American Journal of Biomedical Science & Research

www.biomedgrid.com

ISSN: 2642-1747

Original Research Article

The Effect of Optimizing Pre-Hospital First Aid Process on the Efficacy of Rescue and Treatment for Patients with Acute Coronary Syndrome

Liu Zhen*, Qi Xing*, Qi Chunmei#, Zhang Xin, Ma Qing, Lu Ya Nan, Qiao Wei, Ma Yong and Chen Lu

The Second Affiliated Hospital of Xuzhou Medical University, China

*** Co-First author:** Liu Zhen and Qi Xing

#Corresponding author: Qi Chunmei, The Second Affiliated Hospital of Xuzhou Medical University, Xuzhou Meijian Road 32, Jiangsu Province, China.

To Cite This Article: Qi Chunmei. *The Effect of Optimizing Pre-Hospital First Aid Process on the Efficacy of Rescue and Treatment for Patients with Acute Coronary Syndrome. Am J Biomed Sci & Res. 2019 - 5(2). AJBSR.MS.ID.000899. DOI:* 10.34297/AJBSR.2019.05.000899.

Received: September 09, 2019; **Published:** September 17, 2019

Abstract

Objective: To explore the effect of optimizing pre-hospital first aid procession the rescue efficacy of patients with acute coronary syndrome (ACS) in the construction of chest pain center in general hospital.

Methods: A total of 214 patients with ACS admitted to our hospital from 2017 to December 2018 were selected (45 before the establishment of chest pain center and 132 after the establishment of chest pain center). To observe the effect of optimizing pre-hospital first aid process on shortening the time from entry to first balloon dilatation (D-to-B) and from first medical contact to first balloon dilatation (FMC-to-B) of ACS patients and improving the prognosis of STEMI patients.

Results: Compared with the operation of chest pain center, D-to-B time (41.82+4.23 vs 90.09+5.26; P >0.05) and FMC-to-B time (81.91 +4.43 vs 143.33 +3.54; P>0.05) were significantly shortened; the incidence of cardiovascular events was significantly reduced (P>0.05), and hospitalization days were significantly shortened.

Conclusion: In the pre-hospital first aid process, it is of great significance to optimize 120 departure process, pre-hospital ECG transmission process, referral and reception process improvement in the construction of chest pain center in general hospitals.

Keywords: Pre-Hospital First Aid; Acute Coronary Syndrome; Chest Pain Center; Process

Introduction

The incidence of acute coronary syndrome (ACS) in China is increasing year by year, but the overall level of treatment is still unsatisfactory. In view of the current situation in China, in order to reduce the risk of ACS, and accurately screen out low-risk patients with pulmonary embolism, aortic dissection and acute myocardial infarction, so as to reduce misdiagnosis, missed diagnosis and overtreatment, and improve patients, The establishment of chest pain center is one of the effective means to improve the treatment level of ACS. Since most hospitals in China are general hospitals, the practice of the diagnosis and treatment of acute coronary syndrome (ACS) and the construction of chest pain center in general hospitals is more representative [1]. Improving the diagnosis and treatment system of ACS in general hospitals and improving the process of chest pain centers are also more significant for promotion and guidance

Data Method

The Chest Pain Center of the General Hospital of Xuzhou Mining Group and the Second Affiliated Hospital of Xuzhou medical university was established in 2014. The Chest Pain Center was established in accordance with the standards of the Chinese Chest Pain Center. The director-in-charge system under the guidance of the leading group of the hospital was established. The technical director and the administrative director were responsible for the professional operation and administrative management of the center, respectively. Wu includes Emergency Department, Cardiovascular Internal Care Unit, Catheter Room, Cardiac Surgery, Respiratory Department, Imaging Department, Laboratory Department and External Liaison Department. December 2014 became the third batch of certified qualified units of China Chest Pain Center.

Patients Selected

A total of 214 ACS patients admitted to our hospital from 2013 and 2018 were selected (45 before the construction of chest pain center in 2013 and 132 after the establishment of chest pain center in 2018). ACS patients were defined as those with abnormal ECG or myocardial enzymes within 12 hours of acute chest pain, and all of them underwent coronary intervention.

