Nurses’ Knowledge, Attitude and Practice regarding Myocardial Infraction Patients’ Care, Cardiac Surgery and Renal Transplantation Center, at Ahmed Gasim Hospital, Khartoum State, Sudan (2013)

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Date: December 23, 2013
Nurses’ Knowledge, Attitude and Practice regarding Myocardial Infraction Patients’ Care, Cardiac Surgery and Renal Transplantation Center, at Ahmed Gasim Hospital, Khartoum State, Sudan (2013)

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Date of examination: 23, December, 2013
الآية

بسم الله الرحمن الرحيم

قال تعالى:

في قُلوبِهِمْ مَرَضٌ فَزَادَهُمْ اللهُ مَرَضًا

سورة البقرة، الآية 9
Dedication

To my best loved my parents, My Brothers and My Sisters Who gave all their best and supported me in all my decisions

To my wife who gave all to make me the Person,

Finely to my supervisors, and to my best Friend, to my Kids.
Acknowledgement

I extremely appreciate the effort and guidance of my supervisor: Dr. Bothyna Bassyunie Essayed and Co-supervisor Dr: Ietimad Ibrahim Abd-Elrhman Kambal for their helpful advices and valuable suggestions to me at the various stages of the research and heir ultimate consultation. To my family how permanently support me during my life Study my thanks owed to staffe of faculty of applied medical sciences university of Gezira. To my colleagues in Ahmed Gasim Hospital Cardiac Surgery and Renal Transplantation Center.
Nurses’ Knowledge, Attitude and Practice regarding Myocardial Infraction Patients’ Care, Cardiac Surgery and Renal Transplantation Center, at Ahmed Gasim Hospital, Khartoum State, Sudan

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Abstract

Myocardial infraction is the most common cause of death, so that patients in the cardiac unit or intensive care unit (ICU) are at risk for dying and re-infraction and need proper nursing care, which considered a high importance for keeping normal life. A descriptive hospital based study was conducted aimed at assessing nurses’ knowledge, attitude and Practices regarding myocardial infraction Patients Care in Ahmed Gasim Hospital, Cardiac Surgery and renal transplantation Center, Khartoum State, Sudan (2013). The sample size consisted of (65) cardiac nurses in cardiac unites and intensive care unit during the period from may 2012 to October 2013. Data was collected by using a questionnaire designed for the study and observation check list was used to observe nurses in caring for myocardial infraction patients care. Data analysis was performed by using statistical package for social sciences (SPSS). The results revealed that (69.9%) of the study sample responded with correct answers regarding definitions of myocardial infraction. (78.8%) of the study sample responded with correct answers regarding diagnosis of myocardial infraction , while (64.5%) of them know management of myocardial infraction and (67.8%) of them responded correctly regarding care of patient with anxiety and fear from death .(61.5%) , (30.7 % )&( 66.2% ) of them had correct answers regarding risk factors , diet ,and prevented of risk respectively. (67.8%) of them agreed about the nurses can contribute in diognoses of myocardial infraction. (41.5%), & (47.7%) of the study sample perform Psychological support of myocardial infraction patients and assess abnormal breath sound and report regarding myocardial infraction patients care respectively. The study concluded that the nurses’ knowledge regarding myocardial infraction patients care were inadequate. The study recommended that nurses’ needs continued training about nursing care of patients with myocardial infraction and continues motoring and supervision for nurses performance as method of quality assurance .
ملخص الدراسة
تعتبر الاضطرابات القلبية من أكثر الأمراض سبعا للوفاة لأن المرضى في قسم القلب أو العناية السريرية يكونون عرضة لخطر الوفاة، فعليه تناول المرضى للرعاية التمريضية اللازمة التي تعتبر ذات أهمية عالية لحفظ حيويتهم الطبيعية. أجريت هذه الدراسة الوصفية بمستشفى أحمد قاسم مركز جراحة القلب وزراعة الكلى بخدمات كلي الستحو القلبي بولاية الخرطوم- السودان (2013). أشكلت الدراسة عينة على (65) مريض، وجرى تقسيمهم إلى مجموعتين، لناجحة وناجحة، في الفترة من مايو 2012 وحتى أكتوبر 2013. تم جمع البيانات باستخدام استبيانات مصممة لاجل الدراسة وتم قراءة ملاحظة ملاحظات ممارسات الممرضين والممرضات في العناية بمرض الاضطراب القلبي.

التحليل بواسطة استخدام برنامج الجملة الإحصائية للعلوم الاجتماعية (SPSS). أظهرت النتائج أن (69.9%) من عينة الدراسة كانت إجابات صحيحة عن تعريف النوبة القلبية، و (78.8%) من عينة الدراسة أجابوا إجابات صحيحة عن تشخيص النوبة القلبية، (64.5%) منهم فقط يعانون علاج النوبة القلبية، و (67.8%) من أفراد العينة كانت إجاباتهم صحيحة عن الرعاية التمريضية لمريض القلب والوفاة من الموت، وكان (30.7%) و (61.5%) على التوالي كانت معرفتهم صحيحة بعوامل الخطورة، وقابلية الموت، وتعافي شخصيات، و (67.8%) من أفراد العينة توافق على إن الممرضين والممرضات يمكن أن تسهم وتشترك في تشخيص النوبة القلبية، و (41.5%) من أفراد العينة على التوالي قاموا بتقديم الدعم النفسي لمريض النوبة القلبية، وتقييم النفس، وتسجيله، و (47.7%) من أفراد العينة على التوالي قاموا بتقديم الدعم النفسي لمريض النوبة القلبية، وتقييم النفس، وتسجيله.

خلصت الدراسة إلى أن المعرفة بالممرضين وبعض العناية بمرض النوبة القلبية، وملاحظة عمل الممرضين والممرضات لضبط الجودة.

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# Abbreviations

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<td>CVD</td>
<td>Cardiovascular diseases</td>
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<td>AMI</td>
<td>Acute myocardial infarction</td>
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<td>MI</td>
<td>Myocardial infarction</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>IHD</td>
<td>Ischemic Heart Disease</td>
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<td>PT</td>
<td>Patient</td>
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<td>DM</td>
<td>Diabetes Mellitus.</td>
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<td>ECG</td>
<td>Electrocardiogram</td>
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<td>PCI</td>
<td>Percutaneous coronary intervention</td>
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<td>HDL</td>
<td>high density lipoprotein</td>
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<td>STEMI</td>
<td>ST elevation myocardial infarction</td>
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<tr>
<td>LDL</td>
<td>low-density lipoprotein</td>
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<tr>
<td>BP</td>
<td>blood pressure</td>
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<tr>
<td>CVA</td>
<td>Cerebrovascular accident</td>
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<tr>
<td>UA</td>
<td>unstable angina</td>
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<tr>
<td>EMS</td>
<td>Emergency Medical Services</td>
</tr>
<tr>
<td>U. K</td>
<td>University of Khartoum</td>
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<td>NCP</td>
<td>Nursing care plan</td>
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<td>IV</td>
<td>Intra venous</td>
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<td>CCU</td>
<td>Coronary cardiac unit</td>
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<td>US</td>
<td>United state</td>
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<td>HE</td>
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CHAPTER 1
1. Introduction

1.1 Background

Cardiovascular diseases (CVD) and acute myocardial infarction (AMI) remain one of the main causes of death in the world, accounting for almost one third of all deaths worldwide (Mallison T, 2010). And about half of all deaths in Europe (Kosuge; M et al, 2006). Cardiovascular diseases consist of heterogeneous groups of vascular diseases, with atherosclerotic vascular diseases being the commonest group. Although the risk factors of atherosclerotic vascular diseases include several risk factors such as abnormal lipids, hypertension, smoking and diabetes (Erhardt; et al, 2002), a substantial proportion of cardiovascular events cannot be attributed to any of the risk factors (Robert Bet; al, 2004). Myocardial infarction (MI) or acute myocardial infarction (AMI), commonly known as a heart attack, is the interruption of blood supply to part of the heart, causing heart cells to die. This is most commonly due to occlusion (blockage) of a coronary artery following the rupture of a vulnerable atherosclerotic plaque, which is an unstable collection of lipids (fatty acids) and white blood cells (especially macrophages) in the wall of an artery. The resulting ischemia (restriction in blood supply) and oxygen shortage, if left untreated for a sufficient period of time, can cause damage or death. 12.5 million of the estimated 32 million worldwide heart attacks are fatal (Integrated Management of Cardiovascular Risk, WHO, 2002), 40-75% of all victims die before reaching hospital and 24% of men die within a year of a heart attack in the US (The National hospital (Integrated Management of Cardiovascular Risk, WHO, 2002), 42% of women (Women’s Health Information Center, CDC). Deaths from Heart attack: 459,841 deaths in 1998 (NHLBI); 199,154 deaths for AMI reported in USA 1999 (NVSR Sep 2001). More than 250,000 die before they reach hospital (The British Heart Foundation, 2004). 50% wait more than 2 hours before getting help (The British Heart Foundation, 2004). The causes of Heart attack: 49% of cases caused by high blood pressure worldwide (WHO, 2002) 3.3% of diabetic adults attending specialist diabetes services had a heart attack in Australia 2002.

Risk factors: The risk factors The World Health Organization (WHO) recently reported that the percent contribution of the classical CAD risk factors to the overall burden of disease in developing countries was as follows: smoking (12%),
hypertension (9%), obesity (7%), diabetes, and dyslipidemia (7%). Together, these risk factors accounted for 75% of the cardiac disease burden, implying that 75% of patients with cardiac disease have at least one of these risk factors (Australia’s Health; 2004).

1.2 Problem statement:

Myocardial infarction is a common presentation of ischemic heart disease. The WHO estimated in 2002, that 12.6 percent of worldwide deaths were from IHD with it the leading cause of death in developed countries, and third to AIDS and lower respiratory infection in developing countries. Worldwide more than 3 million people have STEMIIs and 4 million have NSTEMIs a year. (Integrated Management of Cardiovascular Risk, WHO, 2002) , 40-75% of all victims die before reaching hospital (Integrated Management of Cardiovascular Risk, WHO, 2002) , 42% of women and 24% of men die within a year of a heart attack in the US (The National Women’s Health Information Center) More than 250,000 die before they reach hospital, 50% wait more than 2 hours before getting help (The British Heart Foundation, 2004). The causes of Heart attack: 49% of cases caused by worldwide (WHO World Health Report, 2002) 3.3% of diabetic adults attending specialist diabetes services had a heart attack in Australia 2002 (Australia’s Health 2004, AIHW).

