3</sup>. PFO was present in 31% patients with OSAS.

## CONCLUSIONS

Patients with OSAS have a high risk of stroke independent of known risk factor; altered cerebral hemodynamics and the higher value of IMT can be considered a sign of increased risk factors for stroke.

## REFERENCES

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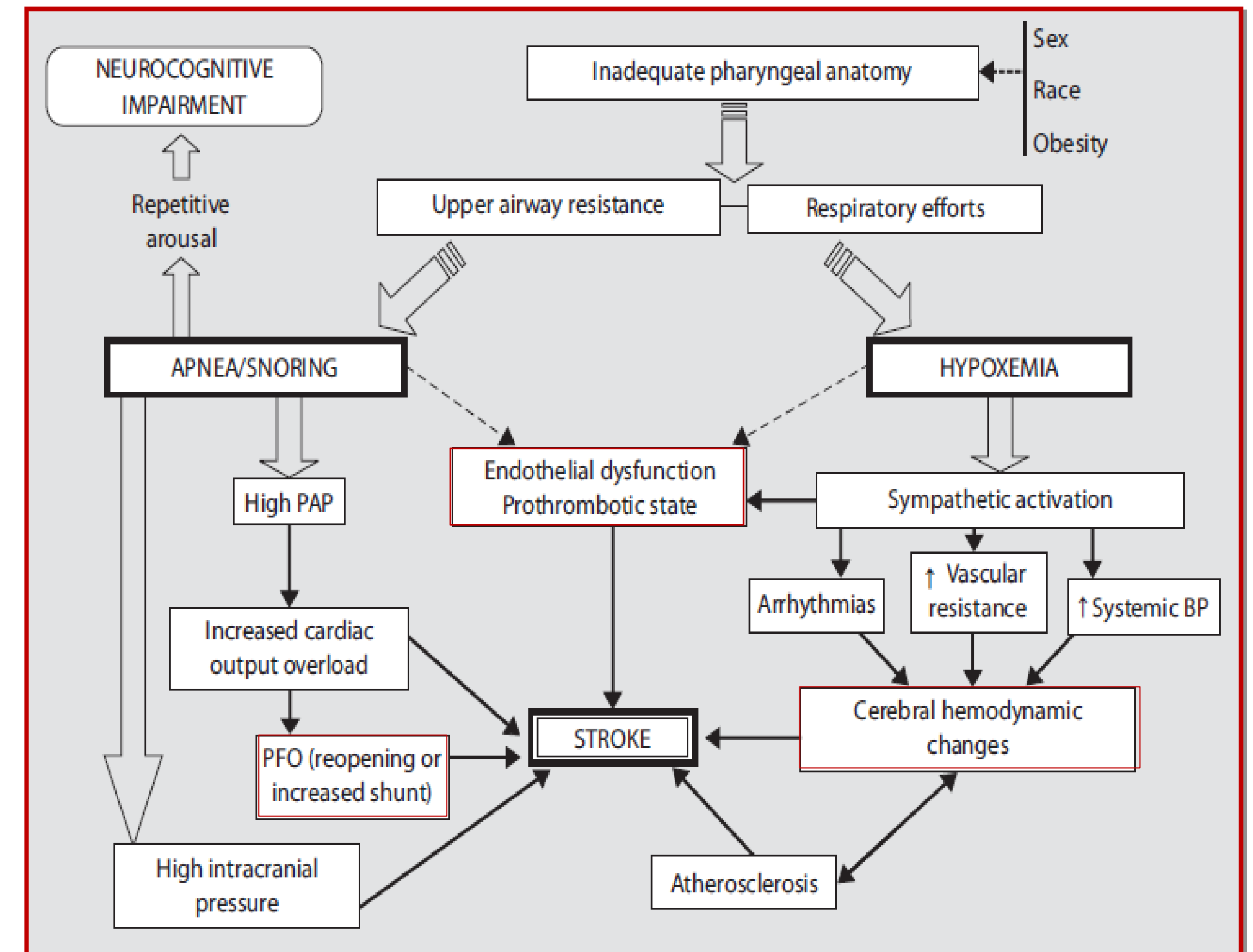


