LETTERS TO THE EDITOR

Salt Content in IV Fluids Given Intraoperatively May Influence Postoperative OSA Severity

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We read with great interest the study by Yadollahi et al., which showed that infusion of 22 mL/kg saline over 30 minutes during sleep in older men caused a highly significant 3-fold increase in the apnea-hypopnea index (AHI) along with an increase in the neck circumference during sleep that was 4-fold greater than during the control period.¹ We agree with the accompanying editorial that this study has important implications for postoperative patients with obstructive sleep apnea,² as AHI has been demonstrated to worsen in the postoperative period.^{3,4}

We would like to add another caveat. The salt content of fluids that are given in the intraoperative period, in addition to the positive fluid balance, might be a potential contributor to the worsening of AHI scores in the postoperative period. Kasai et al. showed that in patients with heart failure, there was a direct linear relationship between sodium intake and AHI scores.⁵ A cutoff of more than 2.4 g salt/day was associated with a diagnosis of sleep apnea.⁵ Additionally, Pimenta et al. demonstrated that dietary salt intake is related to the severity of OSA in patients with resistant hypertension and hyperaldosteronism.⁶ Finally, intensified therapy using spironolactone and metolazone resulted in a significant reduction in AHI, overnight leg fluid volume, neck circumference, as well as morning blood pressure in patients with resistant hypertension.⁷

When we examine the salt content of fluids given during the intraoperative period, a one liter bag of normal saline has 9 g of salt, which is the equivalent sodium content in thirty-five 1.5 oz single serving bags of Lay's Chips or 4 times the average daily sodium intake as recommended by the Institute of Medicine.⁸ Other intravenous fluids such as Ringers Lactate, Plasmalyte, and colloids like Voluven (hydroxyethyl starch 130/0.4) contain 6 g, 5.26 g, and 9 g of salt, respectively. Often, patients are given more than one liter of fluid for replacement and the resulting sodium load may be higher. This overwhelming sodium load on the body may contribute to fluid retention and subsequent rostral fluid shift from the legs to the neck while supine.⁵

Intraoperative fluid deficits may lead to suboptimal tissue perfusion and adequate fluid replacement is essential. On the other hand, an excess of salt and fluid may be deleterious in the at risk population such as patients with obstructive sleep

apnea. More research is needed to qualitatively assess the effects of fluid and salt administration on the severity of obstructive sleep apnea in the perioperative period. Perhaps it is not just the rostral fluid shift from the legs to the upper airway (determined by the rate and volume of fluid administration), but also the salt content that may determine the effects on AHI by influencing the redistribution of fluid away from the upper airway postoperatively. Therefore, the type of intravenous fluid could potentially impact the severity of OSA during the postoperative period.

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DISCLOSURE STATEMENT

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