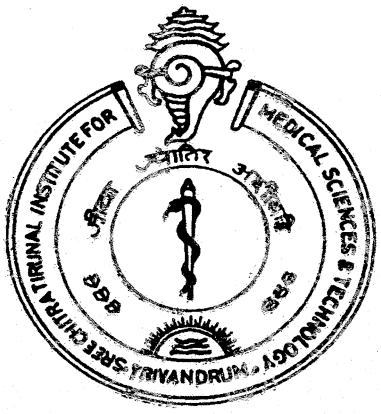
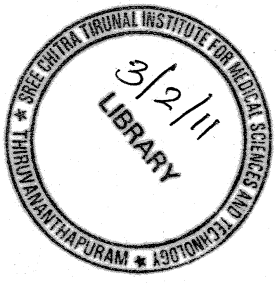
A STUDY TO ASSESS KNOWLEDGE ABOUT SELECTED CARDIOVASCULAR DRUGS AMONG CARDIAC NURSES





Project Report

Submitted in partial fulfillment of the requirements

for the

Diploma in Cardiavascular and Thoracic Nursing

By

ANUPRIYA.P.S.

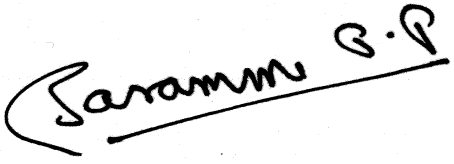
Code NO. 6058

Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum

2010

CERTIFICATE FROM SUPERVISORY GUIDE

This is certified that Mrs **ANUPRIYA. P.S** has completed the project work on **"A STUDY TO ASSESS KNOWLEDGE ABOUT SELECTED CARDIOVASCULAR DRUGS AMONG CARDIAC NURSES"** in CMICU and CSICU at SCTIMST, Trivandrum under my direct supervision for the partial fulfillment for the Diploma in cardiac nursing in the University of Sree Chitra Tirunal institute for medical Sciences and Technology. It is also certified that no part of this report has been included in any other thesis for processing any other degree by the candidate.



Dr. Saramma.P.P
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November 2010

CERTIFICATE FROM THE CANDIDATE

This is to certify that the project on **"A STUDY TO ASSESS THE KNOWLEDGE ABOUT SELECTED CARDIOVASCULAR DRUGS AMONG CARDIAC NURSES"** In CMICU and CSICU at SCTIMST , Trivandrum is a genuine work by me, under the guidance of **Dr. Saramma.P.P,** PhD, senior Lecturer in nursing, SCTIMST, Trivandrum. It is also certified that this work has not been presented previously to any other university for award of degree, diploma or other recognition.

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November 2010

APPROVAL SHEET

This is to certify that **Mrs. ANUPRIYA.P.S** bearing code no: 6058, has been admitted to the Diploma in Cardiac nursing, in January 2010 and she has undertaken the project entitled, "**A STUDY TO ASSESS THE KNOWLEDGE ABOUT SELECTED CARDIOVASCULAR DRUGS AMONG CARDIAC NURSES"** in CMICU and CSICU of SCTIMST , Trivandrum, which is approved for the Diploma in Cardiac nursing , awarded by the Sree Chitra Tirunal Institute for Medical sciences and Technology, Trivandrum and it is found satisfactory.

EXAMINERS

(1).....

(2) .....

GUIDE

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Thiruvananthapuram
November 2010

ACKNOWLEDGEMENT

Investigator owes sincere thanks to God Almighty, who accompanied and directed her to achieve success throughout this study.

The present study has been completed under the expert guidance of **Dr. Saramma.P.P,** Senior Lecturer in Nursing, SCTIMST, Trivandrum. Investigator express her sincere gratitude to **Dr. Saramma .P.P**, for the valuable guidance, constant support and encouragement given for the completion of the study.

The researcher expresses her sincere thanks to **Dr.A.V.George,** Registrar, SCTIMST, Trivandrum, for giving this opportunity for conducting this study.

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ABSTRACT

Topic : A study to assess the knowledge about selected cardiovascular drugs among cardiac nurses.

Nurses are responsible for preparing and administering potent drugs that affects the patients cardiovascular functions. Nurses must know proper diluents of each drug and they should be expert in calculating the dose of medication to prevent errors. Each nurse should be aware of indication, action, contraindications, adverse reactions and interactions of drug. OBJECTIVES: (1) To identify the knowledge about selected cardiovascular drugs among cardiac nurses, (2) To identify the relationship between the knowledge about selected cardiovascular drugs among cardiac nurses and selected variables. METHODS: Forty cardiac nurses were purposely selected from CSICU and CMICU of Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Convenient sampling technique was used for selecting the sample. Total period of study was from August 2010 to October 2010. A self prepared questionnaire was used in the form of multiple choices. RESULTS: Studies showed that cardiac nurses knowledge on selected cardiovascular drugs is above average(10.75 /15). There was no statistically significant difference the mean knowledge score and age, year of experience, place of work and CPCR training programme attended. CONCLUSION : Based on the findings of the study Cardiac nurses have above average knowledge about selected cardiovascular drugs and about flow rate calculations.

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LIST OF ABBREVATIONS

CMICU - Cardiac Medical Intensive Care unit

CSICU - Cardiac Surgical Intensive Care Units

SCTIMST - Sree Chitra Tirunal Institute for Medical Sciences and Technology

PICU - Paediatric Intensive Care Unit

NICU - Neonatal Intensive Care Unit

ED - Emergency Department

CHAPTER -1

1.1 INTRODUCTION

Cardiovascular disease is the leading cause of mortality and morbidity in many countries world wide. Mortality from cardiovascular disease reached 17.5 million in 2005, which is 30% of all global death (Wood, 2005). The World Health Organization estimated that if no appropriate action is taken, 20 million people would die from cardiovascular disease every year by 2015(Okrainee, 2007). One person dies every 30 seconds from heart disease, over 2600 people every single day. Drug that affect the function of heart and blood vessel are among the most widely used medicine. These drugs may exert their primary effect either on the blood vessel or on the heart itself (Webster, 2007). Medication safety is a major concern and global issue related to the quality and safety of patient care (Sheu, et al 2007).Research findings warn that more than half of life threatening errors are related to rapid infusion of high alert medications(Glandstone,1995). Many recommended practices have been proposed to decrease medication errors, including avoiding mistakes by storing high alert medications in specific ways (Cohen,2007). From an educational point of view lack of

pharmacology teaching and a theory - practice gap lead nurses to make administration errors (Stifter, et al 1991). It is claimed that more than one million medical mishaps happened each year causing 100000 patients death. Death caused by medical errors were between 44000 and 98000 even greater than the number of U.S Death caused by vehicle accidents, AIDS, and Breast cancer (kohn, et al 1999). The infusion nurse specialist need to have knowledge and skills necessary to recognize and respond appropriately, when anaphylaxis occurs(Scarlet, 2006). Nurse's insufficient drug calculation skills contribute to 1.5 – 4.9% of error rate in infusion preparation task (Parshuram, et al 2008). Research has demonstrated that an educational programme can raise nurse's awareness about medication errors and other medication related safety issues (Elnour, et al 2008).

1. 2. BACKGROUND

1.2.1 Cardiovascular drugs

The variety and scope of cardiovascular drugs have increased tremendously in the past few decades, and new drugs are being approved annually. In the 1950s, effective oral diuretics became available. These drugs dramatically changed the treatment of heart failure and

hypertension. In the mid-1960s a class of agents called beta blockers was discovered, this led to major changes in physicians ability to treat patients with hypertension or angina pectoris. Calcium channel blockers and ACE inhibitors became widely used in the 1980s, and they too have allowed patients with hypertension, heart failure, and coronary artery disease to be treated more effectively. The development and use of thrombolytics, have revolutionized our ability to treat patients having a heart attack.

Types of cardiovascular drugs may be broken into groups depending upon their action or what they treat. Treatment categories are more difficult to describe since many of these medications may address several symptoms of heart disease and have more than one use. Categories that might describe drug actions include the following: statins, diuretics, anticoagulants, anti-platelet, beta-blockers, digitalis drugs, vasodilators, calcium channel blockers, and ACE inhibitors, fibrinolytics, antiarrhythmics, inotropic agents, and phosphodiesterase III inhibitors.

Statins

Cholesterol reduction is an important part of therapy for patients with cardiovascular diseases. The pharmachological management of hyperlipidemia decreases morbidity and mortality from coronary heart

disease. The primary target of anti hyperlipidemic therapy is to reduce LDL cholesterol.

Eg : Atorvastatin and Lovastatin.

Diuretics

Are cardiovascular drugs that help to reduce fluid retention. These may also reduce blood pressure, though they usually aren't first line blood pressure medications. When the body is retaining fluid, can often make the heart work harder, and the intent with using diuretics is to reduce heart workload.

Eg: Furosemide , Spironolactone.

Anticoagulants

Anticoagulants such as Unfractionated heparin, Low molecular weight heparin, Direct thrombin inhibitors and Warfarin limit fibrin formation and helps to prevent thromboembolism. It lengthen the time taken for blood to clot, which can help prevent formation of blood clots that might cause stroke. People who have artificial valves and who have had a stroke, may need an anticoagulant like warfarin to minimize future risk.

