

Postoperative Risk Factors of Surgical Cardiac patients' that Leading to Prolonged Mechanical Ventilation at South Iraq Cardiac Centers

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ABSTRACT

Cardiac surgery is a Common way to treat diseases of coronary artery and valves disease. Weaning from mechanical ventilation and extubation of endotracheal tube usually proceed directly. Objective(s): to assess the postoperative risk Factors of surgical cardiac patients' which leading to prolonged mechanical ventilation. To identify the relationships between duration of intubation of mechanical ventilation and postoperative risk factors. Retrospective study design was conducted to determine the postoperative risk factors that leading to prolonged mechanical ventilation for surgical cardiac patients' at south Iraq cardiac centers. The study was carried out during the period extended from 21 March 2018 to 31 June, 2018 A non- probability sample of 100 adults patients records who stayed on prolonged mechanical ventilation after cardiac surgery admitted in thi qar center for heart diseases. The result of postoperative risk factors for (100) patients Indicated that the (66%) of the sample were at Simv mode in related to ventilator modes. According to the perioperative IABP requirement the table indicated that the (10 %) of the patients need to IABP. Significant relationship between the duration of stay on mechanical ventilation with, quantity of bleeding, reoperation for bleeding, reintubation, ventricular arrhythmia, stroke and infection level significantly less or equal. 0.05.

Keyword: *postoperative risk factors, duration of intubation, cardiac surgery patients.*

INTRODUCTION

Cardiac surgery is a Common way to treat diseases of coronary artery and valves disease. Weaning from mechanical ventilation and extubation of endo tracheal tube usually proceed directly. Patients who extubation of endotracheal tube before time may reflect premature extubation or may be a marker of sicker patients. Too early extubation may result in disruption of respiratory, right heart failure, and myocardial infarction and ischemia¹. Cardiac surgical procedure carries morbidity and mortality relatively high compared with most other surgical operations. This is not only because of the nature

of the surgery itself, but also because of the satisfactory common heart and respiratory and other. Before Surgery focus should be on the Patients history and examination of the assessment of the severity of the heart disease ischemic heart failure, as well as the existence of common and severity illness such as diabetes, high blood pressure and diseases related to smoking². The main risk factors include the negative consequences of cardiac surgery advanced age, emergency surgery, previous heart surgery, dialysis dependence, and creatinine level of 2 mg/dL or higher (Renal failure before the surgery is an independent risk factor rates of morbidity and mortality³. Mechanical ventilation (MV) is one of the main actions in the comprehensive care unit (ICU). That includes Invasive mechanical fresh air (mv) Procedure: intubation, the course of the air ventilation positive pressure, often application of sedative and muscles relaxants. Endotracheal pipe can cause damage to the trachea, ulceration of trachea, pulmonary edema

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and swelling⁴. The duration of mechanical ventilation for patients with heart surgery is among the factors that affects the morbidity and mortality rates, as well as the cost of the procedure and use of health-care resources in general. Many of the investigators in the delayed extubation the patient with high mortality rates⁵. The number of patients who are receiving mechanical ventilation and support life is growing rapidly as a result of improvements in life to provide medical treatment for patients with critical cases, anaging population and expanding the use of the surgical operations of aggression. Long periods of historical annual increase in the use of mechanical ventilation in the United States nearly 5.5% compared with an increase of 1% annually in the hospitals in the United States. Estimates indicate that the number of the population of patients who are receiving mechanical ventilation for extended periods of time in the United States and more than doubled by 2020 and about 605898 cases⁶. Increase duration of mechanical ventilation leading to high cost and effort for health policies. The aim of this study was to identify the risk factors for prolonged mechanical ventilation.

MATERIALS AND METHODS

Retrospective study design was conducted to determine the postoperative risk factors that leading to prolonged mechanical ventilation for surgical cardiac patients' at south Iraq cardiac centers. The study was carried out during the period extended from 21 March 2018 to 31 June, 2018. A non- probability (purposive) sample of 100 adults patients chart who stayed on prolonged mechanical ventilation after cardiac surgery admitted in Thi Qar center for cardiac surgery in south Iraq through two years (2016-2017). Data was collected by revision the patient's chart. Questionnaire form was constructed for purpose of the study and it comprised of from (10) common postoperative risk factors related to patient with cardiac surgery. Validity of the questionnaire was determine through a panel of (10) experts. Reliability and validity of questionnaire was determined through Cronbach Alpha = 0.80. Data were analyzed by using descriptive statistical approach (frequency, percentage and mean of score) and inferential statistical approach (standard deviation and independent sample t-test and Anova test).