Developing countries bear a major share of the global burden of cardiovascular disease and acute myocardial infarction (AMI) remains one of the leading causes of death in these countries. Data on the management and outcome of AMI patients in developing countries is limited and is mostly derived from small one-site studies rather than large registries. Nevertheless, in general there seems to be a high prevalence of the classical CAD risk factors in AMI patients in most of these countries. In Sudan incidence of ventricular arrhythmias, brady-arrhythmias and sudden cardiac death following acute myocardial infarction were significantly high. The increased incidence is even in all age groups. DM, aAcute Myocardial infarction (MI) is one of the leading causes of mortality and morbidity (Beaglehole et al 2004).

Study in Sudan outlines the patterns of mortality among patients admitted to Police Central Hospital, Khartoum, Sudan, in the period January 1996 to December 1998. During the study period 67 patients died, from a total of 707 hospital deaths, with a mean age at death of 55.75±17.42 years years. One of major causes of death is myocardial infarction constitute (10%) , 2000 John Wiley
1.3 Justification and Rationale:

Incidence of ventricular arrhythmias, brady-arrhythmias and sudden cardiac death following acute myocardial infarction were significantly high in Sudanese patients. The increased incidence is even in all age groups. DM, smoking and past history of IHD are the commonest associated risk factors. Acute Myocardial infarction (MI) is one of the leading causes of mortality and morbidity (Erhardt L, et al 2002).

The (WHO) recently reported that the percent contribution of the classical CAD risk factors to the overall burden of disease in developing countries was as follows: smoking (12%), hypertension (9%), obesity (7%), diabetes, and dyslipidemia (7%). Together, these risk factors accounted for 75% of the cardiac disease burden, implying that 75% of patients with cardiac disease have at least one of these risk factors. Socioeconomic factors such as a shorter education and lower income (particularly in women), and unmarried cohabitation may also contribute to the risk of MI. To understand epidemiological study results, it's important to note that many factors associated with MI mediate their risk via other factors. For example, the effect of education is partially based on its effect on income and marital status (Warren-cash C; et al, 2009).

Many of these risk factors are modifiable, so many heart attacks can be prevented by maintaining a healthier lifestyle. Physical activity, for example, is associated with a lower risk profile (Spahr A. et al, 2006). Early heart attack (before the age of 60), which is thought of as reflecting a genetic predisposition (Khader; Yet al, 2003).

Thus, a primary objective of this study to assess the knowledge and practice of nurses regarding myocardial infarction and its management.
1.4 Objectives:

1.4.1 General Objective:
Assessment of Nurses' Knowledge, Attitudes and Practices regarding Myocardial infarction patients’ care in Ahmed Gasim Hospital Cardiac Surgery and Renal Transplantation Center Khartoum State, during May 2012 to November 2013

1.4.2 Specific Objectives:
- To identify the nurses' knowledge about Myocardial infarction.
- To monitor the nurses' performance about nursing care of Myocardial infarction patients.
- To assess their attitudes of nurses practices regarding Myocardial infarction.
CHAPTER 2
Literature Review

2.1 Definition

Myocardial infarction (MI) or acute myocardial infarction (AMI), commonly known as a heart attack, is the interruption of blood supply to part of the heart, causing heart cells to die. This is most commonly due to occlusion (blockage) of a coronary artery following the rupture of a vulnerable atherosclerotic plaque, which is an unstable collection of lipids (fatty acids) and white blood cells (especially macrophages) in the wall of an artery. The resulting ischemia (restriction in blood supply) and oxygen shortage, if left untreated for a sufficient period of time, can cause damage or death (infarction) of heart muscle tissue (myocardium).

Classical symptoms of acute myocardial infarction include sudden chest pain (typically radiating to the left arm or left side of the neck), shortness of breath, nausea, vomiting, palpitations, sweating, and anxiety (often described as a sense of impending doom (Malli, 2010)).

Women may experience fewer typical symptoms than men, most commonly shortness of breath, weakness, a feeling of indigestion, and fatigue (Kosuge, M; et al, 2006).

Approximately one quarter of all myocardial infarctions are silent, without chest pain or other symptoms. Among the diagnostic tests available to detect heart muscle damage are an electrocardiogram (ECG), chest X-ray, and various blood tests. The most often used markers are the creatine kinase-MB (CK-MB) fraction and the troponin levels. Immediate treatment for suspected acute myocardial infarction includes oxygen, aspirin, and sublingual nitroglycerin. If further pain relief is needed, morphine sulfate should be avoided. Recent research has shown that morphine actually increases mortality in acute coronary syndromes.

A 2009 review about the use of high flow oxygen for treating myocardial infarction found high flow oxygen administration increased mortality and infarct size, calling into question the recommendation for its routine use (Robert, B; et al, 2004).

Most cases of STEMI are treated with thrombolysis or percutaneous coronary intervention (PCI). NSTEMI should be managed with medication, although PCI is often performed during hospital admission. In people who have multiple blockages and who are relatively stable, or in a few emergency cases, bypass surgery maybe an option.
Heart attacks are the leading cause of death for both men and women worldwide (Bax L, et al 2008).

Important risk factors are previous cardiovascular disease, older age, tobacco smoking, high blood levels of certain lipids (triglycerides, low-density lipoprotein) and low levels of high density lipoprotein (HDL), diabetes, high blood pressure, obesity, chronic kidney disease, heart failure, excessive alcohol consumption, the abuse of certain drugs (such as cocaine and methamphetamine), and chronic high stress levels (Reznik; A, 2010).

2.2 Classification
There are two basic types of acute myocardial infarction:
Transmural: associated with atherosclerosis involving major coronary artery. It can be subclassified into anterior, posterior, or inferior. Transmural infarcts extend through the whole thickness of the heart muscle and are usually a result of complete occlusion of the area's blood supply. (Moe K, 2010).
Subendocardial: involving a small area in the subendocardial wall of the left ventricle, ventricular septum, or papillary muscles. Subendocardial infarcts are thought to be a result of locally decreased blood supply, possibly from a narrowing of the coronary arteries. The subendocardial area is farthest from the heart's blood supply and is more susceptible to this type of pathology.[8] Clinically, a myocardial infarction can be further subclassified into a ST elevation MI (STEMI) versus a non-ST elevation MI (non-STEMI) based on ECG changes (Thygesen K; et al, 2007).

2.3 Signs and symptoms:
Rough diagram of pain zones in myocardial infarction (dark red = most typical area, light red = other possible areas, view of the chest).

The onset of symptoms in myocardial infarction (MI) is usually gradual, over several minutes, and rarely instantaneous (Marcus G; et al, 2007). Chest pain is the most common symptom of acute myocardial infarction and is often described as a sensation of tightness, pressure, or squeezing. Chest pain due to ischemia (a lack of blood and hence oxygen supply) of the heart muscle is termed angina pectoris. Pain radiates most often to the left arm, but may also radiate to the lower jaw, neck, right arm, back, and epigastrium, where it may mimic heartburn. Levine's sign, in which the patient localizes the chest pain by clenching their fist over the sternum, has classically been thought to be predictive of cardiac chest pain, although a prospective observational study showed that it had a poor positive predictive value. (Canto J; et al,
Shortness of breath (dyspnea) occurs when the damage to the heart limits the output of the left ventricle, causing left ventricular failure and consequent pulmonary edema. Other symptoms include diaphoresis (an excessive form of sweating)[1], weakness, light-headedness, nausea, vomiting, and palpitations. These symptoms are likely induced by a massive surge of catecholamines from the sympathetic nervous system(Mcsweeney J; et al, 2003). Which occurs in response to pain and the hemodynamic abnormalities that result from cardiac dysfunction. Loss of consciousness (due to inadequate cerebral perfusion and cardiogenic shock) and even sudden death (frequently due to the development of ventricular fibrillation) can occur in myocardial infarctions (Erhordt,et al 2002).

Women and older patients report atypical symptoms more frequently than their male and younger counterparts (Dlee D, 2006). Women also report more numerous symptoms compared with men (2.6 on average vs 1.8 symptoms in men) (Robert B; et al, 2004).

The most common symptoms of MI in women include dyspnea, weakness, and fatigue. Fatigue, sleep disturbances, and dyspnea have been reported as frequently occurring symptoms which may manifest as long as one month before the actual clinically manifested ischemic event. In women, chest pain may be less predictive of coronary ischemia than in men (Davis T, 2004). Approximately half of all MI patients have experienced warning symptoms such as chest pain prior to the infarction Rubins P; et al, 2005). Approximately one fourth of all myocardial infarctions are silent, without chest pain or other symptoms these cases can be discovered later on electrocardiograms, using blood enzyme tests or at autopsy without a prior history of related complaints. A silent course is more common in the elderly, in patients with diabetes mellitus (Boie; et al, 2005).

and after heart transplantation, probably because the donor heart is not connected to nerves of the host In diabetics, differences in pain threshold, autonomic neuropathy, and psychological factors have been cited as possible explanations for the lack of symptoms (Boie; et al, 2005). Any group of symptoms compatible with a sudden interruption of the blood flow to the heart are called an acute coronary syndrome (Fantidis P; et al, 2002). The differential diagnosis includes other catastrophic causes of chest pain, such as pulmonary embolism, aortic dissection, pericardial effusion causing cardiac tamponade, tension pneumothorax, and esophageal rupture. Other
non-catastrophic differentials include gastroesophageal reflux and Tietze's syndrome (Yusuf S; et al, 2005).

2.4 Causes

Heart attack rates are higher in association with intense exertion, be it psychological stress or physical exertion, especially if the exertion is more intense than the individual usually performs (Kader Y; et al, 2003).

Quantitatively, the period of intense exercise and subsequent recovery is associated with about a 6-fold higher myocardial infarction rate (compared with other more relaxed time frames) for people who are physically very fit (Khadar Y; et al, 2003).

For those in poor physical condition, the rate differential is over 35-fold higher (Wilson AM, 2006). One observed mechanism for this phenomenon is the increased arterial pulse pressure stretching and relaxation of arteries with each heart beat which, as has been observed with intravascular ultrasound, increases mechanical "shear stress" on atheromas and the likelihood of plaque rupture (Khadar Y; et al, 2003). Acute severe infection, such as pneumonia, can trigger myocardial infarction. A more controversial link is that between Chlamydophila pneumoniae infection and atherosclerosis While this intracellular organism has been demonstrated in atherosclerotic plaques, evidence is inconclusive as to whether it can be considered a causative factor (Wilson AM, 2006). Treatment with antibiotics in patients with proven atherosclerosis has not demonstrated a decreased risk of heart attacks or other coronary vascular diseases (Peason T; et al, 2003). There is an association of an increased incidence of a heart attack in the morning hours, more specifically around 9 a.m (JanketS; et al, 2003). Some investigators have noticed that the ability of platelets to aggregate varies according to a circadian rhythm, although they have not proven causation (D, Aiuto F; et al, 2006).