Anti-platelet

Aspirin the most widely used platelet inhibitor, which inhibit thromboxane A2, a platelet agonist and prevent thrombus formation and arterial vasoconstriction . Aspirin is used to decrease mortality of patients with acute myocardial infarction.

Beta Blockers

They may help control blood pressure, slow fast arrhythmias, and reduce chest pain associated with angina. The various beta-blockers result in a slower heartbeat that may help to control numerous heart disease symptoms and which may reduce future risk of heart attack.

Eg: Atenolol, Metoprolol.

Digitalis

Medications with digitalis stimulate the heart to beat more forcefully. Some people with arrhythmias may require this medication, and other times it is used when a person is in congestive heart failure. Digoxin is a mild positive inotrop with antidysrrhythmic and bradycardiac action. Digoxin activate parasympathetic system causing a decreased heart rate and increased AV nodal inhibition. Digoxin is primarly indicated for patients with heart failure and chronic atrial fibrillation.

Inotropes

Inotropic drugs are used to increase the force of myocardial contraction and cardiac output, which include sympathomimetics such as Dopamine, Dobutamine, Epinephrine, Isoproterenol and Phosphodiesterase inhibitors inamrinone and milrinone. These drugs are commonly given to patients with ventricular dysfunction and cardiogenic shock.

Vasodilators

Vasodialators decrease the preload and afterload which reduce the work of the heart and they are often prescribed to treat chest pain resulting from angina eg : Nitrates, which cause peripheral vasodialation and reduce venous return to the heart. Nitroprusside, it is a potent arterial and venous vasodialator that is used to treat severe left ventricular heart failure, hypertension after CABG, dissecting aneurysm.\

Calcium Channel Blockers

Calcium channel blockers are another group of cardiovascular drugs useful in the treatment of some forms of angina, and may also be prescribed to treat certain arrhythmias or high blood pressure.

Eg : Nifedipine, Amlodipine.

ACE (Angiotensin-converting enzymes) Inhibitors

ACE inhibitors are indicated to treat heart failure, hypertension, acute myocardial infarction with or without left ventricular dysfunction. ACE inhibitors block conversion of Angiotensin I to the potent vasoconstrictor Angiotensin II, reduce Aldosterone synthesis and may promote fibrinolysis.

Eg : Captopril, Enlapril.

1.2.2 Nurses in Sree Chitra Tirunal Institute for Medical Sciences and Technology

SCTIMST is a tertiary level referral hospital. Nurses in SCTIMST regularly engage in activities promoting the healthcare of patients. Nurses carry out in - service education programme to improve their professional competency and knowledge. Nurses carry out health education programme for patients and their relatives.

SCTIMST conducts diploma courses in Cardiac and Neuro nursing. Every year 20 new students are getting admitted to the course. Senior nurses should be competent enough to train and supervise the junior nurses and student nurses.

1.2.3 Nurses responsibilities in administration of highly alert medications

To ensure safe medication administration the nurse should be aware of a nursing standard called six right of medication administration which includes right medication, right dose, right client, right route, right time, right documentation. Report all medication errors that do and do not harm patients. Understanding potential errors or near misses may provide key information on how medication errors as a whole can be prevented. Nurses working in an environment where individuals are punished for making mistakes will discourage error reporting and encourage hiding mistakes, ultimately making it difficult to identify errors and to prevent them from happening.

Know the medication before administering. Lack of drug knowledge and lack of important patient information cause medication errors. Regardless of what is ordered, nurses need to be able to recognize when a prescribed dose of a medication is too high. More education and experience are associated with improved patient safety. When administering medications, nurses are accountable for knowing why the medication is being used, what possible side effects are to be monitored.

Nurses should take several practical steps to improve medication safety

a) Confirm patient information before administering medications.

Double-check the patients name, known allergies, and previous medication use. Make sure that the most recent weight was used in calculating the medication.

b) Double check and collaborate with other clinicians to verify information.

Handwritten orders and verbal orders can lead to errors and are likely responsible for total overdoses. If an order is illegible or unclear the medication should not be given until after the nurse seeks and obtains clarification from the prescriber.

c) Minimize distractions during medication administration.

Distractions during the process of medication administration interfere with concentration and may lead to errors. The inability to concentrate on the medication administration process and feeling rushed during medication administration can lead to errors.

d) Improve communication during transitioning and handoffs.

Handling off a patient from one clinician to another can also be a time when patient safety errors can occur. Although much of the information may eventually be written, handoffs almost occur via verbal communication. Using written communication and reading back all orders are both ways to decrease these communication slips.

1.3 NEED AND SIGNIFICANCE OF THE STUDY:-

Patient safety is increasingly recognized as essential in the practice of intensive care medicine. Patients in intensive care unit require high intensity care and may be at high risk for iatrogenic injury. Individual have right to safe and effective quality health care.

Cardiac nursing is a nursing specialty that work with patient who suffer various conditions of cardiovascular system, such as Unstable angina, Cardiomyopathy, Coronary artery disease, Congestive heart failure, Myocardial infarction, Cardiac dysarrhythmias and congenital heart diseases. Cardiac nurses must assess and care for patients with heart problems that range in severity from arrhythmias to Heart transplants. Nurses must be able to immediately assist in treating or initially diagnosing a sudden life threatening emergency. Cardiac nurses monitor

patient for any negative signs of a change in condition, administer medication, help with basic personal care needs and work with the cardiologist to develop a plan of action for patients care. Cardiac nurse must acquire specialized skills, including ECG monitoring, Defibrillation, and medication administration by continuous intra venous drip.

Cardiac nurses are responsible for preparing and administering potent drugs that affects the patients cardiovascular functions. Nurse must know proper diluents of each drug and they should be expert in calculating the dose of medication to prevent errors. Each nurse should be aware of indication, action, contraindications, adverse reactions and interactions of drug.

The investigators experience in Cardiac Surgical Intensive Care Unit in Sree Chitra Tirunal Institute for Medical Sciences and Technology, showed that the newly joined nurses have not much knowledge about the action of various Inotropes with changing dosage. Hence the investigator planned to conduct a study to assess the knowledge of staff nurses on selected cardiovascular drugs.

1.4 STATEMENT OF THE PROBLEM:-

"A study to assess knowledge about selected cardiovascular drugs among cardiac nurses".

1.5 OBJECTIVES:-

The objectives of this study are:-

1. To identify knowledge about selected cardiovascular drugs among cardiac nurses.

2. Find out the relationship between knowledge about selected cardiovascular drugs and selected variables

1.6 OPERATIONAL DEFINITIONS:-

Knowledge:- A state of awareness or understanding with conscious mind. In this study the investigator assesses the knowledge on selected cardiovascular drugs among cardiac nurses using a self prepared validated knowledge test.

Cariac nurses:- It means permanent and temporary staff nurses working in cardiac medical intensive care unit and cardiac surgical intensive care units.

Cardiovascular drugs:- agents that affect rate or integrity of cardiac contraction, blood vessel diameter, or blood volume. Investigator conducted study on selected cardiovascular drugs, which include, Adenosine, Amiodarone, Digoxin, Dopamine, Captopril, Heparin, Metoprolol, Milrinone, Nitroglycerine, Spironolactone, Warfarin.

1.7 METHODOLOGY:-

This is a descriptive survey of nursing staff. The investigator first assesses the knowledge about selected cardiovascular drugs among cardiac nurses with a self prepared questionnaire. The total duration of assessment is 10 minutes. Fifty nursing staff will be selected for the study. The duration of study is from August - October.

1.8 DELIMITATION:-

This study limited to nursing staff working in cardiac surgical intensive care unit and cardiac medical intensive care unit in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

1.9 ORGANISATION OF THE REPORT:-

The report is divided in to five chapters. The first chapter is the introduction. In this chapter the background of the study is outlined, the

subject assessing the nurses knowledge about selected cardiovascular drugs, nurses responsibilities during medication administration is briefed, the need and significance of research problem stressed, and problem and objectives are stated. An attempt is made to operationally define the terms so as to clarify a brief discussion on methodology adopted for the study. The delimitations are specified.

CHAPTER - 2

REVIEW OF LITERATURE

2.1 Studies related to assessment of nurses knowledge on medication administration

Stifter, et al (1991),conducted a study to assess the effects of an educational program designed to improve nurses' knowledge of the use of emergency medications in the pediatric intensive-care unit (PICU) are reported. The clinical pharmacist for a six-bed PICU and a clinical nurse educator developed a program to assess and extend PICU nurse's knowledge of emergency medications with respect to calculations of bolus and continuous infusions, pharmacology, and proper dosage and administration route. The program consisted of a pretest, a pharmacology lecture, calculation problems, a hands-on practicum, and a posttest. Drugs covered were atropine sulfate, sodium bicarbonate, calcium gluconate, calcium chloride, dopamine hydrochloride, dobutamine hydrochloride, epinephrine hydrochloride, isoproterenol hydrochloride, lidocaine hydrochloride, sodium nitroprusside, and norepinephrine bitartrate. A retest was given 13 months after the pretest. The program was completed by 21 nurses over seven months. There was a significant difference

between the mean pretest score, 69.5%, and the mean posttest score, 87.3%, due to improvements in scores for the calculation questions. A significant correlation was observed between pretest score and months spent practicing in the PICU. Time to take the retest was significantly shorter than the posttest time, and scores continued to improve. An educational program developed cooperatively by pharmacy and nursing improved specific measures of PICU nurses' knowledge of emergency drugs.