RESULTS AND DISCUSSION

The result of postoperative risk factors for (100)

patients indicated that the (66%) of the sample were at Simv mode in related to ventilator modes. Regarding to quantity of bleeding the highest percentage (59 %) of the patients lost (25-500)ml. According to the perioperative IABP requirement the table indicated that the (14 %) of the patients need to IABP. Concerning the Re-operation for bleeding the table showed that the (14 %) of the patients Re-operation for bleeding. Related to Re-intubation the table declared that the (5 %) of the patients Re-intubation. According to the atrial arrhythmia the table explained that the (17 %) of the patients with atrial arrhythmia. Regarding to ventricular arrhythmia the table indicated that the (3 %) of the patients with ventricular arrhythmia. In related to the renal disorders the table showed that the (9 %) of the patients with renal disorders. Concerning the stroke (17%) of patients had stroke, (3%) of patients with infection risk factors. This table (2) shows that a statistical significant association between duration of intubation with quantity of bleeding, reoperation for bleeding, reintubation, Ventricular Arrhythmia, Stroke and infection.(P value ≥ 0.05), while there were no statistical association between duration of intubation with (ventilator modes, IABP requirement, atrial arrhythmia and renal disorder). The result of postoperative risk factors for (100) patients Indicated that the (66%) of the sample had Simv mode in relation to ventilator modes. Regarding to the quantity of bleeding, the mean of quantity of bleeding of the patients were (463.25) ml. and (17%) of patients have stroke. The current study was consistent with⁷ in term ventilator modes, quantity of bleeding and stroke who study the Preoperative, intraoperative, and postoperative characteristics of patients undergoing isolated CABG between June 2005 and June 2008 at the Tongji Hospital were retrospectively analyzed, To evaluate the independent risk factors for late extubation after coronary artery bypass grafting he found that the mean of quantity of drainage was (362) ml and (17%) of patients have stroke. The finding showed that the (14%) of the patients need to IABP. This finding supported with result obtain by⁸ which found that the (13.5 %) of patients with prolonged ventilation need to the Intra-aortic balloon pump in their study to determine outcomes and predictors of prolonged ventilation in patients undergoing elective coronary surgery. Concerning the Re-operation for bleeding the table showed that the (4%) of the patients had Re-operation for bleeding and that the (12 %) of the patients with ventricular arrhythmia. In related to the renal disorders, the results indicated

that the (9%) of the patients had renal disorders. This result comes along with a study done by ⁽⁷⁾ there were studied pre-, intra- and post-operative data of patients without a history of chronic obstructive pulmonary disease undergoing isolated CABG from January 2003 to December 2008 in our center were retrospectively analyzed, to evaluate the independent risk factors for ventilator dependency following coronary artery bypass grafting which found that (5.4%) of patients Re-operation for bleeding and that the (1.2 %) of the patients with ventricular arrhythmia. In regarding to the renal disorders, he found that the (12.3%) of the patients had renal disorders. Related to Re-intubation, the table showed that the (5 %) of the patients have Re-intubation and (17 %) of the patients had atrial arrhythmia. In regarding to infection the results indicated that the (3%) of patients had infection. This result was similar to that obtained from ⁹ in their study to identify the risk factors for prolonged invasive mechanical ventilation after open heart surgery they found (3%) of patients with prolonged mechanical ventilation had infection. This finding showed a statistical significant association between the quantity of bleeding and duration of intubation. This finding was supported with the result obtained by ¹⁰ who stated the significant association between bleeding after cardiac surgery and prolonged ventilation. This result was supported by ¹¹ who stated the statistical significant association between bleeding after cardiac surgery and prolonged ventilation and the bleeding important cause for prolonged mechanical ventilation. A statistical significant association was found between reoperation for bleeding and duration of

intubation. This result was similar to that obtained from ¹² who indicated the significant association between the reoperation for bleeding and duration of intubation¹³ supported this finding through their study which stated that the significant association between the bleeding and duration of intubation. There was statistical significant association between reintubation and duration of intubation. This result comes along with a study done by ¹⁴ who stated that the significant association between the re-intubation and total time of mechanical ventilation in their study endotracheal re-intubation following coronary artery bypass grafting. There was statistical significant association between the ventricular arrhythmia and duration of intubation. This result was similar to that obtained from ¹⁵ indicated that the significant association between Ventricular Arrhythmia and Prolonged ventilation after adult heart valve surgery. There was statistical significant association between the Stroke and duration of intubation. This result is confirmed by ¹⁶ who stated that the statistical significant association between Stroke and prolonged mechanical ventilation when he studied major neurologic dysfunction after coronary bypass surgery. There were statistical significant association between infection and duration of intubation, this result was supported by ¹⁷ which refer to that the significant association between the infection and duration of intubation in patients undergoing cardiac surgery. In addition to no significant association between duration of intubation with (P value \geq 0.05). There was no statistical association between ventilator modes, atrial arrhythmia IABP requirement, renal disorder and duration of intubation.

