Effect of Gender and Age on Fast Track Recovery after Coronary Artery Bypass Graft Surgery

Mehdi Dehghani Firoozabadi, Ahmad Ebadi, Mohammad Ebadi, Saeid Ebadi

Article history:
Received 14 November 2013
Received in revised form 24 December 2013
Accepted 28 December 2013
Available online 18 January 2014

Keywords:
CABG, Extubation Time, Age, Gender

ABSTRACT

Background: The extubation time after open heart surgery has been the subject of many scientific articles for more than a decade. Today, early extubation is a common phenomenon in CABG surgeries. The aim of the present study is to examine the correlation between the age and gender with extubation time after coronary artery surgery. Materials and Methods: this is a retrospective study, we referred to archive of Golestan hospitals, gathered files of patients with CAGB in 2013 and extracted required data from them. Data gathering instrument was researcher-constructed questionnaire including patients' demographic information. Results: According to statistical results, the extubation time in patients over 70 years was significantly higher than those under 70 years (P>0.05). 23% of male patients and 24% of female patients experienced delayed extubation. No statistically significant difference was found between the two groups (P>0.05). Conclusion: Extubation time in patients undergoing cardiac surgery increases with increasing age. But there is no difference between the two genders. However, this finding requires further research by other scholars.

INTRODUCTION

Coronary artery disease (CAD) is as a major public health problem in developed countries. The prevalence of coronary artery disease in developing countries including the East Mediterranean has been increased in recent years. Due to the importance of issue as well as the social and economic reasons, primary and secondary prevention measures should be considered. Despite a significant decline in mortality from coronary heart disease in America and Europe, the incidence of the disease in underdeveloped countries is increasing (Chen, J.H., 2006; Vaheidian Azimi, A., 2010). CAD is the most common form of cardiovascular disease with a prevalence of 6.9% and 6% in men and women, respectively.

CAD is one of the causes of death, illness and disability in the Iranian population. It includes approximately 50% of all deaths annually (World Health Organization, 2008). Today, it is the first cause of death in Iranian people over 38 years. The prevalence of deaths from heart disease in Iran is 28 to 48%. The prevalence of ischemic heart disease in Iran is high. Secondary prevention strategies include medical and surgical procedures with effective cardiac rehabilitation programs (Lopez-Jaramillo, P., 2001). After open heart surgery, patients are directly transferred to the intensive care unit (ICU) where they become out of the anesthesia. The aim of postoperative care is to maintain adequate mechanical ventilation, adequate oxygenation and hemodynamic stability. It is the responsibility of the nurses with special knowledge and skills in the management and care of such patients. Nurses working in ICU should be familiar with the type of surgery, postoperative instructions, advanced survey and problem-solving process, techniques and skills required in ICU including how to isolate the patient from mechanical ventilation and extubation of endotracheal tube or pulmonary artery catheters (Braunwald, E., 2001; Jacobs, J.P., 2013; McKendry, M., 2004; Rauen, C.A., 2004). Rapid recovery and discharge of patients from the intensive care unit, particularly the patients undergoing coronary artery surgery was first introduced by Crohn et al in 1990 in a study entitled “rapid recovery and
extubation of endotracheal tube within 1 to 6 h after the surgery and discharge of patient from the ICU within 24 h" (Van den Heede, K., 2009; Kaplan, M., 2002). According to previous studies, the endotracheal tube in patients with myocardial function can be extubated after coronary artery bypass grafting within 6 h in 90% of cases (Kehlet, H., D.W. Wilmore, 2008; El-Shobakia, A., 2002; Celkan, M.A., 2005). The extubation time after open heart surgery has been the subject of many scientific articles for more than a decade. Today, early extubation is a common phenomenon in CABG surgeries (Lena, P., 2005; Ferasatkish, R., 2008; Guller, U., 2004; Maddali, M.M., 2006). Revealing the positive results of early extubation, the factors related to extubation time or ways to achieve early extubation became the subject of many investigations. Some studies suggest the relationship between the age and female sex with prolonged intubation (Sato, M., 2009; Bulter, J., 1992). However, there are studies in which no correlation has been found between the age and gender with extubation time (Reyes, A., 1997). The aim of the present study is to examine the correlation between the age and gender with extubation time after coronary artery surgery.