Process Improvement

According to the analysis of the joint regular meeting of the chest pain center, the Committee of the chest pain center constantly formulates and revises the pre-hospital first aid process, especially optimizes the 120 out-of-car and pre-hospital ECG transmission process, referral and reception process improvement. The process improvement highlights the responsibilities of pre-hospital emergency personnel, requiring pre-hospital emergency medical personnel to optimize the 120 out-of-car process, pre-hospital ECG transmission process, complete ECG collection within 10 minutes, and transmit it to the mobile phone on duty in the Chest Pain Center of Xuzhou Mining Group General Hospital, so as to reduce it as quickly as possible. The occurrence of pre-hospital delay.

Observation Indicators

To observe the changes of each time point during the treatment of chest pain center, the time of first medical contact with electrocardiogram, the time of first medical contact with physician's interpretation of electrocardiogram, the time of door-enzyme, that is, the time from entry to biochemical markers, especially to observe and optimize the pre-hospital first aid process to shorten the D-to of ACS patients. B time, FMC-to-B time, transmission electrocardiogram ratio, ratio of bypass to emergency room, length of hospitalization and incidence of cardiovascular events were observed to observe the effect of process improvement on the prognosis of ACS patients.

Results

The number of patients with acute coronary syndrome increased by 65.9% in 2018 compared with before the construction of chest pain center in 2013. The D-to-B time was significantly shortened after the construction of chest pain center in 2018. The D-to-B time was(41.82+4.23 vs 90.09+5.26; P>0.05), FM-to-B time (81.91 +4.43 vs 143.33+3.54; P> 0.05; first contact to the first ECG time 8.56+2.76 vs 15.83+3.56 points (P>0.05); gate enzyme time 20.71+5.12 vs 37.41+3.21 points (P>0.05); transmission electrocardiogram ratio increased from 0 in 2018 to 46.8% of patients selected in 2018, and bypass emergency treatment. The proportion of rooms increased to 24.3%. The average length of hospitalization was reduced from 11.04 to 4.54 days, and the incidence of cardiovascular events was reduced by 38%.

Discussions

The concept of chest pain center originated in the United States. The first "chest pain center" was established in 1981 at St. ANGLE Hospital in Baltimore, USA. At present, the number of "chest pain centers" in the United States has reached more than 5,000. In a narrow sense, the main purpose of establishing chest pain centers can be summarized in 16 words: "rapid diagnosis [2], timely treatment, reduction of death and avoidance of waste". At present, the chest pain centers in our hospital have been running for more than 4 year. Because of the establishment of green channels, and the fact that the main class and reserve Doctor of Emergency Surgery in the Department mostly live near the hospital, so the total starting time of catheter room is about 30 minutes, and the D-to-B time is basically less than 90 minutes. In order to (Better)save patients 'lives and make rapid diagnosis, more work should focus on the improvement of pre-hospital first aid process and shorten the pre-hospital delay to the maximum extent. Therefore, the center mainly carries out pre-hospital staff training, continuously improves the pre-hospital process, accurately records each time node and key indicators and constantly shorten the treatment time, reduce the occurrence of cardiovascular events.

Formulation and Improvement of Pre-Hospital Process

Continuous improvement is the essence of the work of the Chest Pain Center of Xuzhou Mining Group General Hospital. The management organization of the Chest Pain Center constantly summarizes and collates the data and implements the corresponding process improvement plan. In order to reduce the uncertainty and randomness in the ACS treatment process, PDCA management method was applied to develop and improve the process. The goal of process formulation is to shorten the critical time nodes in the process of ACS first aid, to implement various measures to shorten the time of ACS first aid smoothly, and to adopt the corresponding assessment mechanism and incentive mechanism. The characteristics of general hospitals are still the traditional treatment methods, which is mainly manifested in the low proportion of ECG transmission before hospital, the insufficient proportion of bypassing emergency room, which leads(leading) to delayed treatment of ACS and doctors in our hospital cannot diagnose ACS in the first time. There are many similarities between our hospital and other general hospitals. As many as 70% of primary hospitals refer emergency PCI patients. Therefore, training doctors in grass-roots hospitals, transmitting electrocardiogram at the first time, shortening the start-up time of catheter room, and increasing the number of patients in bypass catheter room can improve the treatment level of patients and shorten the pre-hospital start-up delay [3].