Altun, et al (2010). Conducted a study to determine if a structured workshop on best practice technique for the administration of injection for the nurses results in an improvement in knowledge on the subject. Nurses attended an interactive lecture based workshop on best practice technique for the administration of injections. The participants completed a multiple choice question test derived from topics covered in this presentation prior to the lecture. The multiple choice question was repeated after the lecture to assess retention and application of knowledge. 38 nurses participated in the workshop. There was a significant improvement in the mean test scores after the lecture when compared with pre lecture scores (Mean=16.5, SD=3.7 vs Mean=7.8, SD=1.9, $p< 0.001$). Lecture based practice technique of administration of

injections helped to improve nurses knowledge and helped to overcome deficiencies in nurses training.

Schreiber, et al (2007) conducted an evidence based practice project to decrease adverse patient events related to the use of cardiac medications on a post-operative orthopedic units and also to determine and implement the best nursing practices for safe cardiac medication administration to this patient's population. An education programme was developed based on best practices for safe administration of cardio vascular medications and medication cognitive aids were made available to the nursing staff. Nurse's knowledge was measured using a pre and post-test assessment. Post-test was repeated after two weeks to assess knowledge retention. Almost half of the RNs received education in service. Pre-test survey of medication administration practices showed wide inconsistency in practice specifically nursing action. Post test scores for 23 RN averaged 92%, only 9 RN's completed the repeated post-test. They scored a 94% of retention rate. The study concluded that nursing staff require continuous education programme to prevent adverse drug events.

Hajebi, et al (2010), performed a study to determine the knowledge, attitude and practice of nurses towards pharmacovigilance in the taleqani

medical teaching and treatment centre in Tehran before and after an adverse drug reaction education programme. This study was conducted using a questionnaire through two steps. In every step 150 questionnaire were distributed in various wards of the taleqani hospital. According to the statistical result the knowledge of nurses before the seminar was significantly less than the knowledge after the seminar (P= 0.0001), but there was no significant effect on the attitude (p=0.05). Based on the results of this study, it is necessary to conduct continuous adverse drug reaction educational programme until voluntary monitoring of adverse drug reaction become conventional and habitual among nursing staff.

Oshikoya, et al (2008), conducted a study to determine adequacy of knowledge of skills of drug dose calculations in children acquired by medical students during their clinical attachment in paediatrics. Fifty two 5th year medical students of the the Lagos state university college of medicine, were examined on drug dose calculation from a vial and ampoules of injections syrup and suspensions, and tablet formulation. The examination was with a structured questionnaire. Thirty-six (69.2%) and Thirty (57.7%) students were taught drug dose calculation in neonatal posting and during ward rounds or bed side teaching. Less than 50% of the students were able to calculate the correct doses of each of

Adrenaline, gentamycin, chloroquine and sodium bi carbonate injection required by the patients. The dose calculation was relatively better with adrenaline when compared with the other injections. The proportion of female students that calculated the correct doses of quinine syrup and cefuroxime and suspension where significantly higher than dose of their male counterparts. The study concluded that medical students lacked the basic knowledge of pediatric drug dose calculation but were willing to learn if the topic was formally taught.

Stewart, et al (2010), performed a study to evaluate knowledge, core competencies, communication and team working skills in paediatric drugs prescribing and administration at under graduate level. The practical, ward based workshop was delivered to fourth year medical and third year nursing students in B.M.C medical education and evaluated using a pre and post work shop questionnaire with open ended response questions. Following the work shop students reported an increase in their knowledge and awareness of paediatric medication safety and the causes of medication errors ($p < 0.001$), with the greatest increase noted among medical students. Highly significant changes in student's attitude to shared learning were observed indicating that safe medication practice is learned more effective with students from other health care disciplines.

Qualitative data revealed that student's participation in the work shop improved communication and team work skills and led to greater awareness of the role of other health care professionals. Study had helped to bridge the knowledge skill gap demonstrating how an interprofessional approach to drug prescribing and administration has the potential to improve quality and safety with in health care

Hsaio, et al (2009), performed a study about the development and validation of an instrument to measure nurse's knowledge of high-alert medications and to analyse known administration errors. A cross-sectional study was conducted in 2006 in Taiwan using a questionnaire developed from literature review and expert input, and validated by subject experts and two pilot studies. Section 1 of the questionnaire (20 true-false questions) evaluated nurse's knowledge of high-alert medications and section 2 was designed to analyse known administration errors. Snowball sampling and descriptive statistics were used. A total of 305 nurses participated, giving a 79·2% response rate (305/385). The correct answer rate for section 1 was 56·5%, and nurse's working experience contributed to scores. Only 3·6% of nurses considered themselves to have sufficient knowledge about high-alert medications, 84·6% hoped to gain more training, and the leading obstacle reported was

insufficient knowledge (75·4%). A total of 184 known administration errors were identified, including wrong drug (33·7%) and wrong dose (32·6%). Evidence-based results strongly suggested that nurses have insufficient knowledge about high-alert medications and could benefit from additional education, particularly associated with intravenous bolus administration of high-alert medications.

2.2 studies related to medication errors:-

Intravenous medication errors are frequent events. They are associated with considerable harm, but little is known about their causes. The common errors in drug administration include poor hand writing of prescriptions, staffing failing to follow policy and poor communication (Upton, 2001).

Jain, et al (2009), Conducted a study about the medication errors of ordering, dispensing and administering in neonates admitted for emergency care and to compare the errors occurring in the emergency department with those occurring in the neonatal intensive care unit of a teaching hospital in North India. A retrospective chart review of neonatal prescriptions written in the 4 months from January to April 2004 in the neonatal intensive care unit and the pediatric emergency department was

done. A total of 821 prescriptions were analyzed and 81 (9.6%) errors were detected. The error rate was found to be 1.5 (54/38) and 0.7 (27/38) per patient in ED and NICU, respectively, being highly significant in ED. Every tenth prescription had medication error in ordering or dispensing; of this, every sixth prescription in ED and nineteenth prescription in NICU had medication error. Dosing errors were the commonest form of detected errors.

Parshuram, et al (2004), conducted a study to characterise the incidence and nature of medication errors during paediatric resuscitations in emergency department of a tertiary paediatric hospital. Teams that included a clinician who commonly leads "real" resuscitations, at least two assisting physicians, and two or three paediatric nurses. The teams conducted eight mock resuscitations, including ordering medications. Exercises were videotaped and drugs ordered and administered during the resuscitation were recorded. Syringes and drugs prepared during the resuscitation were collected and analysed for concentrations and actual amounts. Participants gave 125 orders for medications. In 21 (17%) of the orders the exact dose was not specified. Nine dosing errors occurred during the ordering phase. Of these errors, five were intercepted before the drug reached the patient. Four 10-fold errors were identified. In nine

(16%) out of 58 syringes analysed, measured drug concentrations showed a deviation of at least 20% from the ordered dose. A large deviation (at least 50%) from the expected dose was found in four (7%) cases. Medication errors commonly occur during all stages of paediatric resuscitation. Many errors could be detected only by analysing syringe content, suggesting that such errors may be a major source of morbidity and mortality in resuscitated children.

Nazari, et al (2005), performed a study to evaluate the pharmacokinetic interactions in patients hospitalized in an ICU of a teaching hospital in Tehran, Iran. A questionnaire was designed and used to collect study data. Overall information extracted from 567 ICU prescriptions from March 2005 to December 2005. The extent of occurrence and frequency of potential pharmacokinetic interactions were categorized based on the reference text Drug Interactions Facts. There were 413 pharmacokinetic interactions in 567 studied prescriptions, which were divided into 64 types of pharmacokinetic interactions. The most observed interaction was between ciprofloxacin and sucralfate. Mechanisms of the pharmacokinetic interactions were related to metabolism (60.05%), absorption (38.26%), elimination (0.97%) and distribution (0.73%). There was a direct relationship between the number

of drugs per prescription and the frequency of pharmacokinetic interactions ($p<0.001$, $r=0.98$). Findings revealed that there was a significant number of rapid occurring, moderate, probable and definite interactions among the ICU prescriptions.

Conroy, et al (2008), aimed to identify educational interventions to reduce dose calculation errors. Literature review, questionnaire survey of paediatric healthcare professionals, observation and interviews were performed. Literature review identified one paper describing an in-service test for medical trainees. 319/559 questionnaires were returned (57%). 34 mentioned educational interventions. 15 centres provided further information on teaching assessment methods. 13 delivered presentations usually at doctor's induction. Many had a similar format including differences to adult prescribing; common errors and how to calculate doses. Paediatric clinical pharmacists play a significant role in delivering training competency assessment. Teaching of paediatric prescribing takes place mostly in the format of lectures during doctor's induction. Few centres assess competency. No validated tool existed. There had been little evaluation of the impact of teaching on competency to prescribe.

Mohamed and Gabr (2010), aimed to assess nurses' views on the factors contributing to medication errors and suggestions of facilitating improvements to control medication administration errors in intensive care units. A cross-sectional direct-observational study was conducted in all surgical intensive care units at Emergency University Hospital. Twenty six nurses working in the two surgical intensive care study units with a minimum of one year experience in the work setting were included in the study. And, all patients receiving medications observed. Two tools for quality improvement were employed; Observation sheet for the Medication administration Process (flow chart) and The Affinity Chart. Based on the study findings of this study, it could be concluded that nurses' medication administration process (transcription, preparation,) is generally inadequate.

