High Risk for OSA: An Independent Risk Factor for Development of New-Onset Atrial Fibrillation After Cardiac Surgery

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PURPOSE: New-onset postoperative atrial fibrillation (POAF) is a highly prevalent complication after cardiac surgery with substantial effects on outcomes. Previous studies have reported that obstructive sleep apnea (OSA) is a risk factor for POAF after cardiac surgery. However, it is unknown whether the high risk for developing OSA but yet undiagnosed OSA also increases the risk of POAF.

METHODS: We retrospectively analyzed the association between high-risk undiagnosed OSA and the incidence of new-onset POAF in a total of 209 patients who underwent coronary artery bypass grafting surgery with or without concomitant valvular surgery in our university-affiliated community hospital from 2013-2015. After IRB approval, baseline demographics and perioperative characteristics were obtained and study cohort divided into low, high risk and diagnosed cases of OSA. High-risk for OSA defined by presence of 3 or more criteria out of age >65 years, hypertension, presence of snoring, body mass index $\geq 35$ kg/m$^2$ and Mallampatti score $\geq 3$. A primary study outcome was new onset POAF, with secondary outcomes were in-hospital mortality, postoperative length of stay (LOS) and cost of hospitalization. Statistical analysis was performed by SAS 9.4 software with chi-square and Wilcoxon rank sum tests. A multivariate logistic model was developed for predictors of new onset POAF.

RESULTS: Out of 209 patients, 39 (18.7%) were high risk, 139 (66.5%) were low risk and 31 (14.8%) were diagnosed cases of OSA. New onset POAF occurred in 96 (45.9%) patients. In the overall population, median age was 67, with 73.2%, 92.8%, and 44.5% were males, whites and obese, respectively. 84.7%, 69.9%, 41.2%, 16.3% and 16.3% had hypertension, coronary artery disease, diabetes, thyroid disorders, and previous history of cardiac surgery, respectively. New onset POAF developed in high vs diagnosed vs low risk for OSA (69.2% vs 41.9% vs 40.3%, p=0.0052). New onset POAF may increases in-hospital mortality (2.1% vs1.8%, p=NS), significantly increases postoperative LOS (8 vs 7 days, p=0.002) and cost ($217810 vs $197527, p=0.024) as compared to no POAF group. Multivariate analysis showed high-risk group had significantly increased risk for new onset POAF as compared to the low-risk group even after adjusting for age, sex, race, smoking status, comorbidities, perioperative variables and previous history and type of cardiac surgery (Odds ratio, 95% CI, 2.6 (1.03, 6.61), p=0.04).

CONCLUSIONS: This study demonstrates that high risk for OSA is an independent risk factor for the occurrence of new onset POAF in patients following cardiac surgery and increases the risk by two times as compared to the low risk for OSA. New onset POAF significantly increases postoperative LOS and hospitalization cost after cardiac surgery. Further studies should be performed to validate these findings.

CLINICAL IMPLICATIONS: Proper pre-operative screening work-up should be performed in suspected and high-risk cases of OSA and complications can be avoided if new onset POAF be anticipated in such patients and managed accordingly. For reduction of incidence of new onset POAF and its outcomes, high risk for yet undiagnosed OSA patients should be managed similarly as diagnosed OSA patients.

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