Impact of Preoperative Risk Factors upon Duration of Intubation for Cardiosurgery Patients in Ibn-Al-Bettarcenter.

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تأثير عوامل الخطورة قبل العملية لمرضى جراحة القلب على مدة بقاء التهوية الصناعية في مركز ابن البيطار .

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الخلاصة

الهدف :تهدف الدراسة الحالية إلى تقييم عوامل الخطورة لمرضى جراحة القلب على مدة بقاء أنبوب التهوية الصناعية وإيجادالعلاقة بين مدة بقاء الأنبوب بعد العملية وعوامل الخطورة قبل العملية .

المنهجية : دراسة وصفية (غرضية) أجريت في مركز جراحة القلب في مدينة بغداد للمدة من العاشر من تشرين الأول 2013 ولغاية العشرين من آب 2014 وتم اختيار عينة غرضية غير احتمالية لـ 100 مريض بعد التداخل الجراحي وبقاء المريض على جهاز التهوية الميكانيكية لمدة 12 ساعة وجمعت المعلومات من سجلات لمرضى وتم ملئ الاستبانة المتكونة من جزأين حيث تضمن الجزء الأول التاريخ الطبي والجراحي للمريض والجزء الثاني تكون سبعة فقرات والمتضمنة) عوامل الخطورة قبل جراحة القلب وتم تحديد ثبات الاستبانة من خلال قياس التطابق الداخلي بين الفقرات بعد تطبيق مقياس كرونباخ الفا والمساوي**0.796** = وحددت مصداقيتها من خلال عرضها على 19 خبراء من ذوي الاختصاص ولتحليل البيانات تم استعمال الإحصاء الوصفي الذي تضمن التكرارات والنسب المئوية والوسط الحسابي والانحراف المعياري والإحصاء الاستدلالي الذي شمل اختبار t واختبار تحليل التباين.

النتائج :أشارت نتائج الدراسة الحالية أن معظم أفراد العينة هم من الذكور تتراوح أعمارهم بين (48- 78) سنة وان (48٪) من العينة مصابون بمرض السكري، و (66٪) مصابين بارتفاع ضغط الدم، وكان معظمهم لديه ارتفاع في نسبة الدهون في الدم، (64٪) مصابين بالذبحة الصدرية الذبحة الصدرية، وأن (37٪) من المرضى لديهم مشكلات في صمامات القلب ،.وبينت نتائج الدراسة بوجود علاقة ذات دلالة إحصائية بان عوامل الخطورة (العمر والجنس) ومدة بقاء انبوب التهوية الصناعية .

الاستنتاجات: إن زيادة العمر والجنس لها ارتباط قوي مع تأخر إزالة الأنبوب وتسهم الدراسة في التنبؤ المبكر للمرضى من لهم خطورة عالية للتهوية طويلة الأمد.

التوصيات :بناءا "على نتائج الدراسة الحالية يوصي الباحثان بأتباع برتوكول الفاست تراكت للعناية القلبية لغرض العناية بالمريض بعد جراحة القلب وخصوصاً في عملية فطام المريض عن جهاز التهوية الميكانيكية وصولاً إلى إزالته .

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Abstract

Objective: Theaims of present study to assess the risk factors for heart surgery patients on duration of intubation of mechanical ventilation and to find the relationship between the duration of mechanical ventilation after the operation with preoperative risk factors.

Methodology: descriptive study (purposive) conducted in the Ibn-Al-Bettar center for cardiac surgery in the city of Baghdad for the duration of the tenth of October 2013 until the twentieth of August 2014 and the sample was selected object-non-probability for 100 patients after surgical intervention and the survival of the patient on a mechanical ventilation for 12 hours and more and collected information from patients charts and fill out the questionnaire consisting of two parts, as its first part on information medical history and surgical treatment of the patient and the second part of the seven items included (preoperative risk factors were identified reliability resolution by measuring the congruence of internal between the vertebrae after applying gauge Cronbach Alpha and equal = 0.796 and identified validity through 19 experts from specialists and data analysis were used descriptive statistics which included frequencies, percentages, and the mean, standard deviation and statistics inferential, which included independent sample t-test and Anova test .

Results: The results of the present study that most of the members of the sample were males between the ages of (48-78) years and that (48%) of the sample have diabetes, and (66%) of the patients had high blood pressure, and it was mostly has high the proportion of fat in the blood, (64%) of the patients had angina pectoris, and that (37%) of the patients have a valve diseases,. In related to risk factors there was a relationship between the duration of stay on mechanical ventilation with age, sex, level significantly less or equal. 0.05.