Table1. Distribution of Cardiac Surgery Patients with Prolonged Mechanical Ventilation by their Postoperative Risk Factors. N= 100

Postoperative Risk Factors		F.	%
Ventilator Modes	SIMV	66	66
	PS	29	29
	CVM	5	5
	Total	100	100
Quantity Of Bleeding	(25-500)ml	59	59
	(525-1000)ml	3	3
	(1025-1500)ml	36	36
	(1525-2000)ml	2	2
	Total	100	100

Cont... Table1. Distribution of Cardiac Surgery Patients with Prolonged Mechanical Ventilation by their Postoperative Risk Factors. N= 100

Perioperative IABP requirement No Total	Yes	14	14
	86	86	
	100	100	
Reoperation For Bleeding No Total	Yes	12	12
	88	88	
	100	100	
Reintubation No Total	Yes	5	5
	95	95	
	100	100	
Atrial Arrhythmia No Total	Yes	17	17
	83	83	
	100	100	
VentricularArrhythmia No Total	Yes	3	3
	97	97	
	100	100	
Renal disorder No Total	Yes	9	9
	91	91	
	100	100	
Stroke No Total	Yes	17	17
	83	83	
	100	100	
Infection No Total	Yes	3	3
	97	97	
	100	100	

Table 2. Association between Duration of Intubation and Postoperative Risk Factors among Cardiac Surgery Patients with Prolonged Mechanical Ventilation.

Duration Of Intubation			
Quantity Of Bleeding	No.	%	Mean ±SD
(25-500)ml	59	59	16.27 ±3.468
(525-1000)ml	36	36	15.22 ±2.919
(1025-1500)ml	3	3	19.00 ±5.831
(1525-2000)ml	2	2	16.03 ±3.486
Duration Of Intubation			
Ventilator Modes	No.	%	Mean ±SD
SIMV	66	66	14.98±2.581
PS	29	29	17.03±3.343
CVM	5	5	24.00±3.082
Duration Of Intubation			
IABP requirement	No.	%	Mean ±SD

Cont... Table 2. Association between Duration of Intubation and Postoperative Risk Factors among Cardiac Surgery Patients with Prolonged Mechanical Ventilation.

Yes	10	10	17.30 ± 5.078
No	90	15.89 ± 3.272	
90			
Duration Of Intubation			
Reoperation For Bleeding	No.	%	Mean ±SD
Yes	4	4	20.25 ± 5.909
No	96	96	15.85 ± 3.283
Duration Of Intubation			
Reintubation	No.	%	Mean ±SD
Yes	5	5	22.50 ± 4.950
No	95	95	15.90 ± 3.357
Duration Of Intubation			
Atrial Arrhythmia	No.	%	Mean ±SD
Yes	17	17	15.82 ± 2.942
No	83	83	16.07 ± 3.601
Duration Of Intubation			
Ventricular Arrhythmia	No.	%	Mean ±SD
Yes	3	3	19.90 ± 3.033
No	97	97	15.90 ± 3.489
Duration Of Intubation			
Renal Disorder	No.	%	Mean ±SD
Yes	9	9	16.78 ± 5.167
No	91	91	15.96 ± 3.306
Duration Of Intubation			
Stroke	No.	%	Mean ±SD
Yes	1	1	26.00 ± 0.000
No	99	99	15.93 ± 3.354

CONCLUSION

From the result we can conclude, that the quantity of bleeding, reoperation for bleeding, reintubation, ventricular arrhythmia, stroke and infection seem to be strongly associated with delayed tracheal extubation contributing to patients for prolonged mechanical ventilation.

Financial Disclosure: There is no financial disclosure.

Conflict of Interest: None to declare.

Ethical Clearance: All experimental protocols were approved under the Community Health Nursing Department, College of Nursing/ University of Misan

and all experiments were carried out in accordance with approved guidelines.

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