

LETTERS TO THE EDITOR

Author Response

Response to Voulgaris et al. Burden of nocturnal hypoxia and type of positive airway pressure therapy may influence markers of acute kidney injury in patients with obstructive sleep apnea. *J Clin Sleep Med*. 2019;15(11):1695.

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We thank Voulgaris et al for their interest in our study.¹ We agree the relationship between obstructive sleep apnea (OSA) and chronic kidney disease (CKD) has been more elucidated over the past years.²⁻⁴ We also agree that nocturnal hypoxia, such as intermittent hypoxia in OSA, may contribute to the kidney injury. Our recently published data also revealed that only a single night of intermittent hypoxia events can activate blood cells with further injury of endothelium.⁵ As requested by Voulgaris et al, we further analyzed our data with nocturnal hypoxia parameters, such as mean peripheral oxygen saturation (SpO₂), lowest SpO₂, and time with SpO₂ < 85% from polysomnography (PSG) with the acute kidney injury (AKI) marker obtained from our patients (**Figure 1**). The data revealed that not only ODI¹ but also mean SpO₂, lowest SpO₂, and time with SpO₂ < 85% have positive correlations with AKI markers (**Figure 1A**, **Figure 1B**, and **Figure 1C**, respectively). Those results have shown us that the degree of hypoxia itself has the same influence on AKI markers.

Another interesting issue raised by Voulgaris et al is the effect the type of positive airway pressure has on the outcome of OSA. Because of the long waiting list for PSG, we applied auto-adjusting continuous positive airway pressure (APAP) for all of our patients. Here, we cannot provide the comparison between these two devices in this study. However, in the meta-analysis, the apnea-hypopnea index, arousal index, compliance, and sleepiness of patients using APAP is similar or better to fixed pressure continuous positive airway pressure.⁶ Although the minimal O₂ saturation is lower on APAP, we wonder whether this effect is strong enough to change the outcome of OSA.

CITATION

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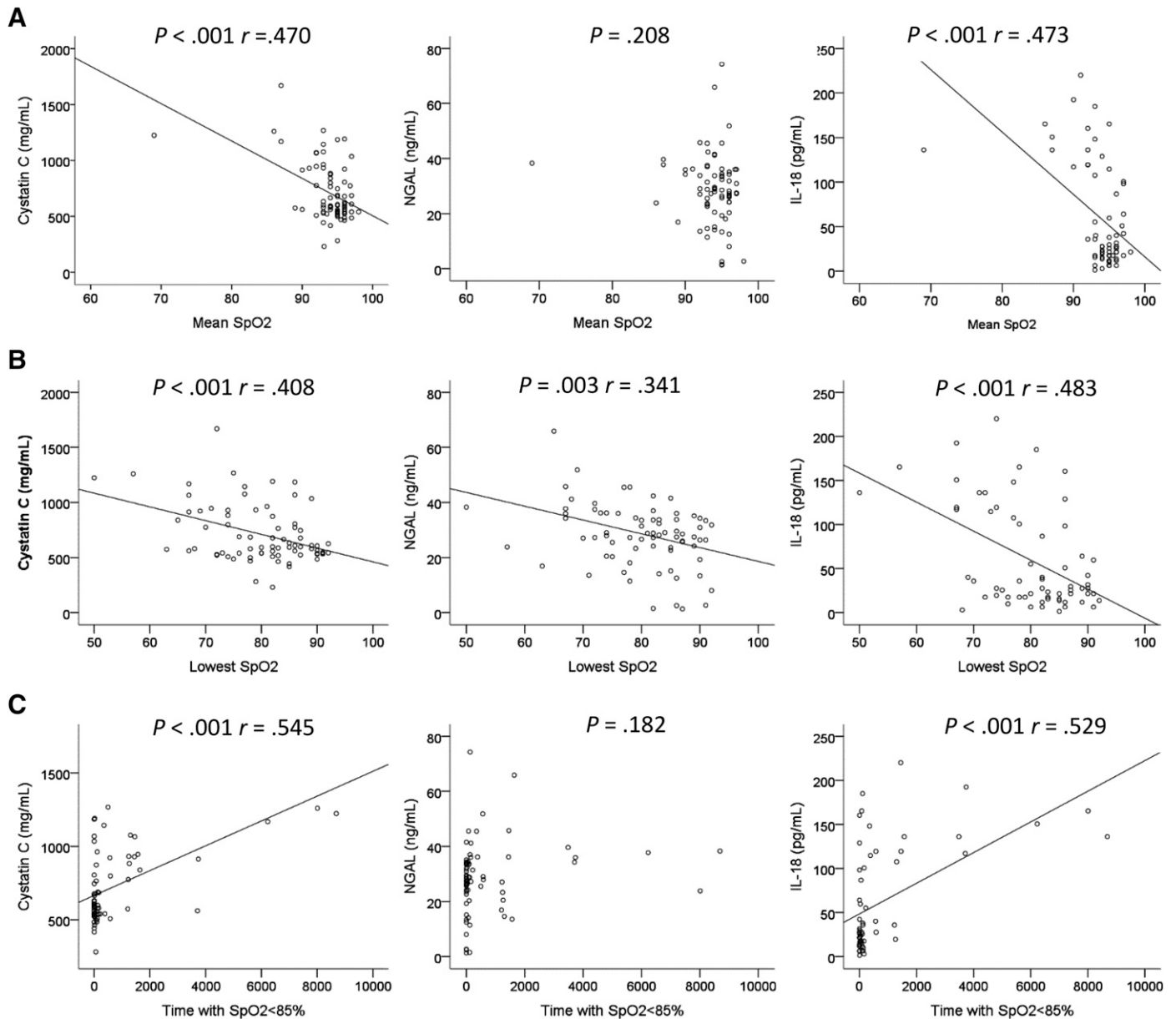
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DISCLOSURE STATEMENT

All authors have seen and approved the manuscript. The authors report no conflicts of interest.

Figure 1—Correlation between mean SpO₂, lowest SpO₂, time with SpO₂ < 85% and AKI markers.



AKI = acute kidney injury, IL-18 = interleukin-18, NGAL = neutrophil gelatinase-associated lipocalin.