Leyton, et al (2008), assessed the prevalence and characteristics of medication errors in pediatric and neonatal inpatients and to measure the impact of interventions to reduce medication errors. A pre intervention and post intervention cross-sectional study was conducted of pediatric settings at the Hospital Italiano de Buenos Aires, department of Pediatrics in 2002 and 2004. A total of 590 prescriptions and 1174 drug administrations for 95 patients in the first phase of the study and 1144

prescriptions with 1588 drug administrations for 92 patients in the second phase were evaluated. The prevalence of medication error rate in the second phase was 7.3% (199 of 2732) and 11.4% (201 of 1764) in the first phase. The risk difference was -4.1%. The development of a program mainly centered on the promotion of a cultural change in the approach to medical errors could effectively diminish medication errors in neonates and children.

Barber and Taxis (2003), determined the incidence and clinical importance of errors in the preparation and administration of intravenous drugs and the stages of the process in which the error occur. Study was performed in 10 wards in a teaching and non teaching hospital. Two hundred and forty nine errors were identified. At least one error occurred in 212 out of 430 intravenous drug doses. Three doses (1%) had potentially severe errors, 126 (29%) potentially moderate errors, and 83(19%) potentially minor errors. Most errors occurred when giving bolus doses or making up drugs that required multiple step preparation. The rate of intravenous drug errors was high. A combination of reducing the amount of preparation on the ward, training, and technology to administer slow bolus doses would probably have the greatest effect on error rates.

Bruce and Wong (2001), conducted a study to determine the error rate during preparation and administration of parenteral medications by nursing staff and to propose strategies to reduce the error rate during parenteral administration. A direct observational method was used. The investigator observed and recorded errors that occurred during the preparation and administration of parenteral medication on an admission ward between 8 .00 am and 4.30 pm from Monday to Friday, for a four week period during December 1998. Drug administration was witnessed for a four week period providing 107 opportunities for error. Twenty seven errors were observed which equate to an error rate of 25.2% including wrong time errors. Excluding wrong time errors, the most frequently occurring type of error reduced the error rate to 10.3%. In observed hospital, only nursing staff who have completed a training package was allowed to determine parenteral medications.

Fahimi et al (2008), conducted a study to determine the frequency of medication errors that occurred during the preparation and administration of IV drugs in an intensive care unit. Study was conducted in a 12-bed intensive care unit of one of the largest teaching hospitals in Tehran. Data were collected over 16 randomly selected days at different medication round times, between July and September 2006. A trained

observer accompanied nurses during intravenous (IV) drug rounds. Medication errors were recorded during the observation times of IV drug administration and preparation. A total of 524 preparations and administrations were observed. Calculated number of opportunities for error was 4040. Number of errors identified were (9.4%). Of those, 33.6% were related to the preparation process and 66.4% to the administration process. Most common type of error (43.4%) was the injection of bolus doses faster than the recommended rate. Amikacin was involved in the highest rate of error (11%) among all the selected medications. It was found that the IV rounds conducted at 9:a.m. had the highest rate of error (19.8%).

Wolf(2006), concentrated on teaching nursing students about safe medication administration practices and on challenging them to develop skills for calculating drug dose and intravenous flow rate problems. This descriptive, retrospective, secondary analysis study examined the characteristics of medication errors made by nursing students during the administration phase of the medication. Fewer than 3% of 1,305 student-made medication errors occurring in the administration process resulted in patient harm. Most were omission errors, followed by errors of giving the wrong dose (amount) of a drug. The most prevalent cause of the

errors was students' performance deficits, whereas inexperience and distractions were leading contributing factors. Overall, this study showed that students' administration errors might be more frequent than suspected. Faculty might consider curriculum revisions that incorporate medication use safety throughout each course in nursing major courses.

Sheu, et al (2007), conducted a study to investigate nurses' views on the factors contributing to medication errors in the hope of facilitating improvements to medication administration processes. A focus group of nine Registered Nurses discussed medication errors with which they were familiar as a result of both their own experiences and of literature review. The researchers developed a semi-structured questionnaire consisting of three parts: narrative description of the error, the nurse's background and contributing factors. After the contributing factors had been elicited and verified with eight categories and 34 conditions, additional Registered Nurses were invited to participate by recalling one of the most significant medication errors that they had experienced and identifying contributing factors from those listed on the questionnaire Of the 72 female nurses who responded, 55 (76·4%) believed more than one factor contributed to medication errors. 'Personal neglect' (86·1%), 'heavy workload' (37·5%) and 'new staff' (37·5%) were the three main factors in the eight

categories. 'Need to solve other problems while administering drugs,' 'advanced drug preparation without rechecking,' and 'new graduate' were the top three of the 34 conditions. Medical wards (36·1%) and intensive care units (33·3%) were the two most error-prone places. The errors common to the two were 'wrong dose' (36·1%) and 'wrong drug' (26·4%). Antibiotics (38·9%) were the most commonly misadministered drugs. Although the majority of respondents considered nurse's personal neglect as the leading factor in medication errors, analysis indicated that additional factors involving the health care system, patients' conditions and doctors' prescriptions all contributed to administration errors.

2.3 Conclusion:-

Insufficient knowledge is a factor in nurses drug administration errors. Most errors do not harm patients, but incorrect administration of high-alert medications can result in serious consequences. Sufficient knowledge about high-alert medications is vital. (Hsaio, et al 2010). Every tenth prescription had medication error in ordering or dispensing; of this, every sixth prescription in Emergency Department and nineteenth prescription in NICU had medication error. Dosing errors were the commonest form of detected errors. Jain, et al (2009).The development of a program mainly centered on the promotion of a cultural change in the

approach to medical errors could effectively diminish medication errors in neonates and children. (Leyton, et al 2008). Most of the studies shows that nurses have not much knowledge about medication administration especially in dose calculations. Studies recommended educational programmes for improving nurse's knowledge.

Table 2.1 key terms used for searching articles

Nurse's knowledge on high alert medications.	26
Medication errors	100
Medication safety education programme	659
A study to assess nurses knowledge about medicationion errors	564
Reporting medication errors to improve patient safety	516

CHAPTER - 3

METHODOLOGY

3.1 INTRODUCTION:-

This chapter deals with the research approach, setting, the sample and sampling techniques, development of tool, description of tool, pilot study, data collection procedure and plan for analysis.

3.2 RESERCH APPROACH

A descriptive survey approach is used.

The objectives of the study are:-

- To identify knowledge about selected cardiovascular drugs among cardiac nurses
- To find out the relationship between knowledge about selected cardiovascular drugs and selected variables

3.3 SETTINGS:-

The study is conducted in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum; an Institute of National importance established by an Act of the Indian Par lament. It is an

autonomous Institute under the administrative control of the Department of Science and Technology, Government of India. In Sree Chitra Tirunal Institute for Medical Sciences and Technology., nursing staff are selected on the basis of written exam and interview. The selection ensures intellectually bright nurses only to be selected as nursing staff of the institute.

3.4 SAMPLE AND SAMPLING TECHNIQUE :-

The sample was selected from the nursing staff working in Sree Chitra Tirunal Institute for Medical Sciences and Technology; Trivandrum. The size of the sample was forty. A purposive sampling technique was used to collect the samples. The samples were selected from the nursing staff working in CMICU and CSICU. The duration of study period was from August 2010 to October 2010.

3.5 INCLUSION CRITERIA:-

Nursing staff working in Cardiac Surgical Intensive Care Unit and Cardiac Medical Intensive Care Unit in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum.

3.6 EXCLUSION CRITERIA

Nursing staff working in departments other than CMICU and CSICU.

3.7 DEVELOPMENT OF DATA COLLECTION TOOL

Data collection tool refers to instruments, which was constructed to obtain relevant data. An extensive review and study of literature and journal articles helped in preparing item for the tool. The investigator prepared a knowledge test use Questionnaire as tool for the study. Expert in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, approved the tool.

3.8 DEVELOPMENT OF DATA COLLECTION TOOL

The tool present in the following study consist of the following parts.

Part – 1

The part 1 Socio demographic data, which consist of age, sex, qualification, place of work, additional qualification, CPCR training programme attended, total year of experience.

Part –2

It consist of fifteen multiple choice questions about selected cardiovascular drugs. It covers nurses knowledge on selected cardiovascular drugs, about actions, required dose, indications, adverse reactions, interactions, method of administration and calculation of infusion rate. Each correct answer carries one mark. Actual duration for completing the questionnaire was about ten minutes.

3.9 PILOT STUDY:-

A Pilot study was conducted to find out the feasibility and practicability of the tool and methodology. After obtaining permission from the authorities pilot study was conducted among the nursing students of Sree Chitra Tirunal Institute for Medcal Sciences and Technology, Trivandrum. Ten students were taken for pilot study. The purpose of the study was to test the feasibility of original tool.

3.10 DATA COLLECTION

For data collection formal permission was obtained from the authorities. The total period of data collection was from August to October 2010. The investigator first introduced herself and explained the need and purpose of study. Confidentiality of their responses was assured

and consent was obtained from each nursing staff. The nursing staff were given the knowledge test to complete. The time taken for completion is about ten minutes.