Some investigators theorize that this increased incidence may be related to the circadian variation in cortisol production affecting the concentrations of various cytokines and other mediators of inflammation (Loyrbakos A; et al, 2001).

2.5 RISK FACTORS

Six primary risk factors have been identified with the development of atherosclerotic coronary artery disease and MI—hyperlipidemia, diabetes mellitus, hypertension, smoking, male gender, and family history of atherosclerotic arterial
disease. The presence of any risk factor is associated with doubling the relative risk of developing atherosclerotic coronary artery disease (Bex L, et al 2008).

2.5.1 High Blood Cholesterol Level

An elevated level of total cholesterol is associated with an increased risk of coronary atherosclerosis and MI. Laboratory testing provides a measure of certain types of circulating fat particles. Elevated levels of low-density lipoprotein (LDL) cholesterol are associated with an increased incidence of atherosclerosis and MI. A full summary of the National Heart, Lung, and Blood Institute's cholesterol guidelines is available online and includes a free Palm OS software download for point of care (Pearte CA et al 2006).

2.5.2 Diabetes Mellitus

Diabetics have a substantially greater risk of atherosclerotic vascular disease in the heart as well as in other areas of their vasculature. Diabetes increases the risk of MI because it increases the rate of atherosclerotic progression and adversely affects blood cholesterol levels. This accelerated form of atherosclerosis occurs regardless of whether a patient has insulin- or noninsulin-dependent diabetes.

2.5.3 Hypertension

High blood pressure (BP) has consistently been associated with an increased risk of MI. This risk is associated with systolic and diastolic hypertension. The control of hypertension with appropriate medication has been shown to reduce the risk of MI significantly. A full summary of the National Heart, Lung, and Blood Institute's JNC VI guidelines is available online (ab canto JG et al 2007).

2.5.4 Tobacco smoking Use

Certain components of tobacco and tobacco combustion gases are known to damage blood vessel walls. The body's response to this type of injury elicits the formation of atherosclerosis and its progression, thereby increasing the risk of MI. The American Lung Association maintains a website with updates on the public health initiative to reduce tobacco use and is a resource for smoking cessation strategies for patients and health care providers (Boie ET et al 2005).

Alcohol

Studies show that prolonged exposure to high quantities of alcohol can increase the risk of heart attack.
2.5.5 Male Gender

The incidence of atherosclerotic vascular disease and MI is higher in men than women in all age groups. This gender difference in MI incidence, however, narrows with increasing age (Qi M Miyalawa; H, 2003).

(Defined by a body mass index of more than 30 kg/m², or alternatively by waist circumference or waist-hip ratio).

Hyperhomocysteinemia (high homocysteine, a toxic blood amino acid that is elevated when intakes of vitamins B2, B6, B12 and folic acid are insufficient)

Stress (occupations with high stress index are known to have susceptibility for atherosclerosis)

2.5.6 Family History

A family history of premature coronary disease increases an individual's risk of atherosclerosis and MI. The cause of familial coronary events is multifactorial and includes other elements, such as genetic components and acquired general health practices (e.g., smoking, high-fat diet) (Ab Reznik AG et al 2010).

2.6 Pathophysiology

Mechanisms of occlusion

Most MIs are caused by a disruption in the vascular endothelium associated with an unstable atherosclerotic plaque that stimulates the formation of an intracoronary thrombus, which results in coronary artery blood flow occlusion. If such an occlusion persists long enough (20 to 40 minutes), irreversible myocardial cell damage and cell death will occur.

The development of atherosclerotic plaque occurs over a period of years to decades. The initial vascular lesion leading to the development of atherosclerotic plaque is not known with certainty. The two primary characteristics of the clinically symptomatic atherosclerotic plaque are a fibromuscular cap and an underlying lipid-rich core. Plaque erosion may occur because of the actions of metalloproteases and the release of other collagenases and proteases in the plaque, which result in thinning of the overlying fibromuscular cap. The action of proteases, in addition to hemodynamic forces applied to the arterial segment, can lead to a disruption of the endothelium and fissuring or rupture of the fibromuscular cap. The degree of disruption of the overlying endothelium can range from minor erosion to extensive fissuring, which results in an ulceration of the plaque. The loss of structural stability of a plaque often occurs at the juncture of the fibromuscular cap and the vessel wall, a site otherwise
known as the plaque's “shoulder region.” Disruption of the endothelial surface can cause the formation of thrombus via platelet-mediated activation of the coagulation cascade. If a thrombus is large enough to occlude coronary blood flow completely for a sufficient period, MI can result (Androws R, 2005).

2.6.1 Mechanisms of Myocardial Damage
The severity of an MI is dependent on three factors (Mallinson T; et al, 2010). The level of the occlusion in the coronary artery (Kosuge M; et al, 2006). The length of time of the occlusion; and (Erhardt L, 2002). The presence or absence of collateral circulation. Generally, the more proximal the coronary occlusion, the more extensive the amount of myocardium at risk of necrosis. The larger the MI, the greater the chance of death because of a mechanical complication or pump failure. The longer the period of vessel occlusion, the greater the chances of irreversible myocardial damage distal to the occlusion.

The death of myocardial cells first occurs in the area of myocardium most distal to the arterial blood supply—that is, the endocardium. As the duration of the occlusion increases, the area of myocardial cell death enlarges, extending from the endocardium to the myocardium anultimately to the epicardium. The area of myocardial cell death then spreads laterally to areas of watershed or collateral perfusion. Generally, after a 6- to 8-hour period of coronary occlusion, most of the distal myocardium has died. The extent of myocardial cell death defines the magnitude of the MI. If blood flow can be restored to at-risk myocardium, more heart muscle can be saved from irreversible damage or death. (Abc mallinsonY2010)

2.7 Diagnosis
The diagnosis of myocardial infarction is made by integrating the history of the presenting illness and physical examination with electrocardiogram findings and cardiac markers (blood tests for heart muscle cell damage) (Mallinson T; et al, 2010) .

A coronary angiogram allows visualization of narrowings or obstructions on the heart vessels, and therapeutic measures can follow immediately. At autopsy, a pathologist can diagnose a myocardial infarction based on anatomopathological findings.

A chest radiograph and routine blood tests may indicate complications or precipitating causes and are often performed upon arrival to an emergency department. New regional wall motion abnormalities on an echocardiogram are also
suggestive of a myocardial infarction. Echo may be performed in equivocal cases by the on-call cardiologist (Roy, 2006).

In stable patients whose symptoms have resolved by the time of evaluation, Technetium (99mTc) sestamibi (i.e. a "MIBI scan") or thallium-201 chloride can be used in nuclear medicine to visualize areas of reduced blood flow in conjunction with physiologic or pharmacologic stress. (Fishbein MC; v, 1990). Thallium may also be used to determine viability of tissue, distinguishing whether non-functional myocardium is actually dead or merely in a state of hibernation or of being stunned (Rossi S; editor, 2006).

2.7.1 Diagnostic criteria

Been used to diagnose MI; a patient is diagnosed with myocardial infarction if two (probable) or three (definite) of the following criteria are satisfied: Clinical history of ischaemic type chest pain lasting for more than 20 minutes; Changes in serial ECG tracings; rise and fall of serum cardiac biomarkers such as creatine kinase-MB fraction and troponin. The WHO criteria were refined in 2000 to give more prominence to cardiac biomarkers. According to the new guidelines, a cardiac troponin rise accompanied by either typical symptoms, pathological Q waves, ST elevation or depression or coronary intervention are diagnostic of MI (Mozaffarian D; et al, 2010).

2.7.2 Physical examination

The general appearance of patients may vary according to the experienced symptoms; the patient may be comfortable, or restless and in severe distress with an increased respiratory rate. A cool and pale skin is common and points to vasoconstriction. Some patients have low-grade fever (38–39 °C). Blood pressure may be elevated or decreased, and the pulse can become irregular (Peters R J; et al, 2003). If heart failure ensues, elevated jugular venous pressure and hepatojugular reflux, or swelling of the legs due to peripheral edema may be found on inspection. Rarely, a cardiac bulge with a pace different from the pulse rhythm can be felt on precordial examination. Various abnormalities can be found on auscultation, such as a third and fourth heart sound, systolic murmurs, paradoxical splitting of the second heart sound, a pericardial friction rub and rales over the lung. (Ray KK; Cannon cp, 2005).

2.7.3 Electrocardiogram

Main article: Electrocardiography in myocardial infarction 12-lead electrocardiogram showing ST-segment elevation (orange) in I, aVL and V1-V5 with
reciprocal changes (blue) in the inferior leads, indicative of an anterior wall myocardial infarction. The primary purpose of the electrocardiogram is to detect ischemia or acute coronary injury in broad, symptomatic emergency department populations. A serial ECG may be used to follow rapid changes in time. The standard 12 lead ECG does not directly examine the right ventricle, and is relatively poor at examining the posterior basal and lateral walls of the left ventricle. In particular, acute myocardial infarction in the distribution of the circumflex artery is likely to produce a nondiagnostic ECG.\(^{[65]}\) (KeatingG, Plosker G; 2004). The use of additional ECG leads like right-sided leads V3R and V4R and posterior leads V7, V8, and V9 may improve sensitivity for right ventricular and posterior myocardial infarction. The 12 lead ECG is used to classify patients into one of three groupsthose with ST segment elevation or new bundle branch block (suspicious for acute injury and a possible candidate for acute reperfusion therapy with thrombolytics or primary PCI), those with ST segment depression or T wave inversion (suspicious for ischemia), and those with a so-called non-diagnostic or normal ECG (Leaf A; et al, 2005). A normal ECG does not rule out acute myocardial infarction. Mistakes in interpretation are relatively common, and the failure to identify high risk features has a negative effect on the quality of patient care (Brouwer LA; et al, 2006).

1.7.4 Cardiac markers

Cardiac marker

Cardiac markers or cardiac enzymes are proteins that leak out of injured myocardial cells through their damaged cell membranes into the bloodstream. Until the 1980s, the enzymes SGOT and LDH were used to assess cardiac injury. Now, the markers most widely used in detection of MI are MB subtype of the enzyme creatine kinase and cardiac troponins T and I as they are more specific for myocardial injury. The cardiac troponins T and I which are released within 4–6 hours of an attack of MI and remain elevated for up to 2 weeks, have nearly complete tissue specificity and are now the preferred markers for assessing myocardial damage (Raitt MH; et al, 2005). Heart-type fatty acid binding protein is another marker, used in some home test kits. Elevated troponins in the setting of chest pain may accurately predict a high likelihood of a myocardial infarction in the near future.\(^{[69]}\) New markers such as glycogen phosphorylase isoenzyme BB are under investigation (MeineTJ; et al, 2005). The diagnosis of myocardial infarction requires two out of three components (history, ECG, and enzymes). When damage to the heart them are taken over a 24-hour period.
Because these enzyme levels are not elevated immediately following a heart attack, patients presenting with chest pain are generally treated with the assumption that a myocardial infarction has occurred and then evaluated for a more precise diagnosis (Cobello JB; et al, 2010).

