Dear Editor:

We commend Pang et al. for studying an important aspect of sleep surgery outcomes in their article “Upper Airway Surgery for Obstructive Sleep Apnea (OSA) Reduces Blood Pressure.”1 Over the last 2 years, our group has become increasingly interested in studying this topic. In 2017, we published a systematic review2 and received funding from the Triological Society for a 2-year research project titled Surgical Therapy for OSA on Blood Pressure and Peripheral Arterial Tonometry. For these reasons, we read this article with great interest.

In brief, Pang et al. prospectively studied 112 patients with hypertension undergoing nasal surgery, palate surgery, or tongue base radiofrequency for treatment of OSA. At mean follow-up of 16 months, the mean adjusted systolic blood pressure (BP) and diastolic BP were reduced from 146 ± 15.3 mm Hg to 122 ± 12.5 mm Hg (P < .001) and 91 ± 10.2 mm Hg to 76 ± 7.8 mm Hg (P < .001), respectively.

The dramatic, consistent change in mean BP of 24 mm Hg (systolic) and 15 mm Hg (diastolic) following OSA soft tissue surgery is truly remarkable. In the discussion, the authors allude to several continuous positive airway pressure (CPAP) trials for hypertensive patients, with “super CPAP users” (> 5.8 hours per night) achieving reductions of less than 10 mm Hg in 24-hour BP measurements.3 A randomized control trial with combined aggressive weight loss (mean 7.0 kilograms) and CPAP demonstrated 24-hour systolic reduction of 14 mm Hg at 24 weeks.4 Maxillomandibular advancement surgery, consistently superior to soft tissue surgery for OSA treatment, has shown reductions of clinical BP in the range of 10 to 15 mm Hg.5 In a strikingly similar study, the effect of pharyngeal surgery on BP was performed via 24-hour ambulatory measurement.6 At 3 months, the authors showed an improvement of 6 mm and 4 mm Hg in systolic and diastolic BP, respectively. Similar to the Pang et al. article, subjects were hypertensive at baseline and experienced significant weight loss. Thus, we should have expected BP reductions of similar magnitude.

What are possible explanations for the extraordinary findings in this article? We believe that there are several potential causes, but two are both most likely and most impactful: 1) BP acquisition methodology and 2) dietary counseling. BP change appears not to be the primary goal of the study because the techniques used for measurement of BP are not described. BP intervention trials require measurements to be obtained either by 24-hour ambulatory monitors or in a quiet, temperature-controlled environment with the patient resting while multiple measurements of BP are performed by an automated device. Such studies should ideally be done at the same time of day in order to reduce the impact of circadian changes in BP. It also appears that several visits occurred postoperatively when BP readings were obtained, yet these results are not presented.

Whereas the title suggests that upper airway surgery alone reduces blood pressure, the authors describe an additional intervention in the methods: “all patients were given dietary advice regarding daily calorie counts and intake.”7 Although a mean reduction in weight of approximately 2 kg occurred, the authors note that the interaction of BMI and BP change was not significant in multivariate analysis. However, no documentation of lifestyle changes (e.g., change in salt intake, exercise time, sleep duration) is provided. Because lifestyle modification appears to be a cornerstone of this study, it is incorrect to suggest that these undocumented modifications were not responsible, at least in part, for the tremendous change in BP observed.

In summary, one-time in-office blood pressure stands at high-risk of measurement bias, and incorporation of “strict dietary control” is not standard of care following such surgery. Given the extreme findings of this study relative to the established body of BP literature in OSA treatment, these results should be replicated in a prospective sleep surgery study, without concurrent lifestyle modification, focused on 24-hour ambulatory blood pressure as its primary endpoint.

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