Conclusions: The increased age and the gender seem to be strongly associated with delayed tracheal extubation contributing to the early prediction of high risk patients for prolonged ventilation.

Recommendations: Based "on the results of the current study, the researchers recommended to follow a fast-tarck protocol for the purpose of patient care after cardiac surgery, especially in the process of weaning patient from mechanical ventilation device down to remove it.

Keyword: impact, preoperative risk factors, duration of intubation, cardiosurgery patients.

INTRODUCTION

Heart surgery is a common way to treat diseases of coronary artery and valves disease. Weaning from mechanical ventilation and extubation of endotracheal tube usually proceeds directly. Patients had failed to carry on the extubation of endotracheal tube or extubation before time may be a sign of sick. Too early extubation may result in disruption of respiratory, right heart failure, and myocardial infarction and ischemia (Sabzi and Teimouri 2007).

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. Should focus on Before Surgery Patients taking history and examination of the assessment of the severity of the heart disease ischemic heart failure, as well as to determine the existence of common and severity illness such as diabetes, high blood pressure and diseases related to smoking (Mekkawy and EL-Minshawy 2012).

The duration of mechanical ventilation for patients with heart surgery is among the factors that affect the results of the patients, from where 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 rates (Cislaghi 2009).

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 mortality (Mageed& El-Ghoniemy, 2007).

One of the most important body system affected by the coronary artery bypass graft patients, is the respiratory system. In addition, complications with pulmonary are among the primary complication facing After Heart Surgery (Ferasatkish 2008).

The aims of present study to assess the risk factors for heart surgery patients on duration of intubation of mechanical ventilation and to find the relationship between the duration of mechanical ventilation after the operation with preoperative risk factors.

METHODOLOGY:

Descriptive study (purposive study) conducted in the Ibn-Al-Bettar center for cardiac surgery in the city of Baghdad for the duration of the tenth of October 2013 until the twentieth of August 2014 and the sample was selected object-non-probability for 100 patients after surgical intervention and the survival of the patient on a mechanical ventilation for 12 hours and more for surgical operations through two years (2012-2013) and collected information from patients charts and fill out the questionnaire consisting of two parts, as its first part on information medical history and surgical treatment of the patient and the second part of the fourteen items included (pre, and intraoperative risk factors were identified reliability resolution by measuring the congruence of internal between the vertebrae after applying gauge Cronbach Alpha and equal = 0.796 and identified validity through 19 experts from specialists and data analysis were used descriptive statistics which included frequencies, percentages, and the mean, standard deviation and statistics inferential, which include independent sample t-test and Anova test.

RESULTS:

Table 1: Distribution of Cardiac Surgery Patients by their Preoperative Risk Factors. N = 100

Preoperative Risk Factors		F.	%
Gender	Male	56	56
	Female	44	44
	Total	100	100.0
Age (year)	47-50	2	2
	51-54	2	2
	55-58	10	10
	59-62	30	30
	63-66	22	22
	67-70	18	18
	71-74	12	12
	75-78	4	4
	Total	100	100.0
	Mean ± SD	64.21±5.800	
Body Mass Index	Under Weight	0	0
	Normal	16	16
	Over Weight	44	44
	Obese	37	37
	Extreme Obesity	3	3
	Total	100	100.0
	Mean ± SD	29.56±4.521	
Ejection Fraction	55-70% (normal)	54	54
	< 55% (Below normal).	46	46
	Total	100	100.0
	Mean ± SD	52.35±7.66	
Creatinine Level(mg/dl)	Normal	81	81
	Elevated	19	19
	Total	100	100.0
	Mean ± SD	1.03±0.48	
Cardiac Arrhythmia	Yes	16	16
	No	84	84
	Total	100	100
Smoking	Yes	32	32
	No	68	68
	Total	100	100

F = frequency, % = percentage

The findings of the table (2) revealed that the most of study sample was males (56%), high percentage age group 59-62 years old, Regarding to body mass index the highest percentage

(44 %) of the patients were overweight, In related to the ejection fraction (54 %) were normal ejection fraction, Concerning the creatinine level the (81%) is normal level, according to cardiac arrhythmia that the (16 %) of the patients have cardiac arrhythmia, related to smoking (32 %) were smoking.