2.7.5 Angiography (Angiogram of the coronary arteries)

Coronary catheterization

In difficult cases or in situations where intervention to restore blood flow is appropriate, coronary angiography can be performed. A catheter is inserted into an artery (usually the femoral artery) and pushed to the vessels supplying the heart. A radio-opaque dye is administered through the catheter and a sequence of x-rays (fluoroscopy) is performed. Obstructed or narrowed arteries can be identified, and angioplasty applied as a therapeutic measure (see below). Angioplasty requires extensive skill, especially in emergency settings. It is performed by a physician trained in interventional cardiology (Aiuto et al 2006 ).

2.8 Prevention

The risk of a recurrent myocardial infarction decreases with strict blood pressure management and lifestyle changes, chiefly smoking cessation, regular exercise, a sensible diet for patients with heart disease, and limitation of alcohol intake.

Patients are usually commenced on several long-term medications post-MI, with the aim of preventing secondary cardiovascular events such as further myocardial infarctions, congestive heart failure or cerebrovascular accident (CVA). Unless contraindicated, such medications may incl de (Trisha, 2006).

Evidence supports the consumption of polyunsaturated fats instead of saturated fats as a measure of decreasing coronary heart disease.

Antiplatelet drug therapy such as aspirin and/or clopidogrel should be continued to reduce the risk of plaque rupture and recurrent myocardial infarction. Aspirin is first-line, owing to its low cost and comparable efficacy, with clopidogrel reserved for patients intolerant of aspirin. The combination of clopidogrel and aspirin may further reduce risk of cardiovascular events, however the risk of hemorrhage is increased. Beta blocker therapy such as metoprolol or carvedilol should be commenced.[80] These have been particularly beneficial in high-risk patients such as those with left ventricular dysfunction and/or continuing cardiac ischaemia.[81] β-Blockers decrease mortality and morbidity. They also improve symptoms of cardiac ischaemia in NSTEMI. (Patient UK; M.I, 2010).
ACE inhibitor therapy should be commenced 24–48 hours post-MI in hemodynamically-stable patients, particularly in patients with a history of MI, diabetes mellitus, hypertension, anterior location of infarct (as assessed by ECG), and/or evidence of left ventricular dysfunction. ACE inhibitors reduce mortality, the development of heart failure, and decrease ventricular remodelling post-MI. Statin therapy has been shown to reduce mortality and morbidity post-MI. The effects of statins may be more than their LDL lowering effects. The general consensus is that statins have plaque stabilization and multiple other ("pleiotropic") effects that may prevent myocardial infarction in addition to their effects on blood lipidsu(Morrow DA, et al 2002).

The aldosterone antagonist agent eplerenone has been shown to further reduce risk of cardiovascular death post-MI in patients with heart failure and left ventricular dysfunction, when used in conjunction with standard therapies above(Norrison LJ; et al, 200).

Spironolactone is another option that is sometimes preferable to eplerenone due to cost.Omega-3 fatty acids, commonly found in fish, have been shown to reduce mortality post-MI (R. While the mechanism by which these fatty acids decrease mortality is unknown, it has been postulated that the survival benefit is due to electrical stabilization and the prevention of ventricular fibrillation.[88] However, further studies in a high-risk subset have not shown a clear-cut decrease in potentially fatal arrhythmias due to omega-3 fatty acids (Terkelsen CJ; et al, 2005). Blood donation may reduce the risk of heart disease for men. But the link has not been firmly established. (Rokos I; et al 2007.

2.9 Management

An MI is a medical emergency which requires immediate medical attention. Treatment attempts to salvage as much myocardium as possible and to prevent further complications thus the phrase "time is muscle (Cannon C, 1999). Oxygen, aspirin, and nitroglycerin are usually administered as soon as possible. Morphine was classically used if nitroglycerin was not effective however it may increase mortality in the setting of NSTEMI( CeCord J ,et al April 2008 ).

A 2009 and 2010 review of high flow oxygen in myocardial infarction found increased mortality and infarct size, calling into question the recommendation about its routine use (Faxon DP ; et al, 2005).
2.9.1 Antiplatelet agents

Aspirin have been shown to markedly reduce mortality. It can be taken quickly (if the person can tolerate aspirin) (Dowdall N, 2000).

Aspirin has an antiplatelet effect which inhibits formation of further thrombi (blood clots) that clog arteries. Chewing is the preferred method of administration, so that it can be absorbed quickly. Dissolved soluble preparations or sublingual administration can also be used. U.S. guidelines recommend a dose of 162–325 mg. Australian guidelines recommend a dose of 150–300 mg. Additional antiplatelet agents such as clopidogrel are also used (Canto JG, 2000).

Some guidelines advise that the dose of Clopidogrel given is dictated by what further treatment is anticipated:

300 mg of clopidogrel given orally for patients who are receiving, will receive, thrombolysis 600 mg of clopidogrel to be given orally where primary percutaneous coronary intervention (angioplasty) is anticipated.

2.9.2 Nitroglycerin

Glyceryl trinitrate (nitroglycerin) sublingually (under the tongue) or Buccally can be given if available. The Glyceryl Trinitrate acts as a Nitrous oxide donor to smooth muscles cells adjacent to the coronary artery endothelium resulting in increased vasodilation and increased coronary blood flow. Nitroglycerin should not be given if certain inhibitors such as Viagra, Cialis, and Levitra have been taken by the casualty within the previous 12 hours as the combination of the two could cause a serious drop in blood pressure.

2.9.3 Reperfusion

The concept of reperfusion has become so central to the modern treatment of acute myocardial infarction, that we are said to be in the reperfusion. Patients who present with suspected acute myocardial infarction and ST segment elevation (STEMI) or new bundle branch block on the 12 lead ECG are presumed to have an occlusive thrombosis in an epicardial coronary artery. They are therefore candidates for immediate reperfusion, either with thrombolytic therapy, percutaneous coronary intervention (PCI) or when these therapies are unsuccessful, bypass surgery.

Individuals without ST segment elevation are presumed to be experiencing either unstable angina (UA) or non-ST segment elevation myocardial infarction (NSTEMI). They receive many of the same initial therapies and are often stabilized with antiplatelet drugs and anticoagulated. If their condition remains (hemodynamically)
stable, they can be offered either late coronary angiography with subsequent restoration of blood flow (revascularization), or non-invasive stress testing to determine if there is significant ischemia that would benefit from revascularization. If hemodynamic instability develops in individuals with NSTEMIs, they may undergo urgent coronary angiography and subsequent revascularization. The use of thrombolytic agents is contraindicated in this patient subset, however (Shin P; et al, 1983). The basis for this distinction in treatment regimens is that ST segment elevations on an ECG are typically due to complete occlusion of a coronary artery. On the other hand, in NSTEMIs there is typically a sudden narrowing of a coronary artery with preserved (but diminished) flow to the distal myocardium. Anticoagulation and antiplatelet agents are given to prevent the narrowed artery from occluding. At least 10% of patients with STEMI do not develop myocardial necrosis (as evidenced by a rise in cardiac markers) and subsequent Q waves on EKG after reperfusion therapy. Such a successful restoration of flow to the infarct-related artery during an acute myocardial infarction is known as "aborting" the myocardial infarction. If treated within the hour, about 25% of STEMI can be aborted (Podril, Philip; et al, 2001).

2.9.4 Rehabilitation

Additional objectives are to prevent life-threatening arrhythmias or conduction disturbances. This requires monitoring in a coronary care unit and protocolised administration of antiarrhythmic agents. Antiarrhythmic agents are typically only given to individuals with life-threatening arrhythmias after a myocardial infarction and not to suppress the ventricular ectopy that is often seen after a myocardial infarction (Sung Ruey J; et al, 2000) & (Hochman JS; et al, 1999). Cardiac rehabilitation aims to optimize function and quality of life in those afflicted with a heart disease. This can be with the help of a physician, or in the form of a cardiac rehabilitation program. Physical exercise is an important part of rehabilitation after a myocardial infarction, with beneficial effects on cholesterol levels, blood pressure, weight, stress and mood (Krumholz H; et al, 2006). Some patients become afraid of exercising because it might trigger another infarct. Patients are stimulated to exercise, and should only avoid certain exerting activities. Local authorities may place limitations on driving motorised vehicles (Fox KA; et al, 2006). In most cases, the advice is a gradual increase in physical exercise during about 6-8 weeks following an MI. If it doesn't feel to hard for the patient, the advice about exercise is then the same as applies to anyone else to gain health benefits, that is, at least 20-30 minutes of
moderate exercise on most days (at least five days per week) to the extent of getting slightly short of breath (Weir RA; et al, 2006). Some people are afraid to have sex after a heart attack. Most people can resume sexual activities after 3 to 4 weeks. The amount of activity needs to be dosed to the patient's possibilities (KKrumhlz H; et al, 2009).

2.9.5 Emergency services

When symptoms of myocardial infarction occur, people wait an average of three hours, instead of doing what is recommended: calling for help immediately (Nicod P; et al, 1989 ) & ( Liew R ; et al, 2006). Acting immediately by calling the emergency services can improve outcomes for two reasons. First and most importantly, the emergency services can immediately save life from ventricular fibrillation, most often primary ventricular fibrillation, which occurs unexpectedly in more than 10% of all infarctions especially during the first hour of symptoms[citation needed][113] and second, immediate treatment of myocardial infarction can prevent sustained damage to the heart ("time is muscle") Emergency Medical Services (EMS) Systems vary considerably in their ability to evaluate and treat patients with suspected acute myocardial infarction. Some provide as little as first aid and early defibrillation. Others employ highly trained paramedics with sophisticated technology and advanced protocols (White HD; et al, Augus 2008).