The process improvement of our hospital has the following characteristics:

1. Emphasis is laid on the pre-hospital transmission of electrocardiogram by pre-hospital emergency personnel, the specific operation and responsibility of pre-hospital transmission of electrocardiogram to people, through mobile phone transmission, the electrocardiogram can be taken through mobile phone MMS, Wechat (18652153219) and QQ (1341954020) form to occur on

the mobile phone of our center (1865215). 3219), the main class after receiving, if confirmed as STEMI after a key start.

2. Pre-hospital personnel began to use drugs in ambulances to shorten the medication time.

3. Pre-hospital emergency personnel have the authority to start the catheter room and communicate with patients on the ambulance about the operation, to shorten the talk time after reaching the hospital.

4. For patients who disagree with the operation and are about to miss the opportunity of operation, local thrombolysis can shorten the reperfusion time.

5. Cardiologists on duty can enter the catheter room directly according to the results of electrocardiogram and the communication between pre-hospital emergency personnel and patients, bypass the emergency room, greatly shorten the treatment time and reduce the occurrence of cardiovascular events.

According to our experience, if the catheter room can be activated from the ambulance, the scheme of bypassing the emergency department and CCU can further shorten the treatment time.

6.2. Training and Drilling of Pre-Hospital Emergency Personnel

Because most ACS patients in our country first visit primary hospitals with limited conditions, this determines the importance of primary hospitals in shortening the reperfusion time of STEMI patients [4]. If primary hospitals can't transfer patients to qualified hospitals for PCI treatment in a short time, they should not overemphasize the advantages of PCI so that delay the time of reperfusion. In this case, thrombolytic therapy should be carried out first, infarct-related blood vessels should be opened as soon as possible, and myocardial perfusion recovery is undoubtedly feasible way to maximize the protection of viable myocardium. However, whether thrombolysis is successful or not, patients should be transported to higher hospitals for PCI treatment as quickly and safely as possible after thrombolysis, to truly play an important role in STEMI treatment in primary hospitals. Therefore, primary hospitals must constantly be familiar with improving the ACS treatment and referral process [5].

In order to shorten the time of pre-hospital first aid, the center continuously enters the grass-roots hospitals for training and drilling.

Develop a practical training program for STEMI patients 'treatment process:

1. Define the purpose of the exercise:

In order to better treat ACS patients, shorten the time of opening occluded blood vessels for STEMI patients, and maximize the myocardial salvage, this emergency treatment drill plan is formulated by the center of cardiology, together with the relevant departments such as mining general hospital first aid station, doctors of primary hospitals, emergency departments, laboratories, catheter rooms, imaging departments, respiratory departments, thoracic surgery , service center and other departments of the United City 120 Emergency Center.

2. Establish appropriate drilling time.

3. Aiming at the continuous drilling of the first aid station in the primary hospital and the general Mine Hospital of 120 emergency centers in the city, the organization of the drill was established. In order to ensure the effectiveness of the drill and grasp the various links of the drill, a leadership group of the emergency treatment drill program for STEMI patients was set up to take charge of the organization and leadership of the whole drill and the effect inspection.

4. Preparation for drill:

a. Organize the meeting of the members of each department, read out the drill plan, put forward the drill requirements, and clarify the necessity and basic steps and procedures of the drill.

b. Explain the significance of establishing chest pain center before exercise, the importance of emergency treatment exercise of STEMI patient treatment process, familiarize members with the treatment operation process, explain the procedure, content and time requirements of the exercise, in order to shorten the operation time of the process to the greatest extent.

c. Verify the operability of the emergency plan and make it further improved.

