Hypoxia MAP

Dataset Introduction

Abstract

This is a study of intraoperative mean arterial pressure in obstructive sleep apnea patients undergoing weight loss (bariatric) surgical procedures. Participants are 281 adult patients diagnosed with obstructive sleep apnea within two years prior to their bariatric surgery. In addition to mean arterial pressure, the dataset includes information on demographics, nocturnal oxygen status, comorbidities, type and duration of surgery, vasopressors, and heart rate. The data are cleaned and does contain some missing data. There are no outliers or data problems. The source of these data is the study by Turan et al. "Relationship between Chronic Intermittent Hypoxia and Intraoperative Mean Arterial Pressure in Obstructive Sleep Apnea Patients Having Laparoscopic Bariatric Surgery". *Anesthesiology* 2015; 122: 64-71.

Background

Sleep apnea, literally "without breath", occurs during sleep when one's breath becomes very shallow or briefly stops altogether. Episodes of sleep apnea typically last 20 to 40 seconds and can happen many times a night in some people. Sleep apnea is of various types, one of which is obstructive sleep apnea (OSA) and is the focus of this dataset. OSA has physical causes; it occurs when something partly or completely blocks the upper airway during sleep. OSA is usually associated with a reduction in blood oxygen saturation. Notably, approximately 30% of the general population suffer from OSA.

Obstructive sleep apnea (OSA) is characterized by specific events and their severity. OSA events are of two types: an apnea, characterized by complete cessation of airflow for at least 10 seconds, or a hypopnea in which airflow decreases by 50 percent for 10 seconds or decreases by 30 percent if there is an associated decrease in the oxygen saturation or an arousal from sleep. Sleep apnea severity is the frequency of event occurrence per hour and is assessed using the apnea-hypopnea index (AHI). An AHI of less than 5 is considered normal. An AHI of 5-14 is mild; 15-29 is moderate and 30 or more events per hour characterizes severe sleep apnea.

As a result of OSA, nocturnal oxygenation levels are often lower than normal. Two common measures are the percentage of total sleep time spent at Sao_2 less than 90% and the minimum nocturnal Sao_2 listed in polysomnography reports.

OSA is of concern because of its relationship to cardiovascular disease, with a diagnosis of moderate-to-severe disease (AHI ≥ 15) being identified as an independent risk factor for all-cause and cardiovascular mortality. Patients suffering from OSA present with a chronic enhancement in sympathetic adrenergic activity (system involved in maintaining

homeostasis) that is considered one of the major mechanisms in the development of cardiovascular health issues in this population. Such hemodynamic instability is hypothesized to increase the risk for intraoperative and/or postoperative morbidity in OSA patients undergoing surgery.

Study Objective

This study tested the hypothesis that nocturnal intermittent hypoxia consequent to OSA is associated with decreased intraoperative mean arterial pressure (MAP).

A planned secondary analysis evaluated the relationship between nocturnal oxygenation status and intraoperative use of vasopressors.

Study Design

Retrospective Cohort Study

Subjects & Variables

The study data consists of information on 281 adult patients with a prior diagnosis of OSA (within two years) who underwent laparoscopic bariatric procedures at the Cleveland Clinic between June 2005 and December 2009.

There are two main exposure variables, each describing the nocturnal oxygenation status of the patient: the percentage of total sleep time spent at Sao_2 less than 90% and the minimum nocturnal Sao_2 listed in polysomnography reports.

The primary outcome variable is the time-weighted average (TWA) intraoperative mean arterial pressure (MAP). MAP is a term used to describe an average blood pressure in an individual. It is believed that a MAP > 70 mmHg is enough to sustain the organs of the average person. MAP is normally between 65 and 110 mmHg. If the MAP falls below 70 for an appreciable time, vital organs will not get enough oxygen perfusion, and will become hypoxic, a condition called ischemia.

Additional perioperative study variables include three indicators of intraoperative use of vasopressors (medications that raise reduced blood pressure): ephedrine, epinephrine, and phenylephrine.

Covariate data also includes information on demographics, comorbidities, type and duration of surgery, and heart rate.

N = 281 subjects

36 variables

Additional Information

Citation(s)

Turan et al. "Relationship between Chronic Intermittent Hypoxia and Intraoperative Mean Arterial Pressure in Obstructive Sleep Apnea Patients Having Laparoscopic Bariatric Surgery". *Anesthesiology* 2015; 122: 64-71.

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