Table 2: Distribution of Cardiac Surgery Patients by their past Medical and Surgical History. NO = 100

Variable		F.	%
	Yes	48	48
Diabetes Mellitus	No	52	52
	Total	100	100
	Yes	66	66
Hypertension	No	34	34
	Total	100	100
	High Cholesterol	54	54
Cholesterol Level	Normal	46	46
	Total	100	100
	Yes	64	64
Angina	No	36	36
	Total	100	100
	Yes	9	9
Myocardial Infraction	No	91	91
	Total	100	100
	Yes	37	37
Valve Diseases	No	63	63
	Total	100	100
	Yes	7	7
Renal Diseases	No	93	93
	Total	100	100
	Yes	3	3
Cerebrovascularaccident	No	97	97
	Total	100	100
	Yes	68	68
Cardiac Catheterization	No	32	32
	Total	100	100
	Yes	2	2
Previous Cardiac Surgery	No	98	98
	Total	100	100
Previous Non cardiac Surgery	Yes	13	13
	No	87	87
	Total	100	100

F = frequency, % = percentage

The findings of the present study revealed that the (48%) of the sample were Diabetes Mellitus, (66%) of the patients have Hypertension, majority of them had hypercholesterolemia, (64%) of the patients have angina, Related to myocardial infarction (9%) of patients have myocardial infarction, concerning the valve diseases (37%) of patients have valve diseases, (7%) of patents have renal diseases, regarding Cerebrovascular accident, Cardiac catheterization, previous cardiac surgery, Previous non cardiac surgery; (3%) of patents have Cerebrovascular accident, (68%) of patents have were cardiac catheterization, (2%) of patents have previous cardiac surgery, (13%) of patents have previous non cardiac surgery.
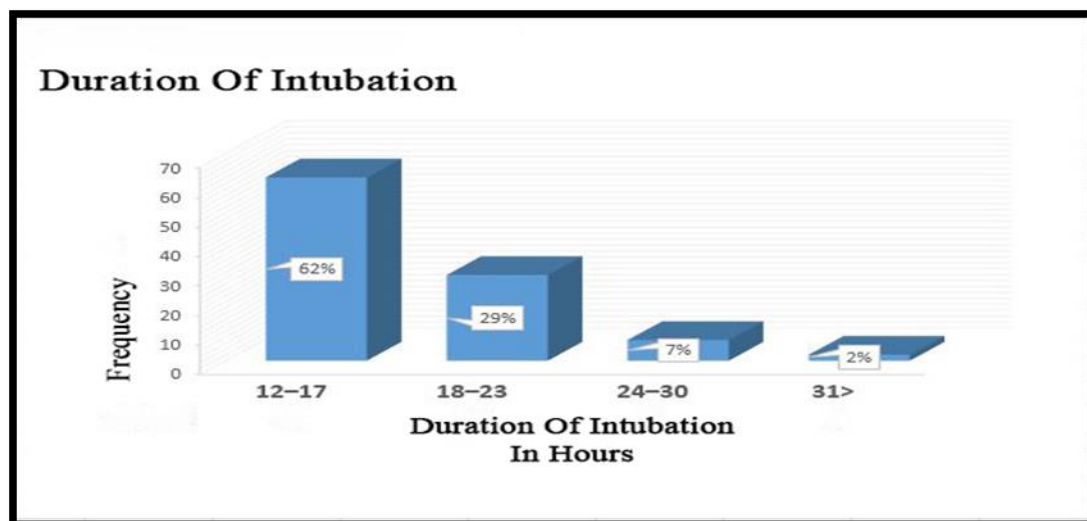