5. Event Presupposition: A patient with acute chest pain for 3 hours developed in a grass-roots hospital. The patient was 58 years old, healthy and slightly obese at ordinary times. Upper abdominal discomfort occurred after taking part in heavy physical work. Paroxysmal pain lasted for 3 hours and aggravated, accompanied by sweating and a sense of near-death. Colleagues suffered from serious diseases, the unit calls 120 emergency center, 120 ambulances will send patients to our hospital.

6. Exercise steps:

a. The dispatcher receives the alarm, inquires and dispatches.

b. Pre-hospital emergency personnel preparation and departure.

c. Disposal after arrival at the scene.

d. Treatment and communication during transit.

e. Implement seamless connection after arriving at the hospital.

f. Emergency Department completes myocardial enzymes examination, communication, one key start.

7. Summary of the drill: After the drill, the leadership team of the emergency drill and the heads of departments gathered on the spot to attend the summary meeting of the drill.

In short, the Chest Pain Center is a concept for reducing the morbidity and mortality of acute myocardial infarction [6]. Through multidisciplinary cooperation (including Emergency Medical System (EMS), Emergency Department, Cardiology and Imaging), it provides rapid and accurate diagnosis, risk assessment and appropriate treatment. Therefore, in order to improve the treatment course of patients with chest pain simplification and optimization of the process of diagnosis and treatment simplify and optimize the treatment process, in all hospitals, especially in general hospitals at the grass-roots level, the chest pain center only pays attention to every link from the onset to the opening of infarction-related blood vessels. Extending the first aid service from optimizing the process of in-hospital treatment to pre-hospital first aid and transshipment will be the lessons faced by major PCI centers question. In the construction of chest pain center, continuous improvement of pre-hospital first aid process is carried out to classify and treat patients with chest pain effectively, so as to improve the ability of early diagnosis and treatment of ACS [7], reduce the possibility of occurrence of myocardial infarction or avoid occurrence of myocardial infarction, accurately screen out low-risk patients with myocardial ischemia, to reduce misdiagnosis and missed diagnosis, and The aim of overtreatment and improvement of clinical prognosis of patients.

Funding

Xuzhou Health and Health Committee with grant number (KC19179).

References

1. Li Jun, Feng Tianbao, Liu Hongying, Wen Zhijun (2019) Effect of Chest Pain Center Construction on the Efficiency of Emergency PCI Diagnosis for Acute ST-segment Elevation Myocardial Infarction. Electronic Journal of Clinical Medicine Literature (41).
2. Zhang Wenkai, Li Changluo, Dingning (2018) Effect of Chest Pain Center on Emergency Interventional Therapy for ST-segment Elevation Myocardial Infarction and Its Clinical Value. Journal of Hubei Medical College (06).
3. Wang Zuolan, Feng Nana, Che Jingjin (2018) The effect of establishment of chest pain center on the treatment of acute ST-segment elevation myocardial infarction. Tianjin Medicine (04).
4. Ou Geyu Shenzhen (2018) Effect of Green Channel in Chest Pain Center on the Treatment of Acute ST Segment Elevation Myocardial Infarction. Journal of Integrated Traditional Chinese and Western Medicine (14).
5. Luo Zhigang (2018) Analysis of difference in treatment effect of acute ST-segment elevation myocardial infarction before and after the establishment of chest pain center. Chinese Medical Science (09).
6. Scholz KH, Maier SKG, Maier LS, Lengenfelder B, Jacobshagen C, et al. (2018) Impact of treatment delay on mortality in ST-segment elevation myocardial infarction (STEMI)patients presenting with and without hemodynamic instability: results from the German prospective, multicenter FITT-STEMI trial. Eur Heart J 39(13): 1065-1074.
7. Al-Zaiti S, Sejdic, Nemec J, Callaway C, Soman P, et al. (2018) Spatial indices of repolarization correlate with non-ST elevation myocardial ischemia in patients with chest pain. Med Biol Eng Comput 56(1): 1-12.