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Postoperative Cardiac Surgery Complications that Prolonged Mechanical Ventilation

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Abstract

Cardiac surgery is a strongest option to manage coronary artery and cardiac valves diseases. The aims of this study is to determine the postoperative complications of cardiac surgery which causing prolonged mechanical ventilation. Retrospective study was conducted at cardiac center, and it was carried out in the period from 20 June 2020 to 20 May 2021. A total of 50 adults exposed to prolonged mechanical ventilation post cardiac surgery were enrolled. Data collection include mode of ventilation, bleeding, arrhythmia, pressure, infarction, stroke, infection, and tubation complications. Data were analyzed by using frequency, percentage and mean plus standard deviation. Simv mode of MV recorded in 70% of cases, while PS applied on 22% and CVM applied on 8% of cases. Out of 50 patients, 33(66%) were bleed between 500 ml to 1000 ml whereas the rest loss about 1000 ml to 2000 ml. Positive pressure used in 36% of cases. Approximately, 16% of patients suffered from atrial arrhythmia, 8% from ventricular arrhythmia, and 80% of cases were dysrhythmia. Regarding tubation complication were trauma in 52%, ulceration in 30% and pulmonary edema in 18%. Concerning the stroke, 18% of cases exposed to stroke, while 82% of patients had not. Indeed, infarction was reported in 30% of cases. In addition, two cases suffered from infection. Many complications can be prolong mechanical ventilation post cardiac surgery. Bleeding, arrhythmias, infection, infarction, tubation ulcer, tubation traumas, pulmonary edema, stroke, and ventilation modes can be consider as main complications causing prolong MV beyond cardiac surgery.

Keywords: postoperative complication, mechanical ventilation, cardiac surgery, coronary artery diseases, stroke

Introductions

Directly, switched off from mechanical ventilation and tubation is proceeding. Early tubation cause respiratory distress, heart failure, infarction and may be ischemia [1]. Surgical procedures of heart carry morbidity and mortality which is high [2], because of the nature of the surgery, and the

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satisfactory of patients [1, 2]. The great risk factors are the negative consequences of surgery, older age, emergency cases, and previous surgery [3].

Mechanical ventilation (MV) is include invasive procedure of mechanical fresh air with intubation, air ventilation positive pressure, sedative and muscles relaxants [4]. Tubation can end with tracheal trauma, tracheal ulcer, pulmonary edema and swelling [4]. The number of patients who are receiving mechanical ventilation and support life is elevated as a result of improvements in life to provide medical management for urgent cases [4, 5]. An estimation by researchers indicate that the cases who are receiving mechanical ventilation for cardiac problems in USA was doubled by 2020 [6].

The aims of this study is to determine the postoperative cardiac surgery complications which causing prolonged mechanical ventilation.

Methods

Retrospective study design was conducted and carried out on a sample of 50 adults patients whom stayed on prolonged MV postoperative surgery. Data collection include mode of ventilation, bleeding, arrhythmia, pressure, infarction, stroke, infection, and tubation complications. Data were analyzed by using frequency, percentage and mean plus standard deviation.

Results

Simv mode of MV recorded in 70% of cases, while PS applied on 22% and CVM applied on 8% of cases. Out of 50 patients, 33(66%) were bleed between 500 ml to 1000 ml whereas the rest loss about 1000 ml to 2000 ml. Positive pressure used in 36% of cases. Approximately, 16% of patients suffered from atrial arrhythmia, 8% from ventricular arrhythmia, and 80% of cases were dysrhythmia. Regarding tubation complication were trauma in 52%, ulceration in 30% and pulmonary edema in 18%. Concerning the stroke, 18% of cases exposed to stroke, while 82% of patients had not. Indeed, infarction was reported in 30% of cases. In addition, two cases suffered from infection.

Table: Postoperative complications of cardiac surgery.

Complications		No.	%
Modes	Synchronized Intermittent Mandatory Ventilation (Simv)	35	70
	Pressure support (PS)	11	22
	Control volume mode (CVM)	4	8
Bleeding (ml)	<500-1000	33	66
	>1000-2000	17	34
Positive pressure	Yes	18	36
	No	32	64
Arrhythmia	Atrial	8	16
	Ventricular	2	4
	Dysrhythmia	40	80
Tubation	Trauma	26	52
	Ulcer	15	30

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	Edema	**9**	**18**
Stroke	**Yes**	**9**	**18**
	No	**41**	**82**
Infarction	**Yes**	**15**	**30**
	No	**35**	**70**
Infection	**Yes**	**2**	**4**
	No	**48**	**96**

Discussion

In this study, Simv mode of MV recorded in 70% of cases, while PS applied on 22% and CVM applied on 8% of cases. Out of 50 patients, 33(66%) were bleed between 500 ml to 1000 ml whereas the rest loss about 1000 ml to 2000 ml. Positive pressure used in 36% of cases. These findings are consistent with Ji et al [7] in China and Alsarraji et al [8] in Iraq. In term of ventilator modes, bleeding volume and stroke, they studied the preoperative, intraoperative, and postoperative variables of cases undergoing CABG at the Tongji Hospital were retrospectively analyzed [7].

Approximately, 16% of patients suffered from atrial arrhythmia, 8% from ventricular arrhythmia, and 80% of cases were dysrhythmia. Regarding tubation complication were trauma in 52%, ulceration in 30% and pulmonary edema in 18%. This finding supported with result obtain by Saleh et al [9], which found that 13.5% of cases with prolonged ventilation acquired intervention to overcome the outcomes.

Concerning the stroke, 18% of cases exposed to stroke, while 82% of patients had not. Indeed, infarction was reported in 30% of cases. In addition, two cases suffered from infection. This data similar to a study done by Ji et al [7]. Also, it was similar to that obtained from Siddiqui et al [10], in their study to identify complications for prolonged MV post open heart surgery, they found 3% of cases had infection.

Our finding revealed a significant association between the bleeding which was supported with the data published by Alsarraji et al [8], Grothusen et al [11], and Vivacqua et al [12].

Tubation complications in this work are several and similar to that obtained from Alsarraji et al [8], Camp et al [13] and Babatabar et al [14]. Jian et al [15], found a significant association between the re-intubation and period of mechanical ventilation.

Sevket et al, reported a significant association between ventricular arrhythmia and prolonged ventilation after heart valve surgery [16]. Guaragna et al, found that stroke and prolonged MV when he studied major neurologic dysfunction after coronary bypass surgery [17].

Silva and Barbosa, mentioned that the infection is a one of the complication in patients undergoing cardiac surgery [18].

Conclusion

Many complications can be prolong mechanical ventilation post cardiac surgery. Bleeding, arrhythmias, infection, infarction, tubation ulcer, tubation traumas, pulmonary edema, stroke, and

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ventilation modes can be consider as main complications causing prolong MV beyond cardiac surgery.

Conflict of interest: none.

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