**Methods**

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**Data**

We used the Medical Information Mart for Intensive Care III(MIMIC-III) research database in our research[1]. MIMIC is a single-center database that contains high temporal resolution data including vital signs, medications, laboratory measurements, observations and electronic documentations for all patients admitted to Beth Israel Deaconess Medical Center (BIDMC) ICUs between 2001 and 2012[2].

Hypoxemia was defined according to oxygenation index, the ratio of partial pressure of arterial oxygen and fraction of inspired oxygen, we proposed two degrees of hypoxemia: severe and moderate[3]. The observation window for pre- and post- hypoxemia was from -6 hours to +6 hours from onset time.

Among all 46520 MIMIC patients, 4040 patients had severe hypoxemia during their stay. We excluded 403 patients on mechanical ventilation during their stay, 2044 used vasopressor in 6 hours, leaving 1632 unique admissions. We also included a secondary dataset contains 3799 unique admissions of moderate hypoxemia patients without vasopressor use and not on mechanical ventilation.

**Study outcomes**

The primary outcome were mean central venous pressure(CVP) and mean diastolic blood pressure(DBP) measured 6 hours after the onset of hypoxemia comparing with that 6 hours before the event.

**Covariates**

Values of heart rate and PEEP were collected from MIMIC database. Mean value of heart rate and PEEP were calculated in 6 hours before hypoxemia onset comparing to 6 hours after.

**Statistical analyses**

G-method was applied in this study[4]. G-methods are a family of methods that provide more consistent estimates of contrasts of average potential outcomes under time-varying confounders. PEEP and heart rate are potential confounders while comparing CVP and DBP values pre- and post- hypoxemia onset in this study. The advantage of g methods is that……

The data processing was performed using pgAdmin4 and all statistical analyses were performed using R 3.4.3.

**Results**

1. MIMIC-III, a freely accessible critical care database. Johnson AEW, Pollard TJ, Shen L, Lehman L, Feng M, Ghassemi M, Moody B, Szolovits P, Celi LA, and Mark RG. Scientific Data (2016). DOI: [10.1038/sdata.2016.35](http://dx.doi.org/10.1038/sdata.2016.35). Available at: <http://www.nature.com/articles/sdata201635>
2. Pollard, T. J. & Johnson, A. E. W. The MIMIC-III Clinical Database <http://dx.doi.org/10.13026/C2XW26> (2016)
3. Ferguson N D, Fan E, Camporota L, et al. The Berlin definition of ARDS[J]. Intensive Care Medicine, 2012, 38(10):1573.
4. Naimi, Ashley I, Stephen R Cole, and Edward H Kennedy. “An Introduction to G Methods.” *International Journal of Epidemiology*, 2016, dyw323. https://doi.org/10.1093/ije/dyw323.