Figure -1- **Distribution of Cardiac Surgery Patients with Prolonged Mechanical Ventilation by their Duration of Intubation. N= 100**
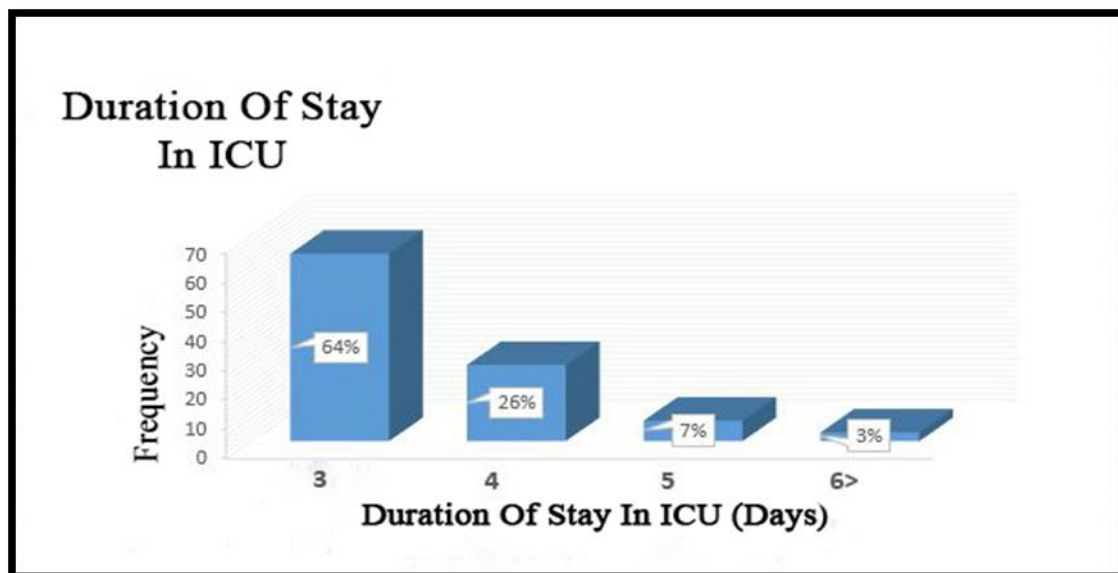This figure revealed show that the most of the duration of intubation are 12-17 hours (62%).

Figure -2- **Distribution of Cardiac Surgery Patients by their Duration of Stay in ICU. N= 100**
This figure revealed show that the most of the duration of stay in ICU are 3 days (64%).

Table 4: Association between Duration of Intubation and Preoperative Risk Factors among Cardiac Surgery Patients with Prolonged Mechanical Ventilation.

Duration Of Intubation				ANOVA test			
Age (years)	No.	%	Mean ± SD	CV	D.F	P	Sig
47-50	2	2	15.00 ± 1.414				
51-54	2	2	12.00 ± 0.000				
55-58	10	10	13.20 ± 1.229				
59-62	30	30	15.83 ± 3.659	7.091	99	.000	HS
63-66	22	22	15.45 ± 2.132				
67-70	18	18	15.78 ± 2.463				
71-74	12	12	18.75 ± 3.519				
75-78	4	4	23.25 ± 3.775				
Duration Of Intubation				**T test**			
Gender	No.	%	Mean ± SD	CV	D.F	P	Sig
Male	56	56	16.27 ± 4.020	2.615	98	.047	S
Female	44	44	19.84 ± 3.026				
	Duration Of Intubation			**ANOVA test**			
Body Mass Index	No.	%	Mean ± SD	CV	D.F	P	Sig
(< 18.5)	0	0	0.000 ± 0.000				
(18.5-24.9)	16	16	15.31 ± 2.358				
(25-29.9)	44	44	16.34 ± 3.672	.686	99	.562	NS
(30-39.9)	37	37	16.14 ± 3.750				
(> 40)	3	3	14.00 ± 2.000				
Duration Of Intubation				**T test**			
Creatinine Level	No.	%	Mean ± SD	CV	D.F	P	Sig
Normal	81	81	15.74 ±3.228	1.73	98	.087	NS
Elevated	19	19	17.26 ±4.306				
Duration Of Intubation				**T test**			
Ejection Fraction	No.	%	Mean ± SD	CV	D.F	P	Sig
(55-70) %	54	54	15.76 ± 3.174	.840	98	.403	NS
< 55 %	46	46	16.35 ± 3.831				
Duration Of Intubation				**T test**			
Cardiac Arrhythmia	No.	%	Mean ± SD	CV	D.F	P	Sig
Yes	16	16	15.25 ± 2.380	.976	98	.331	NS
No	84	84	16.17 ± 3.650				
Duration Of Intubation				**T test**			
Smoking	No.	%	Mean ± SD	CV	D.F	P	Sig
Yes	32	32	15.75 ± 4.016	.546	98	.584	NS
No	68	68	16.16 ± 3.230				

No = number, % = percentage, SD= stander deviation, Sig = significant, CV = Computed Value, P value ≥ 0.05, DF= degree of freedom, S = significant, NS = non-significant, HS = high significant, < = less than, > = more than.