**Methods:**

This study is a descriptive epidemiologic study. The statistical population included the patients who underwent CABG in Ahvaz Golestan Hospital. After obtaining approval from the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, the records of patients who had undergone cardiac surgery were collected. Then, the required information was obtained from the records. Data collection tool for this study was a researcher-made questionnaire, which includes both demographic data and variables studied. It should be noted that all patients received routine surgery as follows: the patients received 0.1 mg/kg of intramuscular morphine and 25 mg intramuscular promethazine on arrival to the operating room. The patients also received their common cardiac medication the day before surgery (except ACE-I and anti-platelet). They also received 1.5 g intravenous cefazolin every 8 hours for 24 hours, which is a prophylaxis antibiotic. Anesthetic medication began with 2-3 mg kg (3-5 mg) thiopental and atracurium and midazolam (0.1 mg/kg). CVP = central venous arterial line-NG tube-fully pressure and esophageal temperature probe were inserted for EKG patients. Then, they were monitored. In addition, circular membrane oxygenator pump was used. Prime solution with one-liter NORMAs molar Ringer’s solution and 500 ml glucose 5% solution and a vial of sodium bicarbonate and 100 cc of 18% mannitol were given to the patients before aortic clamping. The flow rate was adjusted, so that mean arterial pressure was maintained between 80-60 mmHg throughout the operation. Systolic, diastolic, mean arterial pressures, heart rate, central venous pressure (CVP), arterial oxygen pressure (PaO2), arterial PH and arterial oxygen saturation (SaO2) were measured and recorded in the previous stage, during connecting CPB, before entering the recovery and 2 hours after surgery. Blood pressure was measured in an aggression form. In addition, the pressure was measured using CVP. Arterial blood gases including PH, PaO2 and SaO2 were also measured. In the group with CPB, the patients were evaluated in terms of duration of pump connection. If the systolic blood pressure was less than 90 mmHg during CPB separation, 0.01-0.1 μg/kg/min inotrope medication was used, which is actually the dilute adrenaline. Additional ringer was prescribed in order to maintain the constant fluid level. Hemodilution was also done in order to maintain a minimum level of 7g/dl-Hg. Myocardial protection was done using intermittent backward and forward cardio hemoplegia with cold blood. At the end of surgery with CPB, the entire circuit was returned to the patient. After surgery, the patient was transferred to ICU in both intubated and sedated conditions in order to keep the patients in the sedation state. Then, propofol was prescribed before rewarming. If the hemodynamic stability, alertness and pain control were in normal conditions, the patient was removed from mechanical ventilation. The patient’s hemodynamic was managed as MAP> 65 using crystalloid and colloid dopamine infusion or epinephrine, if necessary. At the end, the data was entered into the computer and was analyzed using SPSS. Descriptive statistics was used to present the tables and graphs. Moreover, analytical statistics such as chi-square was used in order to compare the conditions in terms of two different sexes and various ages.

**Results:**

Of 100 patients examined in this study, 50 were females and 50 were males. The mean weight, height and age of male and female patients were not significantly different (P> 0.05). The total duration of pump in female and male patients was 87 and 90 minutes, respectively which were not statistically different(P>0.05). The mean EF of female and male patients was 43% and 47%, respectively which were not statistically different(P>0.05). The mean age of patients was 61.12+ 8.11 years. Of this, 35% aged over 70 years and 65% were below 70 years. According to statistical results, the extubation time in patients over 70 years was significantly higher than those under 70 years (P>0.05). 23% of male patients and 24% of female patients experienced delayed extubation. No statistically significant difference was found between the two groups (P>0.05).

**Discussion:**

The early extubation of endotracheal tube in the ICU reduces restlessness and pulmonary atelectasis while improving respiratory muscle strength and cardiac and renal perfusion through removing breathing with positive
airway pressure and positive end expiratory pressure. Second, the early walking will reduce venous thrombosis and pulmonary embolism. Third, reduced length of stay in the ICU will reduce medical costs. The results showed a direct correlation between the age and extubation time. But there was no significant difference in terms of gender. Similar results can be found in previous studies. Goodwin et al studied patients with open heart surgery. According to Goodwin et al, the relationship between the age and prolonged intubation is probably due to factors such as the tendency of elderly patients for diaphragmatic breathing, decreased muscle strength and rigidity and hardness of lung. In addition, increased heart rate and blood pressure in elderly patients makes the early extubation difficult (Ingensoll, G., M. Grippi, 1991). Imanipour et al studied the relationship between coronary artery bypass preoperative variables with extubation time. According to Imanipour et al, the mean and standard deviation for the total duration of intubation was 7.19 ± 3.00 with a time range of 3 to 18.25 h. The extubation time in 43% and 57% of cases was less and more than 6 h, respectively. In patients with extubation time of 6 h, only age showed a statistically significant correlation with extubation time (P = 0.01). Accordingly, age is among the variables related to duration of intubation in patients undergoing CABG surgery. This means that elderly patients often experience longer duration of mechanical ventilation (Goodwin, M.J., 1999). Sabzevari et al investigated the relationship between individual and preoperative physiological variables with extubation of endotracheal tube after coronary artery bypass surgery. The results showed that the extubation time of less than or equal to 12 h in younger patients (<50 years) was significantly higher. The results of Mann-Whitney test confirmed the relationship between extubation time and history of balloon pump use (P<0.01) (Imanipour, Masoomeh, 2008). Extubation time was longer in those who used balloon pump. Accordingly, elderly patients and those who have used balloon pump need more attention than other patients. The early extubation of endotracheal tube will facilitate faster transfer of patient to the public ward and subsequent discharge from the hospital. It also reduces the medical costs. However, the other factors involved in extubation time were not examined in this study. Therefore, it is recommended to investigate these factor in future research.

**Conclusion:**

Extubation time in patients undergoing cardiac surgery increases with increasing age. But there is no difference between the two genders. However, this finding requires further research by other scholars.

**ACKNOWLEDGEMENT**

Authors Acknowledge the support by Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran

**REFERENCES**


Fletcher, G., K. Oken, R. Safford, Comprehensive Rehabilitation of Patients with Coronary Artery Disease. In.