3.11 PLAN OF ANALYSIS

The investigator developed a plan for data analysis after the pilot study. The data obtained from the nursing staff was analysed by descriptive statistics and is presented in the form of tables , bar diagrams and pie diagrams.

3.12 SUMMARY

This chapter presented the research approach used for the study, setting of the study, sample and sampling techniques, development of data collection tool, description of tool, pilot study, data collection procedure, and plan for data analysis.

CHAPTER – 4

ANALYSIS AND INTERPRETATION OF DATA

This chapter presents the analysis and interpretation of data collected from forty Cardiac nursing staff working in CMICU and CSICU at Sree Chitra Tirunal Institute for Medical Science and Technology, Trivandrum. Forty nurses were selected for assessing the knowledge about selected cardiovascular drugs. Analysis is a process of organizing and synthesizing data in such a way that research questions can be answered. The over all objective of analysis is to organize structure and elicit answers from the assessment.

Interpretation is the process of making sense of the result and examining the implication of finding within the broader content.

The finding of the study were analyzed and arranged under the following sections.

4.1 Distribution of sample according to demographic data.

4.2 Distribution of sample according to knowledge score.

4.3 Comparison of mean, standard deviation and p value of nurses knowledge about selected cardiovascular drugs and selected variables.

4.1 Distribution of sample according to demographic data.

Distribution of sample according to age:-

The age of sample ranged from 25 to 55 with a mean age of 35.77, standard deviation of 9.42, median age of 32 and mode of 30.

AGE CATEGORY	FREQUENCY	PERCENTAGE
25 - 35	24	60%
36 - 45	8	20%
46 - 55	8	20%
TOTAL	40	100%

Age categories were made based on the age distribution of sample so as to have a minimum number under each class. The data given in Table 4.1 shows that majority of samples belonged to the younger age category (25 – 35).

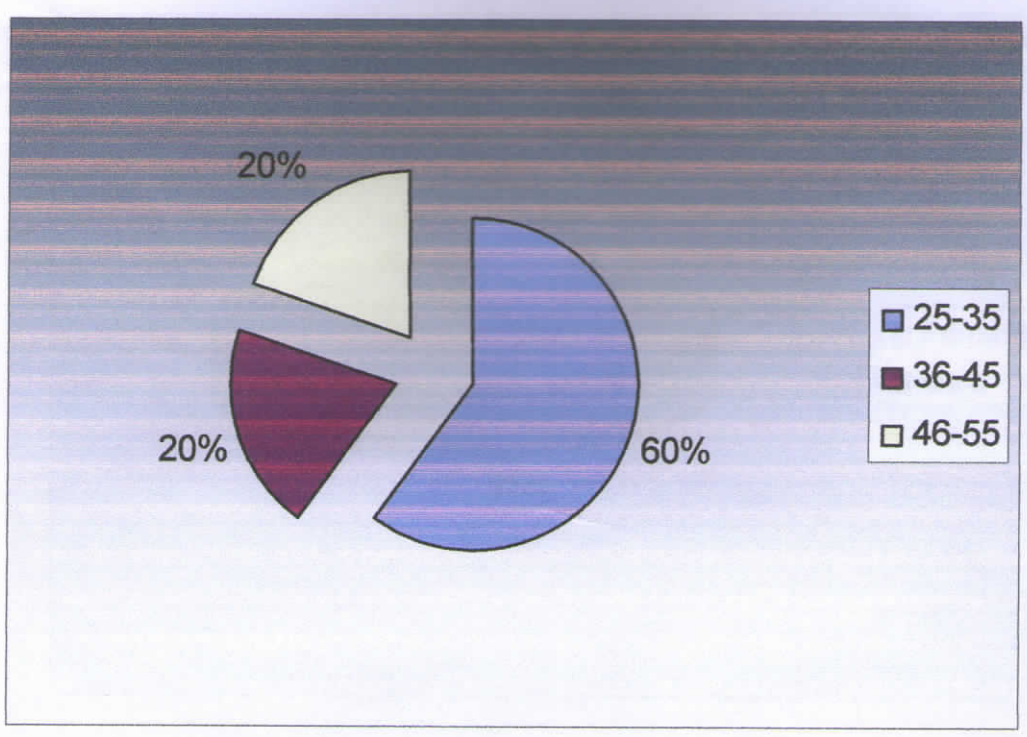

Fig 4.1 The diagram showing the distribution of samples according to age category.

Distribution of sample according to sex:-

Table 4.2 shows the distribution of sample according to sex. There were 38 (95%) females in the sample.

Table 4.2. Distribution of samples according to sex category

SEX	FREQUENCY	PERCENTAGE
FEMALE	38	95%
MALE	2	5%
TOTAL	40	100%

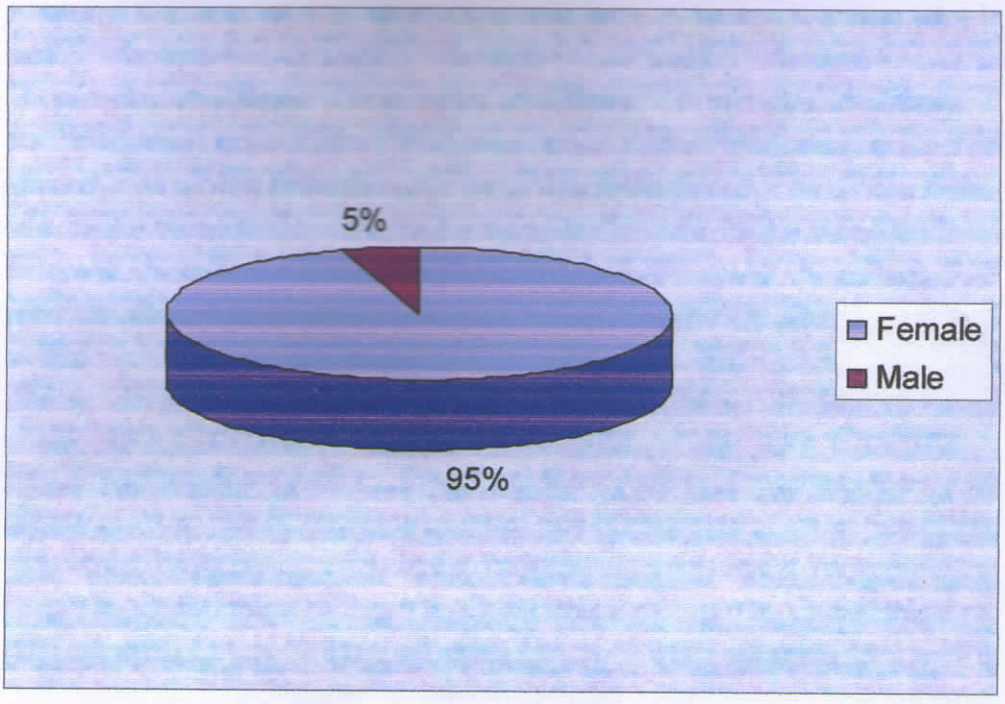

Fig 4.2 The pie diagram shows distribution of sample according to sex category.

Distribution of sample according to year of experience:

Data collected from cardiac nurses with their year of experience, which ranged from 1 - 30 years.

Table 4.3 Distribution of samples according to year of experience

EXPERIENCE	FREQUENCY	PERCENTAGE
1 - 10	24	60%
11 - 20	8	20%
21 - 30	8	20%
TOTAL	40	100%

Data given in Table 4.3 shows that twenty four of them had 1 - 10 years of experience, eight of them had 11 - 20 year experience and eight of them had 21 - 30 year of experience.

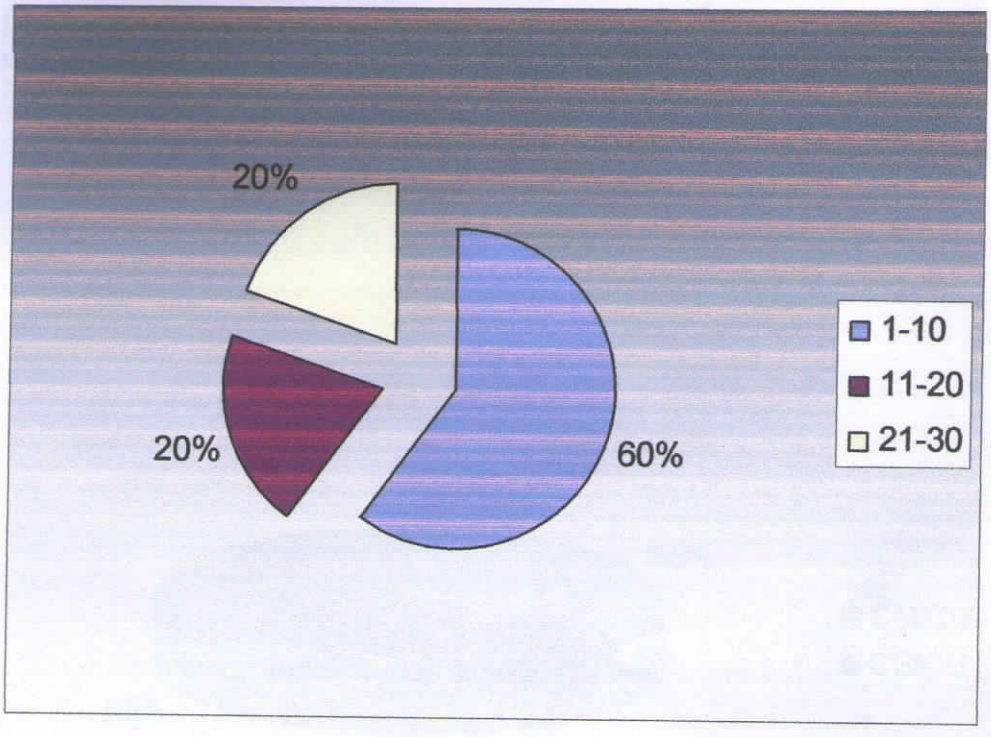

Fig 4.3 The pie diagram showing the distribution of samples according to year of experience.