This table show that a statistical high significant association between duration of intubation and age groups, in addition to significant association between duration of intubation and gender (P value ≥ 0.05), while there are no statistical association between duration of intubation and (Body Mass Index, Creatinine Level, Ejection Fraction, Cardiac Arrhythmia, Smoking).

DISCUSSION

The findings of the present study revealed that the past medical and surgical history for (100) patients Indicated that the (48%) of the sample were Diabetes Mellitus, majority (66%) of the patients have Hypertension; highest percentage (54%) is high cholesterol. This result is supported by (Herman, et al., 2009) who stated that the Hypertension (69.8%), Diabetes (45%) and Hypercholesterolemia (76.4%) for patients who underwent isolated CABG, and stay more than 72hrs in intensive care unit, The findings show (64%) of the patients have angina, (3%) of patents have Cerebrovascular accident, (Piotto, et al., 2012) supports this finding through his study who find (74%) were angina and (1.7) with Cerebrovascular accident when compare two groups of patient with prolonged mechanical ventilation first group stay ≤ 48h and second group stay more than 48h after coronary artery bypass surgery. Related to myocardial infraction, the findings shows that the (9%) of patients have myocardial infraction, (7%) of patients have renal diseases and (2%) of patients have previous cardiac surgery. (Reddy, et al., 2007) supports this findings through their study to identify independent risk factors for prolonged ventilation there are found that the (12.8)of the patients have myocardial infraction, (12.7) of patients have renal diseases and (5.1) have history for cardiac surgery. The result of preoperative risk factors for (100) patients Indicates that the (56%) of the sample are male and remaining are female. This result is similar to that obtained from (Shirzad, et al., 2010) in their study to determine the predictors of prolonged mechanical ventilation (PMV) in patients undergoing heart valve surgery there are found (52.9%) of patients with prolonged mechanical ventilation are male and (47.1%) of patients are female. (Knapik, et al., 2011) supports this finding through his study Prolonged ventilation post cardiac surgery who found that the male with Prolonged ventilation more than female. The finding shows that most of the study samples are at age between (59-62) years old and mean and standard deviation are (64.21±5.80). This result comes along with a study done by (Prapas, et al., 2007) which finds that the mean of age for patients with prolonged mechanical ventilation following aorta no-touch off-pump coronary artery bypass surgery are (64.85).Regarding to body mass index the results show that the highest percentage (44 %) of the patients are overweight and the lowest percentage (0%) underweight and the mean of body mass index for patients are (29.21), and the (32 %) of the patients were smoke. This findings supports with result obtain by (Lei, et al., 2009) who find that the mean of body mass index for patients are (27.21), and the (32.3 %) of the patients are smoke in their study to determine predictors of prolonged mechanical ventilation after aortic arch surgery. In related to the ejection fraction, the results show that the (54 %) of the patients have normal ejection fraction.(Trouillet, et al., 2011) support this finding through their study which state that the most of patients with prolonged mechanical ventilation were normal ejection fraction when he compare between tracheotomy and prolonged intubation of mechanically ventilated Patients after Cardiac Surgery. Concerning the creatinine level, the highest percentage (81%) is normal level. This result is supports by (Eltheni, et al., 2012) who find that the (82.7) of Prolonged Stay in the Intensive Care Unit following Cardiac Surgery is normal level of

creatinine. The results show (16 %) of the patients have cardiac arrhythmia, this finding is supported with the result found by (Augoustides, et al., 2008) which state that the (10.4%) of patient with prolonged mechanical ventilation after aortic arch repair have preoperative cardiac arrhythmia. This findings show that a statistical high significant association between age groups and duration of intubation, this result supported with (Widyastuti, et al., 2012) who show that the significant association between age and prolonged ventilation following adult cardiac surgery. There are statistical significant association between gender and duration of intubation (P value ≥ 0.05), (Forouzannia, et al., 2011) supports this finding through his study who stated that the significant association between gender and prolonged ventilation that leading to late ICU discharge after Off-Pump coronary artery bypass surgery.

CONCLUSIONS:

From the results we conclude that the age and sex most important preoperative risk factors that lead to increase duration of mechanical ventilation after cardiac surgery.

RECOMMENDATIONS:

Based "on the results of the current study, the researchers recommended to follow a Fast-track protocol for the purpose of patient care after cardiac surgery, especially in the process of weaning patient from mechanical ventilation device down to remove it.

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