Paramedic services are capable of providing oxygen, IV access, sublingual nitroglycerine, morphine, and aspirin. Some advanced paramedic systems can also perform 12-lead ECGs[citation needed]. If a STEMI is recognized the paramedic may be able to contact the local PCI hospital and alert the emergency room physician, and staff of the suspected AMI. Some Paramedic services are capable of providing thrombolytic therapy in the prehospital setting, allowing reperfusion of the myocardium (Chaffar A; et al, 2004). With primary PCI emerging as the preferred therapy for ST-segment elevation myocardial infarction, EMS can play a key role in reducing door to balloon intervals (the time from presentation to a hospital ER to the restoration of coronary artery blood flow) by performing a 12-lead ECG in the field and using this information to triage the patient to the most appropriate medical facile (Liew R; et al, 2006 ) . In addition, the 12-lead ECG can be transmitted to the receiving hospital, which enables time saving decisions to be made prior to the arrival of the patient. This may include a "cardiac alert" or "STEMI alert" that calls in off duty personnel in areas where the cardiac cath lab is not staffed 24 hours a day Even
in the absence of a formal alerting program, prehospital 12-lead ECGs are independently associated with reduced door to treatment intervals in the emergency department (Scha chinger V, et al 2006).

2.10 Special cases (Cocaine)

Cocaine associated myocardial infarction should be managed in a manner similar to other patients with acute coronary syndrome except beta blockers should not be used and benzodiazepines should be administered early (Christman KL, et al 2006).

The treatment itself may have complications. If attempts to restore the blood flow are initiated after a critical period of only a few hours, the result may be a reperfusion injury instead of amelioration ("time is muscle") (Scha chinger V; et al, 2006).

2.10.1 Air travel

Certified personnel traveling by commercial aircraft may be able to assist an MI patient by using the on-board first aid kit, which may contain some cardiac drugs (such as glyceryl trinitrate spray, aspirin, or opioid painkillers), an AED,[125] and oxygen. Pilots may divert the flight to land at a nearby airport. Cardiac monitors are being introduced by some airlines, and they can be used by both on-board and ground-based physicians (Sung Ruey J, et al 2000) & (Hochman JS, et al 1999).

2.10.2 Complications

Complications may occur immediately following the heart attack (in the acute phase), or may need time to develop (a chronic problem). After an infarction, an obvious complication is a second infarction, which may occur in the domain of another atherosclerotic coronary artery, or in the same zone if there are any live cells left in the infarct (Krumh H; et al, 2009).

2.10.3 Congestive heart failure

A myocardial infarction may compromise the function of the heart as a pump for the circulation, a state called heart failure. There are different types of heart failure; left- or right-sided (or bilateral) heart failure may occur depending on the affected part of the heart, and it is a low-output type of failure. If one of the heart valves is affected, this may cause dysfunction, such as mitral regurgitation in the case of left-sided coronary occlusion that disrupts the blood supply of the papillary muscles. The incidence of heart failure is particularly high in patients with diabetes and requires special management strategies (White HD; et al, Augus 2008).
2.10.4 Myocardial rupture

Myocardial rupture is most common three to five days after myocardial infarction, commonly of small degree, but may occur one day to three weeks later. In the modern era of early revascularization and intensive pharmacotherapy as treatment for MI, the incidence of myocardial rupture is about 1% of all MIs.[128] This may occur in the free walls of the ventricles, the septum between them, the papillary muscles, or less commonly the atria. Rupture occurs because of increased pressure against the weakened walls of the heart chambers due to heart muscle that cannot pump blood out effectively. The weakness may also lead to ventricular aneurysm, a localized dilation or ballooning of the heart chamber.

Risk factors for myocardial rupture include completion of infarction (no revascularization performed), female sex, advanced age, and a lack of a previous history of myocardial infarction. In addition, the risk of rupture is higher in individuals who are revascularized with a thrombolytic agent than with PCI.[129][130] The shear stress between the infarcted segment and the surrounding normal myocardium (which may be hypercontractile in the post-infarction period) makes it a nidus for rupture (Weir RA; et al 2006).

Rupture is usually a catastrophic event that may result a life-threatening process known as cardiac tamponade, in which blood accumulates within the pericardium or heart sac, and compresses the heart to the point where it cannot pump effectively. Rupture of the intraventricular septum (the muscle separating the left and right ventricles) causes a ventricular septal defect with shunting of blood through the defect from the left side of the heart to the right side of the heart, which can lead to right ventricular failure as well as pulmonary overcirculation. Rupture of the papillary muscle may also lead to acute mitral regurgitation and subsequent pulmonary edema and possibly even cardiogenic shock. (Scha chinger V; et al, 2006).

2.10.5 Arrhythmia

A 12 lead electrocardiogram showing ventricular tachycardia.

Since the electrical characteristics of the infarcted tissue change, arrhythmias are a frequent complication.[132] The re-entry phenomenon may cause rapid heart rates (ventricular tachycardia and even ventricular fibrillation), and ischemia in the electrical conduction system of the heart may cause a complete heart block (when the impulse from the sinoatrial node, the normal cardiac pacemaker, does not reach the heart chambers) Christman KL; et al, 2006).
2.10.6 Pericarditis

As a reaction to the damage of the heart muscle, inflammatory cells are attracted. The inflammation may reach out and affect the heart sac. This is called pericarditis. In Dressler's syndrome, this occurs several weeks after the initial event. (KKrumhlz H; et al, 2009).

2.10.7 Cardiogenic shock

A complication that may occur in the acute setting soon after a myocardial infarction or in the weeks following it is cardiogenic shock. Cardiogenic shock is defined as a hemodynamic state in which the heart cannot produce enough of a cardiac output to supply an adequate amount of oxygenated blood to the tissues of the body (White HD et al Augus 2008).

While the data on performing interventions on individuals with cardiogenic shock is sparse, trial data suggests a long-term mortality benefit in undergoing revascularization if the individual is less than 75 years old and if the onset of the acute myocardial infarction is less than 36 hours and the onset of cardiogenic shock is less than 18 hours. If the patient with cardiogenic shock is not going to be revascularized, aggressive hemodynamic support is warranted, with insertion of an intra-aortic balloon pump if not contraindicated. If diagnostic coronary angiography does not reveal a culprit blockage that is the cause of the cardiogenic shock, the prognosis is poor (Scha chinger V, et al 2006).

2.11 Prognosis

The prognosis post myocardial infarction varies greatly, depending on a person's health, the extent of the heart damage and the treatment given. For the period 2005-2008 in the United States the median mortality at 30 days was 16.6% with a range from 10.9% to 24.9% depending on the hospital. Using variables available in the emergency room, people with a higher risk of adverse outcome can be identified. One study found that 0.4% of patients with a low risk profile died after 90 days, whereas in high risk people it was 21.1% (KKrumhlz H; et al, 2009). Some of the more reproduced risk stratifying factors include: age, hemodynamic parameters (such as heart failure, cardiac arrest on admission, systolic blood pressure, or Killip class of two or greater), ST-segment deviation, diabetes, serum creatinine, peripheral vascular disease and elevation of cardiac markers. Assessment of left ventricular ejection fraction may increase the predictive power the prognostic importance of Q-waves is debated. Prognosis is significantly worsened if a mechanical complication such as
papillary muscle or myocardial free wall rupture occur Morbidity and mortality from myocardial infarction has improved over the years due to better treatment (Scha chinger V; et al, 2006 ).

2.12 Nursing Care Plan for MCI

Nursing Care Plan for MCI

Nursing care plan to the patients with Myocardial Infarction. Patients who suffer Myocardial Infarction they have many symptom include chest pain, shortness of breath, nausea, vomiting, palpitations, sweating, and anxiety or a feeling of impending doom. In physical examination to the patient with Myocardial Infarction cases appear some of general symptom like comfortable, or restless and in severe distress with an increased respiratory rate (KKrumhlz H; et al, 2009). The Nurse in medical care to take an action as nursing intervention they will collecting data and priority nursing care plane according to the patients condition. This is some nursing care plan (NCP) for patients with Myocardial Infarction related to patient condition:

1. Nursing care plan for chest discomfort (pain) due to an imbalance Oxygen (O2) demand supply.
   - Asses the severity, location & duration of pain (report).
   - Administer O2 with semi-fowler's position.
   - Obtain a 12 lead ECG during pain.
   - Monitor vital signs.
   - Administer Nitroglycerine & Narcotic analgesics as ordered.
   - Administer & Monitor Thrombolytic therapy.
   - Ensure rest & sleep, provide a comfortable environment.
   - Monitor patient's response to drug therapy.

2. Nursing care plan for potential Arrhythmias related to decrease cardiac output.
   - Monitor cardiac rate, rythm & conduction (report any change).
   - Observe vital signs, ECG, urine output, skin temp & colour.
   - Administer prophylactic anti-arrhythmic & other drugs as ordered.
   - Administer IV fluids.
   - Promote physical & mental rest & comfort.
   - Monitor laboratorium result.
   - Keep anti-dysrhythmic drugs & defibrillator ready.
3. Nursing care plan for respiratory difficulties (dyspnoea) due to decrease CO
   - Asses for any dyspnoea, abnormal breath sound (report).
   - Ensure propped up position, rest & comfort.
   - Administer O2 & drugs as ordered.
   - Psycological support, give liquid diet.

4. Nursing care plan for anxiety & fear of death
   - Encourage patient & family to express fear or anxiety by interest, listening, caring.
   - Explain the procedures being done on him.
   - Psycological & spiritual support.
   - Administer morphine or other anti-anxiety drug.

5. Nursing care plan for activity intolerance related to limitations imposed by Myocardial Infarction
   - Explain to the patient if he need Bed rest to decrease O2 consumption.
   - give liquid diet & stool softners to avoid constipation.
   - help for personal hygienic activity.
   - Watch for dyspnoea, chest pain during activity.
   - Administer O2 as needed.

6. Nursing care plan for potential for complications of thrombolytic therapy
   - Watch for sign & symptom of bleeding, arrhythmias ect.
   - Fix cannula for IV medication & blood collection.
   - Protect patient from any injury.
   - Monitor bleeding time & coagulation profile.
   - Keep anti-coagulant antidote ready (protamine sulphate ect).
   - Monitor vital signs.

7. Nursing care plan for discharge medications, follow up & Health teachings
   - Explain the name, purpose & side effect of each medicine.
   - Ask for regular follow up & continuing medications at home.
   - Teach about management of chest pain at home.
   - Teach how to take Nitroglycerine.
   - Explain diet to avoid large meals, rest after meals.
   - Ask to seek immediate medical aid if chest pain not relieved after taking GTN and rest (Lourbakos A, et al 200 ).

2.13 Previous studies
Study the nursing care of patients with acute myocardial infraction in Omdurman hospital 2011.

Show the result (62%) of the studies are good knowledge about O2 administer , (64%) of the studies show the nurses know causes of myocardial infraction , (61%) know uses of ECG To patients with myocardial infraction , and (56%) %) of the studies sample show knowledge about education patients how have myocardial infraction.

Knowledge and attitude and practice of myocardial infraction patients in general Khartoum hospital and in effects of education intervention in Khartoum stat and elshabb hospital 2011.