Distribution of sample according to working area:-

The samples were distributed among the nurses in CMICU and CSICU. 35% of them working in CMICU and 65% of them working in CSICU.

Table 4.4 Distribution of samples according to working area

WORKING AREA	FREQUENCY	PERCENTAGE
CMICU	14	35%
CSICU	26	65%
TOTAL	40	100%

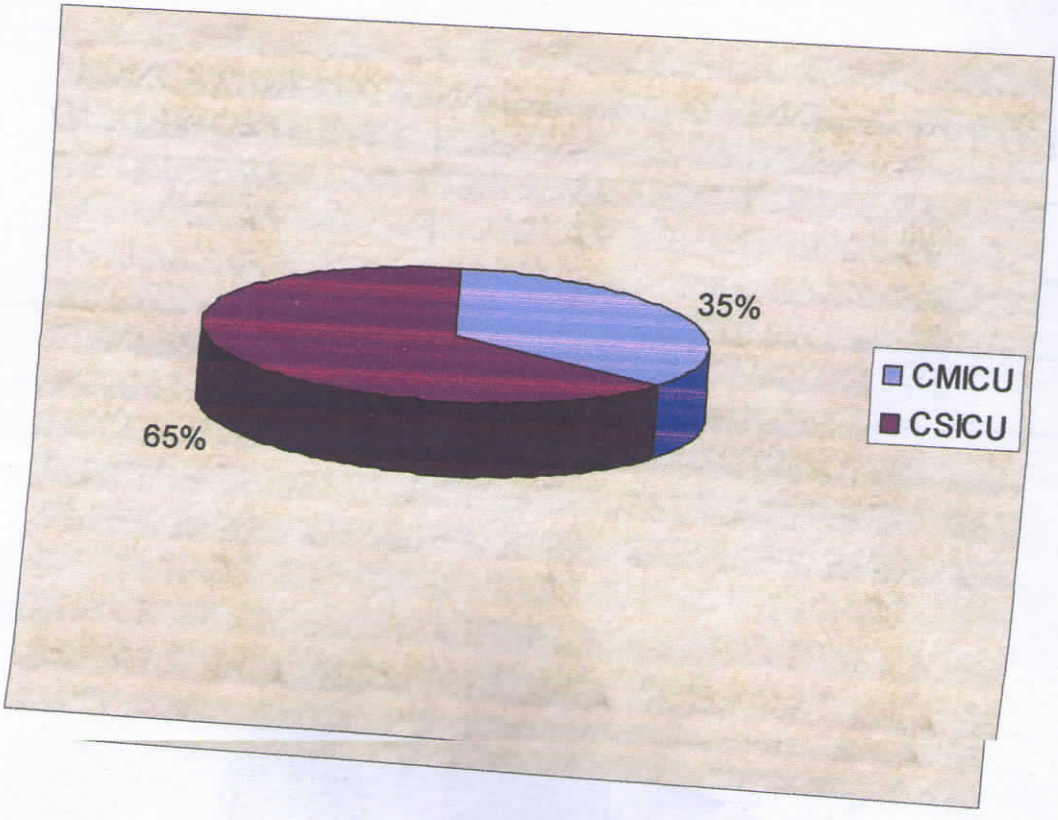

Fig 4.4 The pie diagram showing distribution of samples according to working area.

Distribution of sample according to educational qualification.

Data collected from cardiac nurses working in CMICU and CSICU shows that 40% of them are GNM, 55% of them are BSc nursing and 5% of them are MSc nursing.

Table 4.5. Distribution of sample according to educational qualifications

EDUCATIONAL QUALIFICATIONS	FREQUENCY	PERCENTAGE
GNM	16	40%
BSc (N)	22	55%
MSc (N)	2	5%

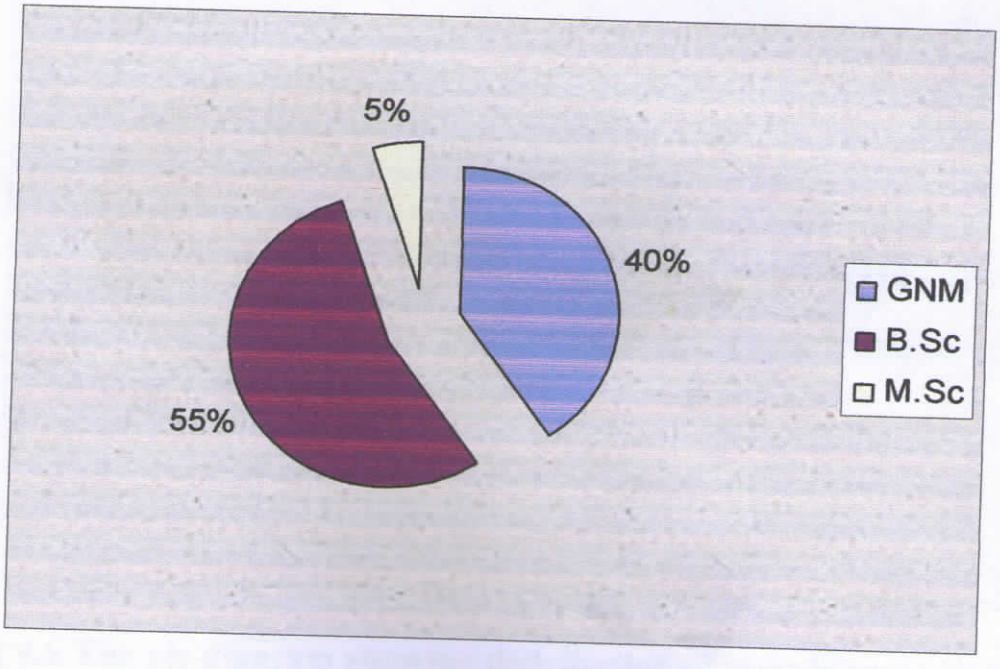

Fig 4.5 The pie diagram shows the distribution of sample according to educational qualification.

Distribution of sample according to CPCR training,

Data shows that 37.5 have attended CPCR training program and 62.5% of them have not attended the programme.

Table 4.6 Distribution of sample according to the CPCR t raining

CPCR TRAINING PROGRAMME	FREQUENCY	PERCENTAGE
ATTENDED	15	37.5%
NOT ATTENDED	25	62.5%
TOTAL	40	100%

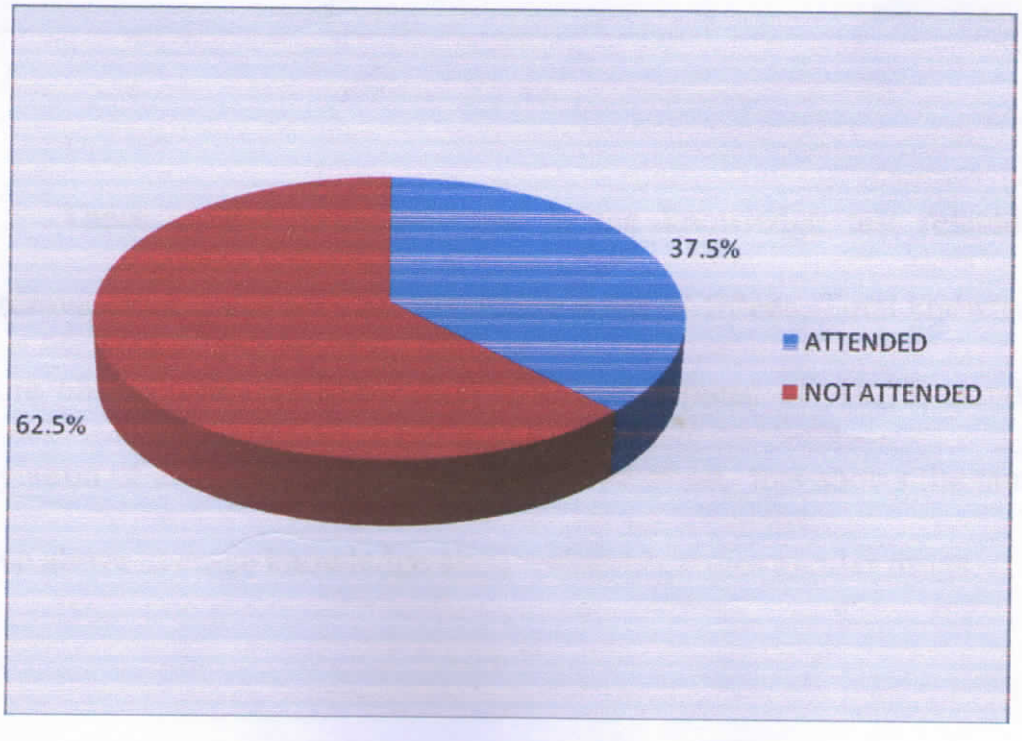

Fig 4.6 The pie diagram showing distribution of sample according to the CPCR training.