Fig. a

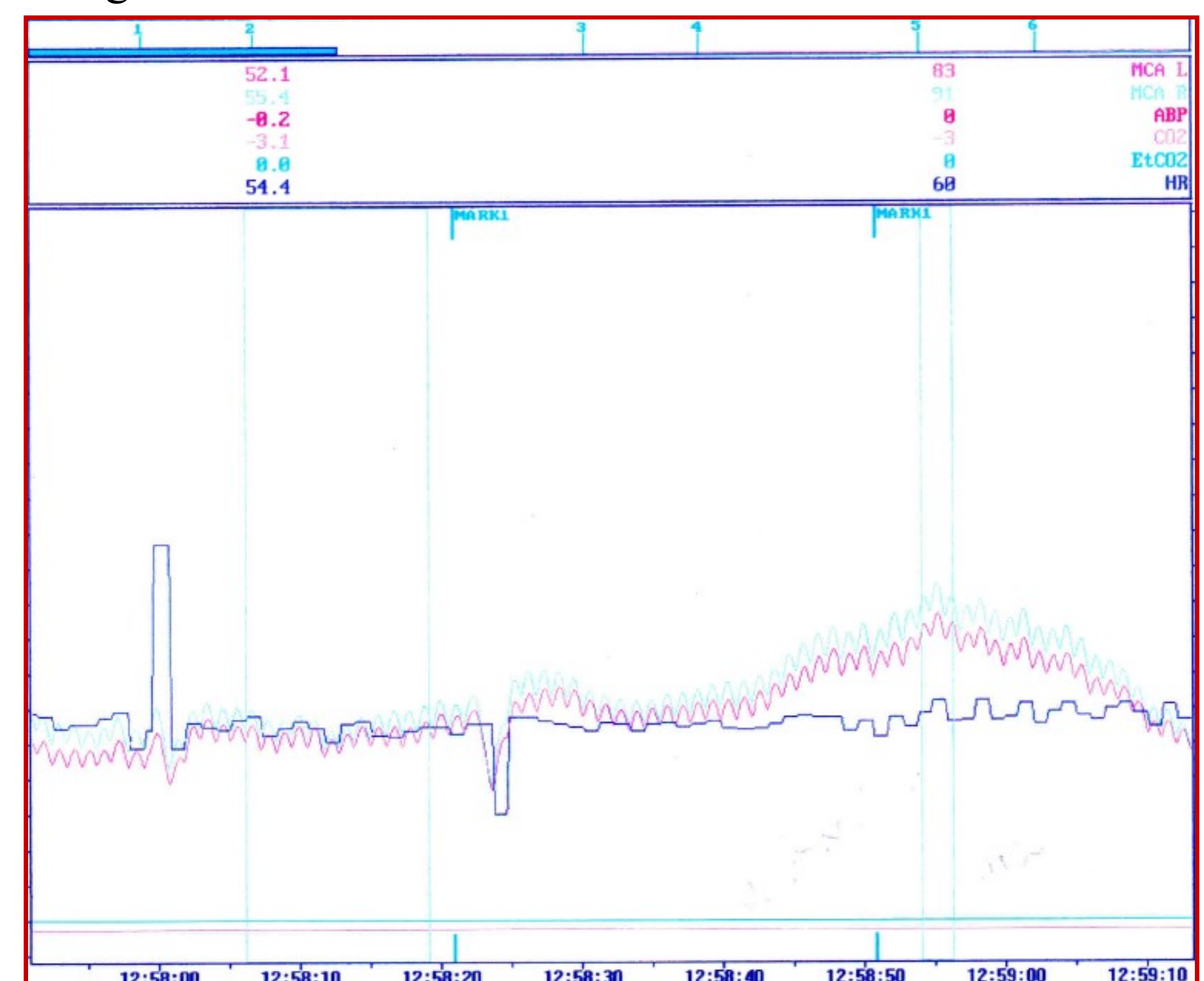


Fig. b