Show the result (67%) of the studies knowledge define of myocardial infraction, (45%) of the studies knowledge causes of myocardial infraction , and (67%) of the studies knowledge sign and symptom of myocardial infraction , and (67%).

Assessment of nurses knowledge about rehabilitation of patient following myocardial infraction in coronary care unit –Ahmed Gasim Cardiac Surgery and Renal Translation Center 2010—2011.

Results; It was found the majority of participants (34%) had bachelor degree , (52 %) was fair knowledge of participants regarding rehabilitation of patient following myocardial infraction.
CHAPTER 3
Materials and Methods

3.1 Study Design:
This descriptive hospital based study was conducted at Ahmed Gasim Hospital (Cardic surgery and renal transplantation center) to assess nurse's knowledge, attitude and practices regarding myocardial Infraction in Ahmed Gasim Hospital cardic center and renal Transplantation during the period from May 2012 to November 2013.

3.2 Study Area:
The study was carried out in general special unites, at ahmed gasim hospital in Khartoum State, The hospitals was established at consisted of (121) beds and divided in many departments, intensive care unit (ICU), computer unites, echo department, catheter laboratory, heart open surgery, statistic units, outpatient unites, pharmacy unites, renal transplant unites, oxygen center department, medicine & sugary word, Ultra Sound (US) and X-ray department, Emergency Unit, big Theater, Blood bank, Hospital is the one of the well-established heath care centre in Sudan with large catchment's area, where all patients came from Khartoum state, nearest states and nearest country.
**Table 3.1** Distribution of man power caring for the patients in ahmed gasim hospital Cardic center and renal transplantation

<table>
<thead>
<tr>
<th>Type of health care provider</th>
<th>NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consultants</td>
<td>18</td>
</tr>
<tr>
<td>Registrars</td>
<td>22</td>
</tr>
<tr>
<td>Medical officers</td>
<td>36</td>
</tr>
<tr>
<td>Sisters</td>
<td>75</td>
</tr>
<tr>
<td>Auxiliary nurses</td>
<td>14</td>
</tr>
<tr>
<td>Anaesthesia technicians</td>
<td>05</td>
</tr>
<tr>
<td>Dieticians</td>
<td>12</td>
</tr>
<tr>
<td>Lab technicians</td>
<td>15</td>
</tr>
<tr>
<td>X-ray technicians</td>
<td>12</td>
</tr>
<tr>
<td>Radiologists</td>
<td>06</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>08</td>
</tr>
<tr>
<td>Total</td>
<td>223</td>
</tr>
</tbody>
</table>

**Source:** Statistical Department of the hospital 2012.

3.3 Study Population:

The population of the present study included all nurses who had work in spescific cardiac as ICU and cardiac unites direct contact with patients

3.3.1 Inclusion Criteria

- All qualified nurses who had direct contact with cardic patients in Ahmed Gassim Hospital.
- All nurses with one year experience and more in cardic department

3.3.2 Exclusion Criteria:

- Nurses have experience less than 1 year cardiology department..
3.4 Sampling size

All qualified nurses (65) who worked in the cardiac units and were responsible for caring of patients at the hospital were included in the study during the period from May 2012 to September 2013.

3.5 Data collection tools

Two tools of data collection were used:

**Tool 1: Interview questionnaire:**

Structured questionnaire was designed by the researcher and utilized for two purposes as follows:

First: To find out the general characteristics of the study sample. It contained the basic data related to their general characteristics such as age, education, and years of experience.

Second: To assess nurse’s knowledge regarding variables of myocardial infarction. It includes questions about definition of myocardial infarction, types causes, management, complications, and nursing (role & intervention).

observation check list who was designed by the researcher to assess clinical skills for nurses during caring of patients with myocardial infarction.

**Tool 2: Check List**

3.6 Sampling technique

- Official letters for the head manager and Matron of Ahmed Gassim hospital for approval to collect the data.

All qualified nurses with one year experience and more were collected from the available staff included 65 nurses who are responsible for caring of M.I patient at time of this research execution.

- Explanation for the nurses about the study questionnaire.
- Questionnaire was distributed for each available nurse to fill within 25-30 minutes under the researcher guidance.

3.7 Data analysis

Data collected was incorporated and entered in the computer, described, analyzed and using the statistical package for social sciences (SPSS).
CHAPTER 4
Table 4.1: Distribution of the study sample according to their general characteristics.

<table>
<thead>
<tr>
<th>Items</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-25</td>
<td>28</td>
<td>43.3%</td>
</tr>
<tr>
<td>26-30</td>
<td>21</td>
<td>32.2%</td>
</tr>
<tr>
<td>31-35</td>
<td>09</td>
<td>13.7%</td>
</tr>
<tr>
<td>36-or more years</td>
<td>07</td>
<td>10.8%</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>23</td>
<td>35.5%</td>
</tr>
<tr>
<td>Female</td>
<td>42</td>
<td>64.5%</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>Souse of knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Colleague</td>
<td>40</td>
<td>61.5%</td>
</tr>
<tr>
<td>Internet</td>
<td>21</td>
<td>32.3%</td>
</tr>
<tr>
<td>Others</td>
<td>04</td>
<td>6.2%</td>
</tr>
<tr>
<td>Total</td>
<td>65</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table (4.1) This table shows that (43.3%) of the study sample at ages ranged between (20-25) years (64.5%) of the study sample were females, and (61.5%) of them their Souse of knowledge were colleagues.
Table 4.2: Distribution of the study sample according to their knowledge regarding Definition, Type, Causes, Risk factor, Sign and symptom of Myocardial infarction.

<table>
<thead>
<tr>
<th>Knowledge of nurses</th>
<th>Correct Answers</th>
<th>Incorrect Answers</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Definitions</td>
<td>45</td>
<td>69.9%</td>
<td>20</td>
</tr>
<tr>
<td>Types</td>
<td>41</td>
<td>63.0%</td>
<td>24</td>
</tr>
<tr>
<td>Causes</td>
<td>34</td>
<td>52.3%</td>
<td>31</td>
</tr>
<tr>
<td>Risk factor</td>
<td>40</td>
<td>61.5%</td>
<td>25</td>
</tr>
<tr>
<td>Main signs &amp; symptoms</td>
<td>44</td>
<td>67.8%</td>
<td>21</td>
</tr>
</tbody>
</table>

Table (4.2) this table shows that (69.9%) of the study sample responded with correct answers regarding Definitions of M.I, and only (52.3%) of them known the causes of Myocardial infarction.
Table 4.3: Distribution of the study sample according to their knowledge regarding to diagnosis, Prevention of the risk, Management & Complication of myocardial infraction

<table>
<thead>
<tr>
<th>Knowledge of nurses</th>
<th>Correct Answers</th>
<th>Incorrect Answers</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>51</td>
<td>78.8%</td>
<td>14</td>
</tr>
<tr>
<td>Prevented of the risk</td>
<td>43</td>
<td>66.2%</td>
<td>22</td>
</tr>
<tr>
<td>Management of M.I</td>
<td>42</td>
<td>64.5%</td>
<td>23</td>
</tr>
<tr>
<td>Complications</td>
<td>45</td>
<td>69.9%</td>
<td>20</td>
</tr>
</tbody>
</table>

Table (4.3) This table shows that (78.8%) of the study sample responded with correct answers regarding Diagnosis of M.I, while only (64.5%) of them know management of Myocardial infarction.
Table 4.4 Distribution of the study sample according to their knowledge regarding information of health education about life style, diet, work issues, driving and flying issues, stress anxiety, relaxation and Sexual relation.

<table>
<thead>
<tr>
<th>Knowledge of nurses information of health education</th>
<th>Correct Complete</th>
<th>Incorrect Complete</th>
<th>Incorrect</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
<td>%</td>
</tr>
<tr>
<td>life style</td>
<td>43</td>
<td>66.6%</td>
<td>21</td>
<td>32.2%</td>
</tr>
<tr>
<td>Diet</td>
<td>20</td>
<td>30.7%</td>
<td>29</td>
<td>69.2%</td>
</tr>
<tr>
<td>work issues</td>
<td>40</td>
<td>61.2%</td>
<td>25</td>
<td>38.8%</td>
</tr>
<tr>
<td>driving &amp; flying issue</td>
<td>38</td>
<td>58.2%</td>
<td>25</td>
<td>38.8%</td>
</tr>
<tr>
<td>Stress anxiety &amp; relaxation</td>
<td>41</td>
<td>63.3%</td>
<td>22</td>
<td>33.4%</td>
</tr>
<tr>
<td>Sexual relation</td>
<td>37</td>
<td>56.8%</td>
<td>23</td>
<td>35.5%</td>
</tr>
</tbody>
</table>

Table (4.4) this table shows that about (30.7%) of the study sample responded correctly answers regarding diet while (63.3%) of them know Stress anxiety & relaxation.
Table 4.5: Distribution of the study sample according to their knowledge regarding nursing intervention in emergency room, anxiety and fear from death, arrhythmias related to cardiac output.

<table>
<thead>
<tr>
<th>Knowledge of nurses about intervention in medical care</th>
<th>Done correctly</th>
<th>Done incorrectly</th>
<th>Not done</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>In emergency room</td>
<td>50</td>
<td>77%</td>
<td>14</td>
<td>21.5%</td>
</tr>
<tr>
<td>anxiety and fear from death</td>
<td>44</td>
<td>67.8%</td>
<td>19</td>
<td>29.2%</td>
</tr>
<tr>
<td>arrhythmias related to cardiac output</td>
<td>41</td>
<td>63.3%</td>
<td>24</td>
<td>36.7%</td>
</tr>
</tbody>
</table>

Table (4.5) This table shows that (77%) of the study sample responded correctly regarding role of the nurse in emergency room, and (76.8%) of them responded correctly regarding care of patient with anxiety and fear from death.
Table (4.6): Distribution of the study sample according to their attitude regarding Myocardial infraction.

Table (4.6): This table shows that (70.8%) of nurses agree about Myocardial infraction can be prevented by H.E, and (67.8%) of them agree about the nurses can contribute in diagnoses of Myocardial infraction.