Distribution of sample according to CPCR training,

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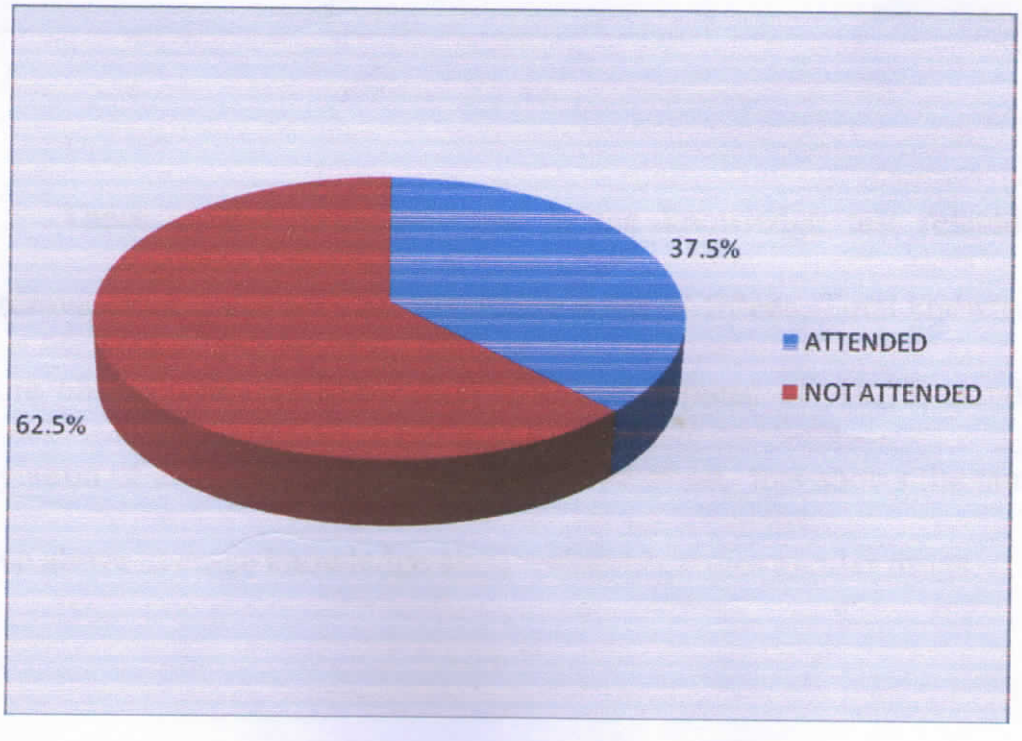

Fig 4.6 The pie diagram showing distribution of sample according to the CPCR training.

4.2 Distribution of sample according to percentage of knowledge score about cardiovascular drugs among cardiac nurses.

Table 4.7 Distribution of sample according to percentage of knowledge score on selected cardiovascular drugs among cardiac nurses.

KNOWLEDGE SCORE	FREQUENCY	PERCENTAGE
5 - 10	20	50%
11 - 15	20	50%
TOTAL	40	100%

There were fifteen questions in the knowledge test related to cardiovascular drugs with the maximum score of fifteen. Total knowledge score obtained ranged from 5 - 15 with a mean of 10.75, standard deviation of 2.40, median of 10.5 and mode of 10, this shows the nurses have above average knowledge about selected cardiovascular drugs.

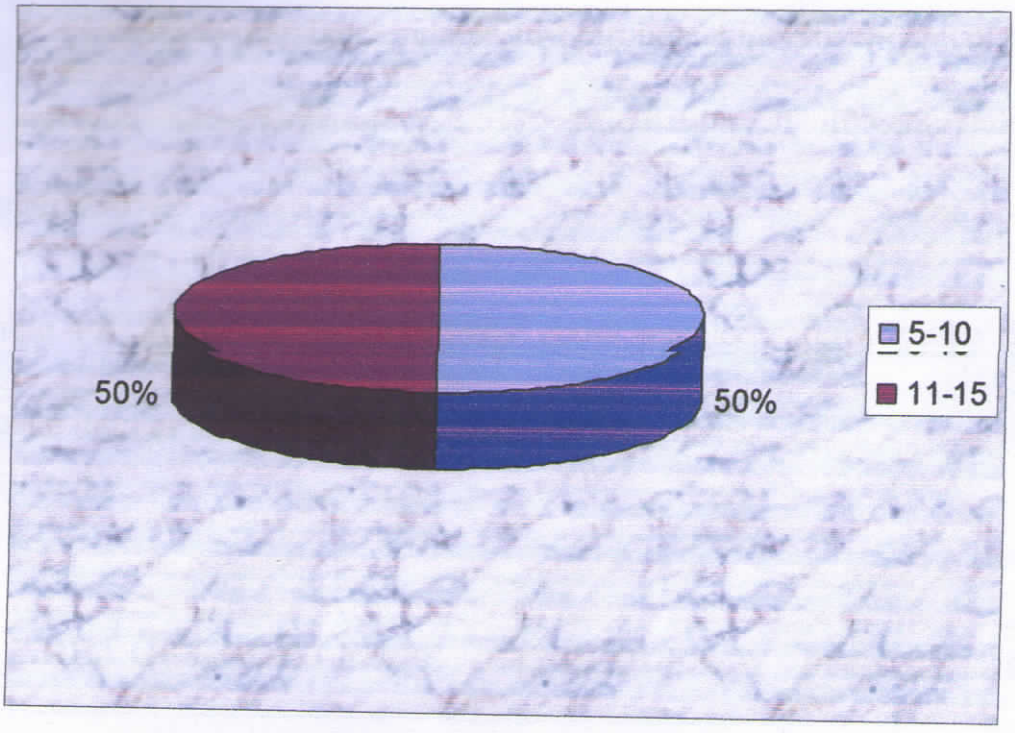

Fig 4.7 The pie diagram shows the knowledge score of cardiac nurses about selected cardiovascular drugs.

Percentage of score in the area of knowledge about selected cardiovascular drugs.

The data given in Table 4.8 shows the percentage of knowledge obtained in each item of knowledge test on cardiovascular drugs. Result shows that the area of lesser knowledge(<50%)are, action of β agonist (37.5), nursing diagnosis appropriate for client receiving Dopamine infusion(42.5%).The area of higher knowledge(.≥ 85%) are side effect of Milrinone(85%), usage of nitrate patch(87.5%), monitoring the therapeutic effect of Heparin(85%),

Electrolyte imbalance related to Spironolactone(90%), Calculation of infusion rate- Dopamine(92.5%), calculation of infusion rate – Heparin(90%),

Table 4.8 Percentage of knowledge about selected cardiovascular drug in each item of knowledge test among cardiac nurses.

N=40

AREA OF KNOWLEDGE	FREQUENCY	PERCENTAGE
The action of ß agonist	15	37.5%
Cardiac glycoside toxicity	25	62.5%
A condition associated with Digoxin toxicity	30	75%
Side effect of Milrinone	34	85%
Usage of Nitrate patch	35	7.5%
Side effect of Adenosine	29	72.5%
Electrolyte imbalance related to Spironolactone	36	90%
Drug interaction - Warfarine	31	77.5%
Monitoring the therapeutic effect of Heparin	34	85%

Nursing diagnosis appropriate for a client receiving Dopamine infusion	17	42.5%
Adverse reaction of Amiodarone	20	50%
Calculation of infusion rate Dopamine	37	92.5%
Calculation of infusion rate Heparin	36	90%
Action of ACE inhibitors	32	80%
Dose of Amiodarone infusion in Ventricular tachycardia	22	55%

4.3 Comparison of mean, standard deviation and p value of knowledge score and selected variables.

Table 4.9 Mean, standard deviation and p- value of knowledge score by age group

AGE IN YEARS	MEAN	STANDARD DEVIATION	P VALUE
Young age <32	9.68	2.41	0.006
Older age = 32	11.71	2.0	

The median was used to divide the group in to two- young age < 32 years and older age(= 32 years).

The knowledge score of younger age group ranged from 5 to 15 with a mean of 9.68 ± 2.41 and that of older age group ranged from 8 to 14 with a mean of 11.71± 2. An unpaired 't' test showed that the older age group had significantly higher mean knowledge about cardio vascular drugs (P = 0.006).

According to years of experience:-

Table 4.10 Mean knowledge score by years of experience.

YEAR OF EXPERIENCE	MEAN	STANDARD DEVIATION	P VALUE
Lesser experience (1 - 10 yrs)	10.08	2.43	0.03
More experience (>10 yrs)	11.75	2.05	

The knowledge score of less experience group ranged from 5 - 15 with mean of 10.08±-2.43 and that of high experience group ranged from 8 -14 with a mean of 11.75±2.05. An unpaired 't' test showed that the high experience group had significantly higher mean knowledge (p = 0.03).

According to areas

Table 4.11 Mean knowledge score according to areas.

