



## TO STUDY THE EFFECT OF BODY POSITIONS ON OXYGEN SATURATION AND PEFR IN POST CORONARY ARTERY BYPASS GRAFT PATIENTS

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**ABSTRACT** CABG is the most common type of heart surgery. Reduced pulmonary functions and oxygen saturation are common post-operative complications. Body positions tends to show effect on peak expiratory flow rate and oxygen saturation .so, in this study we have observed effects of different body positions in values of PEFR and oxygen saturation for better recovery from post-operative complications. Objective was to evaluate the differences in values of PEFR and oxygen saturation in different body positions (supine, erect sitting, three quarter sitting, standing). Method: the study design was observational cross-sectional study. 30 subjects of age group 40-70 years were selected through random sampling technique. PEFR and oxygen saturation values were checked on post-operative day 3. subjects were allocated each position for 15 min and then values were recorded. **Results:** the study results indicated that standing position shows highest PEFR value (340.67 liters/min) and best oxygen saturation (97.53), supine position shows lowest PEFR value (183.00 liters/min) and lowest oxygen saturation (93.43). Difference in between the body positions three quarter sitting, sitting and supine were significant ( $p < 0.005$ ) when compared with standing. **Conclusion:** The study concluded that standing position leads to highest PEFR and oxygen saturation value and supine position leads to lowest value of PEFR and oxygen saturation. So standing should be considered as best therapeutic position.

**KEYWORDS :** post CABG, body positions, peak expiratory flow rate, oxygen saturation

### INTRODUCTION

Coronary artery disease is caused by plaque formation in the wall of coronary arteries that supply blood to the heart. Plaque is created from fat, cholesterol, calcium, and alternative substances found within the blood. Narrowing of arteries occurs overtime due to plaque formation.

Coronary artery disease can weaken the heart muscle over the time. This may lead to heart failure, where the heart can't pump blood normally. Coronary artery bypass graft is a revascularization technique which involves employing a new artery or vein from other part of the body to bypass the blocked vessels, restoring adequate blood flow to the heart. Arteries from within the chest wall, the arm, or veins from the leg, are harvested. Commonly used is internal mammary artery and saphaneous vein graft. Some of the common Post operative problem list are: Pain, Decreased air entry, Retained secretions, Reduced oxygen saturation. The aetiology of worsening in pulmonary function after CABG surgery is multifactorial like: reduced skeletal structure expansion, uncoordinated chest wall motion, diaphragmatic dysfunction because of spinal nerve injury, pleural fluid accumulation and atelectasis, dysfunction of respiratory muscles.

Positioning is considered as an integral part of respiratory care which has following beneficial effects: prevent retention of secretions, optimize oxygen transport in acute cardiopulmonary dysfunction, improve (V/Q) relationships, Clearance, to reduce the work of breathing and work of heart, To relieve pressure from sensitive areas, To improve patients comfort. Appropriate positioning can dramatically improve gas exchange and lung volume,

### PURPOSE OF THE STUDY

It was to find out the most effective position in which oxygen saturation is best maintained and peak expiratory flow is highest which will further enable us to deliver cardiopulmonary physical therapy in the most effective way for faster postoperative recovery.

### OBJECTIVE OF THE STUDY

- 1) To evaluate the differences in values of PEFR in different body positions which are supine, sitting, three quarter sitting, standing.
- 2) To evaluate the differences in values of oxygen saturation in different body positions which are supine, sitting, three quarter sitting, standing.

### HYPOTHESIS

#### NULL HYPOTHESIS

- 1) There will be no significant differences in PEFR values between different body positions which are supine, sitting, three quarter sitting, standing.
- 2) There will be no significant differences in oxygen saturation values between different body positions which are supine, sitting, three quarter sitting, standing.

### ALTERNATE HYPOTHESIS

- 1) There will be significant change in PEFR values between different body positions which are supine, sitting, three quarter sitting, standing.
- 2) There will be significant change in oxygen saturation values between different body positions which are supine, sitting, three quarter sitting, standing.

### METHODOLOGY

Total 40 subjects within the age bracket of 40 -70 years were included within the study out of which 30 subjects had fulfilled the inclusion criteria was found to be deemed fit as sample. For taking the readings postoperative day 3 was selected as patient is moved out of intensive care unit on that day and is allowed to completely mobilize. Subjects were put into each test position for 15 minutes and then they were asked to perform the PEFR test procedure without altering the position and in same position oxygen saturation was measured by pulse oximeter.

### RESULT

Study results shows that the difference among the four positions was statistically significant ( $P < 0.05$ ), showing that mean PEFR of patients changes significantly with different positions. The mean PEFR is the highest at Standing (340.67 liters/min) and it shows the lowest score at Supine Position (183.00 liters/min). Also, the difference among the four positions was found to be statistically significant ( $P < 0.05$ ), showing that mean SPO2 of patients changes significantly with different positions. The mean SPO2 is the highest at Standing (97.53%) and it shows the lowest score at Supine Position (93.43%).

**Table 1- Comparison Of Mean Pefr Litres/minute Of Patients At Different Positions**

Variable	Position	N	Mean	Std. Deviation	F Value	P Value
PEFR liters/min	Standing	30	340.67	134.008	9.967	0.000
	Sitting	30	282.33	126.972		
	Three Quart Sitting	30	232.33	111.222		
	Supine	30	183.00	92.369		
	Total	120	259.58	129.818		

**Table 2-Comparison Of Mean Oxygen Saturation (%) Of Patients At Different Positions**

Variable	Position	N	Mean	Std. Deviation	F Value	P Value
Oxygen saturation (%)	Standing	30	97.53	1.358	25.030	0.000
	Sitting	30	96.40	1.850		
	Three Quarter Sitting	30	96.70	1.664		
	Supine	30	93.43	2.700		
	Total	120	96.02	2.480		

### DISCUSSION

Changes in body positions considerably affected PEFR. Result of

present study is in accordance with the result of Meghan Metha , Kiran Pawar (2016), Charbel badr et al (2002) and Elkins MR, Alison JA (2005) which concluded that PEFr values were higher in standing position and lowest in supine and head down positions. the more upright the position the better is the excursion of the diaphragm and the abdominals are also in a better length tension relationship to contract leading to higher PEFr. more upright positions are better in terms of improved ventilatory mechanism and ventilation–perfusion matching. The upright standing position maximizes lung volumes and capacities with the exception of closing volume, which is decreased (Svanberg, 1957) so the oxygen saturation is increased in standing position. In supine position chest wall configuration is altered, the AP configuration becomes more transverse with decreased expansion, diaphragm gets displaced cephalic and encroachment of abdominal viscera, increased intra thoracic pressure, reduced FRC, decreased compliance and increased airway resistance leads to lowest PEFr and oxygen saturation.

### CONCLUSION

The study “The effect of body positions on oxygen saturation and PEFr in post coronary artery bypass graft patients” shows significant results that body positions affects oxygen saturation and PEFr values in post CABG patients.

Hence, null hypothesis is rejected and alternate hypothesis accepted which states that the standing position leads to highest PEFr and oxygen saturation value and supine position leads to lowest value of PEFr and oxygen saturation. So standing should be considered as best position for improving oxygen saturation and huffing and coughing.

### LIMITATIONS

- 1) Study was conducted on small sample size.
- 2) The effect of drugs on cardio-pulmonary hemodynamics cannot be controlled.
- 3) No intervention has been given.

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