<table>
<thead>
<tr>
<th>Items</th>
<th>Agree NO.</th>
<th>%</th>
<th>Note agree NO.</th>
<th>%</th>
<th>TOTAL NO.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.I can be prevented by H.E</td>
<td>46</td>
<td>70.8%</td>
<td>19</td>
<td>29.2%</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>Provided psychological support</td>
<td>32</td>
<td>49.9%</td>
<td>33</td>
<td>50.1%</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>Effective in medical treatment of Myocardial infraction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>essential Knowledge for nurse work in C.C.U</td>
<td>41</td>
<td>63.3%</td>
<td>24</td>
<td>36.7%</td>
<td>65</td>
<td>100%</td>
</tr>
<tr>
<td>The nurse can be contribute in Diagnoses of Myocardial infraction</td>
<td>44</td>
<td>67.8%</td>
<td>21</td>
<td>32.2%</td>
<td>65</td>
<td>100%</td>
</tr>
</tbody>
</table>
Table (4.7) : Distribution of the study sample according to their performance or Practice of Nurses care of patients In emergency room.

<table>
<thead>
<tr>
<th>In emergency room the nurses must be do</th>
<th>Done correctly</th>
<th>Done in correctly</th>
<th>Not Done</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NO.</td>
<td>%</td>
<td>NO.</td>
<td>%</td>
</tr>
<tr>
<td>Fix cannula</td>
<td>41</td>
<td>63.3%</td>
<td>15</td>
<td>23.3%</td>
</tr>
<tr>
<td>ECG</td>
<td>40</td>
<td>61.5%</td>
<td>22</td>
<td>33.8%</td>
</tr>
<tr>
<td>administer O2</td>
<td>39</td>
<td>60%</td>
<td>26</td>
<td>40%</td>
</tr>
<tr>
<td>Monitor vital sign</td>
<td>36</td>
<td>55.3%</td>
<td>29</td>
<td>44.7%</td>
</tr>
</tbody>
</table>

Table (4.7): This table shows that (63.%) of the study sample fix cannula correctly ,and (61.5%) of them performance E.C.G correctly .
Table (4.8): Distribution of the study sample according to their performance regarding care of patients.

<table>
<thead>
<tr>
<th>In car of PT the nurses must be do</th>
<th>Done correctly</th>
<th>Done in correctly</th>
<th>Not Done</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>assess location of pain</td>
<td>35 53.4%</td>
<td>30 46.6%</td>
<td>00 0%</td>
<td>65 100%</td>
</tr>
<tr>
<td>Administer O₂</td>
<td>40 61.5%</td>
<td>24 37%</td>
<td>01 1.5%</td>
<td>65 100%</td>
</tr>
<tr>
<td>Obtain a12 leeds</td>
<td>34 52.3%</td>
<td>29 44.7%</td>
<td>02 3.0%</td>
<td>65 100%</td>
</tr>
<tr>
<td>Monitor vital sign</td>
<td>46 70.8%</td>
<td>19 29.2%</td>
<td>00 0%</td>
<td>65 100%</td>
</tr>
</tbody>
</table>

Table (4.8): This table shows that (70.8%) of the study sample Monitor vital sign in correctly, and (61.5%) of them responded correctly regarding Administer O₂ correctly.
Table (4.9): Distribution of the study sample according to their performance regarding dyspnea.

<table>
<thead>
<tr>
<th>With dyspnea the nurses must be done</th>
<th>Done correctly</th>
<th>Done incorrectly</th>
<th>Not Done</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer O2 in pain</td>
<td>30 46.6%</td>
<td>35 53.4%</td>
<td>00 0%</td>
<td>65</td>
</tr>
<tr>
<td>Assess abnormal breath sound and report</td>
<td>27 41.5%</td>
<td>36 55.5%</td>
<td>02 3.0%</td>
<td>65</td>
</tr>
<tr>
<td>Psychological spurt</td>
<td>31 47.7%</td>
<td>34 52.3%</td>
<td>00 0%</td>
<td>65</td>
</tr>
<tr>
<td>Ensure propped up position</td>
<td>43 66.2%</td>
<td>21 32.3%</td>
<td>01 1.5%</td>
<td>65</td>
</tr>
</tbody>
</table>

Table (4.9): This table shows that (66.2%) of the study sample ensure the proper position of the patient, and (47.7%) of them perform Psychological support.
Table (4.10): Distribution of the study sample according to their performance regarding education.

<table>
<thead>
<tr>
<th>The nurses must be do health education to PT about</th>
<th>Done correctly</th>
<th>Done in correctly</th>
<th>Not Done</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>For activity intolerance</td>
<td>41</td>
<td>63.3%</td>
<td>24</td>
<td>36.7%</td>
</tr>
<tr>
<td>For positional complication</td>
<td>45</td>
<td>69.9%</td>
<td>20</td>
<td>30.1%</td>
</tr>
<tr>
<td>Discharge medical</td>
<td>37</td>
<td>56.7%</td>
<td>28</td>
<td>43.3%</td>
</tr>
<tr>
<td>Positional arrhythmia</td>
<td>34</td>
<td>52.2%</td>
<td>31</td>
<td>47.8%</td>
</tr>
</tbody>
</table>

Table (4.10): This table shows that (69.9%) of the study sample detected potential For positional complications of myocardial infraction, and (63.3%)of them give health education For activity intolerance.
Figure 4.1: Distribution of the study sample according to their years of experience

Figure 4.1 shows that (41.5%) of the study sample their years of experience ranged between 1-5 years.
Level of education:

Figure 4.1: Distribution of the study sample according to their Level of education

Figure 4.2: This figure shows that (43%) of the study sample were diploma degree, followed by (32.3%) the level of education were bachelor.
Discussion

Definition of be defined as developing of the heart muscles necrosis results form an acute interruption of blood supply to part of the heart. (Integrated Management of Cardiovascular Risk; WHO, 2002).

Training program about Myocardial infarction must be done. *Myocardial infarction (MI)* commonly known as a heart attack, is the interruption of blood supply to part of the heart, causing heart cells to die. This is most commonly due to occlusion (blockage) of a coronary artery following the rupture of a vulnerable atherosclerotic plaque.

12.5million of the estimated 32 million worldwide heart attacks are fatal (Integrated Management of Cardiovascular Risk ; WHO, 2002), 40-75% of all victims die before reaching hospital (Integrated Management of Cardiovascular Risk, WHO, 2002), 42% of women), and 24% of men die within a year of a heart attack in the US (The National Women’s Health Information Center, CDC). Deaths from Heart attack: 459,841 deaths in 1998 (NHLBI); 199,154 deaths for AMI reported in USA 1999 (NVSR Sep 2001). More than 250,000 die before they reach hospital (The British Heart Foundation, 2004). 50% wait more than 2 hours before getting help (The British Heart Foundation, 2004). The causes of Heart attack: 49% of cases caused by *high blood pressure* worldwide (WHO World Health Report, 2002) 3.3% of diabetic adults attending specialist diabetes services had a *heart attack* in Australia 2002 (Australia’s Health 2004, AIHW). This conducted from Ahamed Gassim Hospital cardiac, sugary and Renal transplant Center from May 2012 to September 2013.

Table 4.1: I selected one half (43.3%) of the study sample at ages ranged between (20-25) years followed by (64.4%) of the study sample were females then tow third (61.1%) of the study sample their Source of Knowledge from Colleagues while (6.2%) their knowledge from others sources. I believe that the future of development of nurses depended nurses female, and poor knowledge from other source.

Figure 4.1: shows that study one half (60%) sample their years of experience ranged between 1-5 years.

Figure 4.2. mention that one halve (43%) of the study sample diploma degree, followed by (32.3%) the level of education were bachelor, this is the same result finding of( Hager; H,2010—2011). Assessment of nurses knowledge about
rehabilitation of patient following myocardial infarction in coronary care unit – Ahmed Gasim Cardiac Surgery and Renal Translation Center. Results It was found the majority of participants (34%) had bachelor degree that in neelin university.

Table 4.2: this study revealed (69.9%) of the study sample responded with correct answers regarding Definitions of myocardial infarction this is similar result of Knowledge and attitude practice of myocardial infarction patients in general Khartoum hospital and in effects of education intervention in Khartoum stat and elshabb hospital 2011 show the result (67%) of the studies knowledge define of myocardial infarction, and only (52.3%) of them known the causes of Myocardial infarction in Khartoum of university.

Table 4.3: shows that about more than third quarter (78.8%).of the study sample responded with correct answers regarding Diagnosis of Myocardial infarction, while only (42%) of them know management of Myocardial infarction.

Table 4.4 emphasis of the study sample (30.7%) of the study sample responded Correctly answers regarding diet, while (63.3%) of them know Stress anxiety & relaxation. I think this poor result about information of health education of diet.

Table 4.5 show that third quarter (77%) of the study sample responded correctly regarding attitude of the nurse in emergency room, and (63.3%) of them responded correctly regarding care of patient with anxiety and fear from death (70.8%) of nurses agree about Myocardial infarction can be prevented by H.E there is good attitude.

Table 4.6: this table describe that (67.8%) of them agree about the nurses can contribute in diagnoses of Myocardial infarction beside (49.9%) of the sample agree provided psychological sport effective in medical treatment of M.I.

Table 4.7: this table selected that (63.%) of the study sample fex canlla correctly, and (61.5%) of sample performance E.C.G done correctly. (61.5%)of them responded correctly regarding Administer O2 correctly this is similar study finding in Khartoum of university Study the nursing care of patients with acute myocardial infarction in Omdurman hospital 2011.

show the result (62%) of the studies are good knowledge about O2 administer.

Table 4.8 this table show that the practical (46.6%) of sample done in correctly. I comment there is lake of nursing practices

Table 4.9: this table found that (66.2%) of the study sample ensure the proper position of the patient while (41.5%) of them perform done correctly. regarding
assess up normal birthing sound and report while (55.5%) of sample done in correctly. This lake performance.

Table 4.10: show practice of health education regarding inter venation of medical discharge found that (56.7%) done correctly beside (47.8%) not done correctly this milled knowledge of health education.
CHAPTER 5
Conclusion

- The researcher concluded that the nurses had adequate knowledge about the definition of myocardial infarction.
- Lack of source which depended on diploma degree in nursing care of myocardial infarction.
- Insufficient sources of knowledge about the other sources.
- Lack of information about diet to the patient regarding health education.
- There is poor in practice about assessment of location of patient with myocardial infarction.
- Concluded development of attitude of practice of administering O2 in Emergency room.
5-2 Recommendation

The study recommended log books design for nursing care of myocardial infraction should be available cardiac or myocardial infraction unite.

The study recommend this disease myocardial infraction must receive more health attention and efforts to define the participating risk factors should be undertaken.

The study recommend to provide the proper nursing care for patient with myocardial infraction.
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Appendix
Questioner to Assess Nurses' Knowledge, Attitude and Practice regarding Myocardial Infraction patients' care, Cardiac Surgery and Renal Transplantation center at Ahmed Gasim Hospital, Khartoum State, Sudan (2013).