PLACE OF WORK	MEAN	STANDERD DEVIATION	P VALUE
CMICU	10.86	1.87	0.84
CSICU	10.69	2.68	

In CMICU the knowledge score ranged from 8 - 14 with a mean of 10.86 ± 1.87. From CSICU the knowledge score ranged from 5 - 15 with a mean of 10.69 ± 2.68. The probability of this result is 0.84. Most of them are at same range of mean. There is no significant difference in the mean knowledge score of nurses in CMICU or CSICU.

According to the CPCR training programme attended

Table 4.12 Mean knowledge score according to the CPCR training programme attended

CPCR TRAINING PROGRAMME	MEAN	STANDARD DEVIATION	P VALUE
ATTENDED	10.93	2.34	0.714
NOT ATTENDED	10.64	2.48	

In CPCR attended group the knowledge score ranged from 8- 14 with mean of 10.93 ± 2.34 . In the case of CPCR non attended group the knowledge score ranged from 5 - 15 with mean of 10.64±2.48 .There is no significant variations in the mean knowledge score, most of them at same range of mean.

CHAPTER - 5

SUMMARY, CONCLUSION, LIMITATION, DISCUSSION AND RECOMMENDATION

This chapter gives a brief account of the present study including conclusion drawn from the findings and possible application of the results. Recommendation for further research and suggestion for improving the present study are also presented.

SUMMARY:-

This study was undertaken to assess the knowledge about selected cardiovascular drugs among cardiac nurses, working in Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandram.

The specific objectives of this study:-

1 To identify the knowledge about selected cardiovascular drugs among cardiac nurses.

2 To identify the relationship between knowledge about selected cardiovascular drugs and selected variables.

Need for study was that many studies done in abroad and also in India revealed lack of knowledge among critical care nurses about high alert medications, especially in drug dose calculation. Cardiac nurses are responsible for preparing and administering potent drugs that affects the patients cardiovascular functions. The investigators experience in Cardiac Surgical Intensive Care Unit in Sree Chitra Tirunal Institute for Medical Sciences and Technology, showed that the newly joined nurses have not much knowledge about the action of various Inotropes with changing dosage. This study was an attempt to find out whether the nursing staff working in Sree Chitra Tirunal Institute for Medical Sciences and Technology, have adequate knowledge about selected cardiovascular drugs. A self prepared questionnaire was used for assessing the knowledge level of nursing staff. After assessment the investigator explained and cleared doubts regarding cardiovascular drugs.

The study was conducted in Sree Chitra Tirunal institute for Medical Sciences and Technology, Trivandram, Kerala, during the period of August to October 2010.cardiac nurses were selected by purposive sampling. Total sample size is forty.

Major findings of the study:-

This study shows that cardiac nurses knowledge on selected cardiovascular drugs is above average.(10.75/15).There was a statistically significant difference between the mean knowledge score and age as well as year of experience. However there was no statistical significant difference between mean knowledge and area of work and CPCR training.

DISCUSSION:-

In this study 15 item survey includes specific questions about selected cardiovascular drugs. A total forty cardiac nursing staff responded to the survey. The data given in Table 4 .8 shows the nurses had above average knowledge about selected cardiovascular drugs. Study shows that cardiac nurses knowledge on cardiovascular drugs are about 71.67% that is (10.75 / 15). Hsaio et al (2009), performed a study about the development and validation of an instrument to measure nurses' knowledge of high-alert medications and to analyse known administration errors. The investigator concluded that nurses have insufficient knowledge about high-alert medications and could benefit from additional education, particularly associated with intravenous bolus

administration of high-alert medications. Oshikoya et al (2008) conducted a study to determine adequacy of knowledge of skills of drug dose calculations in children acquired by medical students during their clinical attachment in paediatrics. The study concluded that medical students lacked the basic knowledge of paediatric drug dose calculation. Hajebi et al (2010), Performed a study to determine the knowledge, attitude and practice of nurses towards pharmacovigilance in the taleqani medical teaching and treatment centre in Tehran. The results showed that it is necessary to conduct continuous adverse drug reaction educational programme until voluntary monitoring of adverse drug reaction become conventional and habitual among nursing staff.

LIMITATION:-

The study was limited to Cardiac nurses working in CMICU and CSICU in Sree Chitra Tirunal Institute for Medical sciences and Technology, Trivandram.

CONCLUSION:-

Based on the findings of the study following conclusions were drawn. Nurses have above average knowledge about selected cardiovascular drugs including flow rate calculations. Older age group

and high experience group had significantly higher mean knowledge score than young age and less experience group. However, the study shows that there was no statistically significant difference between the mean knowledge score and area of work and CPCR training.

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KNOWLEDGE TEST FOR NURSES ON SELECTED CARDIOVASCULAR DRUGS

SOCIO DEMOGRAPHIC DATA

1. AGE : ☐Years

2. SEX : Male ☐ Female ☐

3. QUALIFICATION : GNM ☐ BSc(N) ☐ MSc(N) ☐

4. ADDITIONAL QUALIFICATIONS IF ANY :

5. PLACE OF WORK : CMICU ☐ CSICU ☐

6. TOTAL YEAR OF EXPERIENCE : ☐ Years

7. CPCR TRAINING PROGRAMME : Attended ☐ Not attended ☐

Note: Place a tick(✓) mark on the most appropriate answer. Total Fifteen questions, each one carries one mark.

1) Nurses caring for a patient receiving ß agonist drug therapy need to be aware that these drug cause?

   a) Increased cardiac contractility

   b) Broncho constriction

   c) Decreased heart rate

   d) Increased GI tract mobility

2) When teaching the patients about Cardiac glycoside toxicity nurse should alert the patient to watch for?

a) Visual changes such as photophobia

b) Flickering light or halos around light

c) Dizziness when standing up

d) Increased urine out put

3) Which of the following finding would indicate an increased possibility of toxicity in a patient receiving Digoxin?

a) Digoxin level of 1.5 ng/ml

b) Serum potassium level of 2.0mEq/L

c) Serum potassium level of 4.8 mEq/L

d) Apical pulse rate 62 beat/minute

4) When monitoring a patient who is receiving an intravenous infusion of Milrinone, the nurse would look for which adverse effect?

a)Thrombocytopenia

b)Proteinuria

c)Anemia

d)Decreased BUN and creatinine

5) A home health nurse instruct the client about the use of Nitrate patch. Which of the following will prevent client's tolerance to Nitrate?

a) Do not remove the patch

b) Have a 12 hrs "no Nitrate time"

c) Have a 24 hrs "no Nitrate time"

d)Keep Nitrate on 24 hrs then off 24 hrs

6) A patient with rapid irregular heart rhythm is being treated in the emergency department with Adenosine. During administration of this drug the nurse should be prepared to monitor the patient for which effect?

a) Nausea ,vomiting

b) Transitory asystole

c) Muscle tetany

d) Hypertension

7) Which one of the following electrolyte imbalance is related to Spironolactone?

a)Serum sodium level of 133 mEq/L

b)Serum potassium level of 3.3mEq/L

c)Serum potassium level of 5.8mEq/L

d)Serum sodium level of 150mEq/L

8) A patient receiving warfarin therapy asks the nurse about medication for headache. The nurse should tell her to avoid which of the following medications?

a)Opiods

b)Acetaminophen

c)NSAIDS

d)There are no restriction

9) The nurse is caring for a client receiving Heparin Iv infusion . Which laboratory study will be prescribed to monitor the therapeutic effect of Heparin ?

a)Prothrombin time

b) APTT

c) Hematocrit

d) INR

10) A nurse is caring for client receiving Dopamine. Which of the following potential nursing diagnosis is appropriate for the client?

a) Increased cardiac out put

b) Excess fluid volume

c) Impaired tissue perfusion

d) Disturbed sensory perception

11) When assessing a patient getting Amiodarone for 6 months, which adverse reaction might the nurse identify?

a) Glycosuria

b) Dysphagia

c) Photophobia

d) Urticaria

12) For a patient of 80 kg to start Dopamine infusion at 10 mcg/ kg/ minute how many ml/hr is to be adjusted with dilution of 400 mg in 50 ml?

a) 4.5 ml/hr

b) 6 ml/hr

c) 10 ml/hr

d) 5 ml/hr

13) A client with Deep Vein Thrombosis is receiving IV infusion of Heparin at 1500 unit/ hr. The concentration in the bag is 25000 units/50ml. How many ml/hr is to be given in an infusion pump?

a) 5 ml/hr

b) 2.5 ml/hr

c)3 ml/hr

d) 4 ml/hr

14) Captopril, an ACE inhibitor is administered to a client with heart failure because it act as a/an

a) vasopressor

b) volume expander

c) vasodilator

d) inotropic

15) A patient's cardiac monitor reveals VT, and is conscious, a bolus of Amiodarone is ordered followed by a continuous infusion for 6 hrs. What amount should you expect to administer?

a) 300mg followed by 1 mg /minute

b) 300mg followed by 0.5mg /minute

c) 150mg followed by 1 mg/minute

d) 150mg followed by 0.5mg / minute

ANSWER KEY

1 (a) 2 (b) 3(b) 4(a) 5(b) 6(b) 7(c) 8(c)

9(b) 10(c) 11(c) 12(b) 13(c) 14(c) 15(c)