## 180

# EFFECT OF AIR CUSHION BED ON THE QUALITY OF HANDS-ONLY CHEST COMPRESSION

Min Yang[1], Yangyang Zou[2], Wei Xia[3], shuang cao[3], Tianfeng Hua[3]

**Learning Objectives:** High quality chest compression is the core component of CPR technology. The quality of chest compressions is closely related to compression depth compression frequency, coronary perfusion pressure and chest compression fraction. Air cushion bed routinely used in critically ill patients for preventing pressure sore and venous thrombosis and other nursing problems. The influence of air cushion bed on the quality of cardiopulmonary resuscitation is an unclear problem. The purpose of this study is to investigate the effect of air mattress bed on the quality of chest compression during CPR.

**Methods:** Twenty doctors who had cardiopulmonary resuscitation experience and received a BLS certificate. According to 2015 American Heart Association Guidelines, Chest compression was tested on a manikin for two minutes in every group. According to the order of the A, B, C groups randomly, group A was tested in ordinary bed, group B was compress in air mattress and hard backboard, and group C was tested in air mattress bed. There was a ten minutes rest between each group. All compression data (include compression rate, depth, incomplete recoil and shallow number) were collected via real-time feedback device (Link CPR, SunLife).

**Results:** In terms of the average compression rate, the three groups were 107.9±5.1 cpm, 107.7±4.56 cpm and 109.7±4.86 cpm respectively, and the difference was not statistically significant (P>0.05). There was significantly better in mean compression depth of group A and B than that in group C [(53.45±2.04) mm and (52.65±2.13) mm vs. (48.45±1.36)mm, P<0.05]. The number of shallow compression in the group C was significantly higher than that in the other two groups [(23.6±19.3) and (35.3±33.9) vs. (97.3±23.4), P<0.05]. The retention rates in group A was better than that in group B and C [58.43±4.17)% vs. (62.51±4.37)% and (62.63±4.22)%, P< 0.05].The compression depth of group C in the second minutes of was significantly less than the first minutes (P<0.05), and the number of shallow compression was more than the first minutes (P<0.05).Significant statistical difference in accuracy was observed among the three group(33.64% vs. 28.66% vs. 19.24%, P<0.05).

**Conclusions:** The use of air cushion bed will reduce the quality of chest compression. Eliminating the elasticity of air cushion bed can effectively improve the quality of chest compressions.

[1]the Second Hospital of Anhui Medical University, hefei, [2]the Second Hospital of Anhui Medical University, Hefei, China, [3]the Second Hospital of Anhui Medical University, Hefei, China

## 181

# PERIPHERAL BLOOD HEMATOCRIT IS AN INACCURATE INDEX OF RED CELL VOLUME IN CRITICALLY ILL SUBJECTS

Jae Won Lee[1], Fariha Sheikh[2], Anand Patel[2], David Inouye[2], Danny Takanishi[2], Frank Zhao[3], Mihae Yu[4], Richard Severino[5], Michael Hayashi[1]

**Learning Objectives:** Peripheral blood hematocrit (Hct), a measure of the ratio of red cell volume (RBCV)/total blood volume (BV), has been a conventionally accepted indicator of RBCV. Given that BV = RBCV + Plasma Volume (PV), the Hct may be higher (hemoconcentration) or lower (hemodilution) than the actual RBCV depending on fluctuations that may occur in PV, particularly in critically-ill subjects. BV analysis (BVA-100, Daxor Corporation, NY) allows for measurement of RBCV. After a 5mL sample of blood and a simultaneous Hct are obtained, a known amount of I-131-albumin is injected intravenously over 1-minute and allowed to mix completely over 12-minutes. Five serial blood draws are obtained to correct for albumin transudation and measurements are extrapolated to time zero to obtain PV. The simultaneous Hct analysis allows for calculation of the RBCV. In order to interpret the volumes, the BVA-100 estimates a subject's ideal/normal BV using a validated algorithm based on gender, height, baseline weight and deviation from optimum longevity-related weight (Metropolitan Life Tables). The resulting hematocrit is expressed as a normalized Hct defined as what the Hct would be if the PV was normal. This study evaluated the relationship between the Hct and the normalized Hct.

**Methods:** This is a retrospective study of critically-ill surgical subjects who underwent BV analysis to assist in the determination of intravascular volume between 2010 and 2014. Bland-Altman analysis was used to assess the bias (normalized Hct – Hct) between the 2 sets of values.

**Results:** 195 subjects generated 813 data pairs. Mean bias±2SD was 3.51±11.02, which represented a statistically significant departure from zero (p<0.0001). When subjects were hypovolemic based on BV analysis, the Hct overestimated the normalized Hct by a mean of 3.34 (SD+2.77). When subjects were euvolemic or hypervolemic, the Hct underestimated the normalized Hct by 2.60 (SD+1.50) and 8.76 (SD+3.17), respectively. The differences in mean bias between the 3 groups stratified by intravascular volume status was statistically significant (p<0.001).

**Conclusions:** There is a systematic bias between the 2 methods of RBCV determination depending on BV status. The normalized Hct may be a better indicator of RBCV compared to the Hct, as it takes into account deviations in PV.

[1]University of Hawaii John A. Burns School of Medicine, Honolulu, HI, [2]N/A, Honolulu, HI, [3]University of Hawaii, Honolulu, HI, [4]University of Hawaii School of Medicine, Honolulu, HI, [5]Queen's Medical Center, Honolulu, HI