1-Age
1-- 20 - 25 years ( ) 2-- 26 - 30 years ( )
3-- 31 ---- 35 years ( ) 4-- 36 or more years ( )

2- Gender :- Meal ( ) female ( )

3- level of Education :-
1- secondert school ( ) 2- Diploma ( ) 3 bachelor ( ) 4- post graduate ( )

4- years of Experience:-
1- less than one years ( ) 2- 1-- 5 year( ) 3- 6- 10 years ( ) 4- up to 10 years ( )

5- Sours of Knowledge
1- Colleague ( ) 2- Internet ( ) 3- Other ( )

Nurses knowledge Regarding M.I:-

5- What is myocardial infraction:
a- means that part of the heart muscle loss it’s the blood supply ( )
b- It’s called heart attack ( )
c- It’s disorder called acute coronary artery ( )
d- infraction means each of some tissues due to a locked artery which stop blood from getting past ( )

6- Types of myocardial infraction:
A- STEMI ( ) b- NSTEMI ( ) c- non of above ( )
d- other ( )

7- Couses of myocardial infraction :-
a- Atherosclerosis ( )
b- collection of cholesterol are deposited in the walls of artery ( )
c- Arteries that are narrowed by some causes ( )
d- Heart attack rates are higher in association with tissue exertion psychological or physical exertion ( )

8- Risk factor of myocardial infraction:-
a- Tobacco smoking ( )
b- Hypercholesterolemia ( )
c- High blood pressure ( )
d- Obesity ( )
e- Family history of ischemic heart disease

a- Radiated most often to the left arm ( )
b- Radiated to the lower jaw neck & right arm ( )
j- diabetic ( )
f- Stress ( )
g- Alcohol ( )
h- Male are more at risk than females ( )

9- Main sign & symptom of a heart attack ( chest pain)
c- May radiated to back & epigastric ( )
d- Sweating ( )
e- Dyspnea ( )
f- Palpitation ( )
10-the Diagnoses of myocardial infraction:-
a- Electrocardiogram (ECG) ( ) b-Coronary angiogram (d-Echocardiogram are also suggestive myocardial infraction ( )

11- Prevention the risk of recurrent myocardial infraction decreases with:
   a-blood pressure management ( ) b-life style change ( ) c-smoking cessation ( )
   d-Limitation of alcohol intake ( ) e-Antiplatelet drug therapy as aspirin ( )
   f-Beta booker therapy such as carvedilol ( )

12-Management of myocardial infraction:-
a-Oxygen ( ) b-aspirin ( ) c-nitroglycerin ( ) d-thrombolysis ( )
   d-All the above ( )

13- Complication of myocardial infraction ;-
a-Congestive heart failure ( ) b- Myocardial rupture ( ) c- Arrhythmia ( )
   d-Precarditis ( ) e-Cardiogenic shock ( ) f- Others ( )

14- this items must be included in health education about life style of M-I patient :
a-stop smoking ( ) b- avoid alcohol intake ( ) c-regular exercise is advised for most people ( ) d-Wight management ( ) e-Blood pressure less than 140/90 mmHg ( )

15-Health education information & recommendation about diet for M-I P.T following
a-Eat at less five portion of variety fruit & vegetables ( ) b- Reduce you salt intake ( )
   c-Eating foot that are high in unsaturated fat can help to reduce cholesterol level ( oily fish ) ( )
   d- All the above ( )

16- Health educating, information about work issues include the following :
a-Following an M.I, most people can go back to work with in 2—3 minutes ( ).
b-Some people who have a small M.I & feel well go back sooner ( )
c-Some people may be able to go back to work ( )
   d- Office jobs are often better for the heart than some physical jobs ( )

17-Health education information about driving & flying issues as following :
a-Patient should not drive for at least four week after an M.I ( )
b-Patient should not drive at last six weeks after an M.I (  )
c-patient should not drive until the angina is well controlled (  )
d- Patient can usually fly as passenger within two to three weeks of a M.I without complication (  )
e-Patient can usually fly as passenger within five to six weeks of a M.I without complication (  )

18-Health education, information & Recommendation about stress anxiety & relaxation include:
a-Being stressed & anxious can make patient feel generally unwell in himself (    ).
b-Positively relax through the two main ways to positively relax that is muscular exercises and deep breathing exercises (    ).c -Tell the doctor if you feel that you have become over anxious (    )
d-ALL the above (    )

19-Health education, information & Recommendation about sexual include the following:
a-For a few weeks is it is probably best avoided (    ).
b-If the patient able to walk without discomfort, then a return to sexual relationships should note cause any problem (    ).
c-Erectile dysfunction can be caused by emotional stress (    ).
d-Erectile dysfunction can be caused by medication such as beta-blocker (    ).

20-The nurses in medical car to take an action as nursing intervention they well:
a-Collecting data (history) (    ) b-physical examination (    ).
C-priority nursing car plan according to patients condition (    )d. All the above (    )

21-If the M.I patient admitted to the emergency room the nursing intervention include the following:
a-Fix cannula (    ) b- ECG (    ). c-Administer O2 with semi.fowlers position (    ).
d-Monitor vital signs (    ). e-all the above (    )

NURSING ATTITUDE REGARDING MYOCARDIC INFARCTIN PATIENT CARE:
22-do you think that M.I knowledge essential for nurse who working in CCU ?
a-strong agree (    ) b-agree (    ) c-not agree (    )
23-Do you think that M.I can be prevented through health education & practices health life style?
   a-strong agree (    )  b-agree (     )  c-not agree (     )  d-strong not agree (    ).
24-Do you think that provide psychological support for M.I patient can effective their medical condition?
   a-strong agree (    )  b-agree (    )  c-not agree (     )  d-strong not agree (    ).
25-Do you think that the nurse can contribute in diagnosis & reapplication of M.I patient?
   a-strong agree (    )  b-agree (    )  c-not agree (     )  d-strong not agree (    ).
26-Nusing plan for chest discomfort (pain) due to an imbalance oxygen include the following:
   a-Assess the severity, location & duration of pain (report    )           (    )
   b-Administer O2 with semi. Fowlers position (     )
   c-Obtain a 12 lead ECG during pain (     )  d-Monitor vital signs (     ).
   e-Administer nitroglycerine (    )
   g-Ensure rest & sleep, provide comfortable environment (    )
27-Nurse care plan for respiratory difficulties (dyspnoea) include the following:
   a-Assess for any dyspnoea, abnormal breath sound (report) (     )
   b-Ensure propped up position, rest & comfort (     )
   c-Administer O2 & drug as ordered (     )  d-psychological support, give liquid diet (    )
28-Nursing care plan for anxiety & fear of death include the following:
   a-Encourage patient & family to express fear or anxiety by interest listening caring (    )
   b-Explain the procedures being done on him (     )
   c-psychological support (     ).
   d-Administer anti-anxiety drug as order (     ) e-All the above (     )
29-Nursing care plan for potential complication of thrombolytic Therapy include the following:
   a-Watch for sign & symptom of bleeding, arrhythmias etc (     )
   b-Fix cannula for I.V medication & blood collection (     )
c-Monitor bleeding time ( ) d-Protect patient from any injury ( )
e-keep anticoagulant antidote ready ( ) f-Monitor vital signs ( )

30-Nursing care plan for discharge medication, follow up & health teaching include the following:

a-Explain the name, purpose, side effect of medicine ( )
b-Ask for regular follow up & continuing medication at home ( )
c-Teach about management of chest pain at home ( )
d-Explain diet to avoid large meals, rest after meals ( )
e-Ask to seek immediate medical aid if chest pain not relieved after taking GTN and rest ( )

31-Nursing care plan for potential arrhythmias related to decrease cardiac output include:

a-Monitor cardiac rate rhythm & conduction (report any changes ( )
b-Observe vital sign, ECG, urine output, skin color, temperature ( )
c-Promote physical, mental rest & comfort ( )
d-Keep anti-arrhythmic drugs & defibrillator ready ( )
Observation check list for monitoring nurses performance during care of patients with myocardial infarction.

<table>
<thead>
<tr>
<th>Nursing care provided</th>
<th>Done correctly complete</th>
<th>Done correctly in complete</th>
<th>Done incorrect</th>
<th>Not done</th>
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<td><strong>1.thenursingintervention in emergency room:</strong></td>
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<td>a-fix cannula</td>
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<td>b-ECG</td>
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<td>c-Administer O2</td>
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<td>d-Monitor vital signs</td>
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<td><strong>2-Nursing care plan for chest pain</strong></td>
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<td>a-Asses the location &amp; duration of pain</td>
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<td>b- Administer O2</td>
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<td>C-obtain a 12lead during pain</td>
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<td>d-monitor vital signs</td>
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<td>e-Administer nitroglycerine &amp; narcotic analgesic as order</td>
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<td><strong>3-Nursing care plan for (dyspnoea)</strong></td>
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<td>a-Asses for any abnormal breast sound (report)</td>
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<td>b-Ensure propped up position rest &amp; comfort</td>
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<td>c-Administer O2 &amp; drug as order</td>
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<td>d- psychological support , give liquid diet</td>
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<td><strong>4- ( N.C ) plan for anxiety &amp; fear for death</strong></td>
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<td>a-Ensure PT &amp; family to express fear &amp; anxiety by interest, listing, caring</td>
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<td>b-Explain the procedures being done on him</td>
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<td>c- Administer anti-anxiety as order</td>
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<td>d-psychological support</td>
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<td><strong>5-Nursing care plan for activity intolerance</strong></td>
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<td>a-to decrease O2 consumption</td>
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<td>b-Give liquid diet</td>
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<td>c-Watch for dyspnoea, chest pain during activity</td>
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<td>d-Administer O2 as needed</td>
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<td><strong>6o -Nursing care plan for potential complications of thrombolytic therapy</strong></td>
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<td>a-Watch sign &amp; symptom of bleeding arrhythmia etc</td>
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<td>b-fix cannula for IV medication &amp; blood</td>
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<td>c-protect PT from any injury</td>
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<td>d-Monitor bleeding time &amp; coagulation profile</td>
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<td>e-Keep anti coagulant antidote ready</td>
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<td>f-Monitor vital signs</td>
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7-Nursing care plan for discharge medication, follow up & health teaching side |
| a-Explain name, purpose & side effect of each drug |
| b-Ask for regular follow up & continuing medication at home |
| c-Explain diet to avoid large meals, rest after meals |
| d-Teach about management of chest pain at home |
| e-Ask to seek medication medical aid if chest pain not relieved after taking GTN & rest |

8-Nursing care plan for potential arrhythmias; |
| a-Monitor cardiac rate & rhythm |
| b-Observe vital sign, ECG & skin color |
| c-Promote physical & mental rest & comfort |
| d-Keep anti-arrhythmic drugs & defibrillator ready |