CHAPTER I
INTRODUCTION

CONTENTS

1.1. BACKGROUND OF THE STUDY
1.2. NEED AND SIGNIFICANCE OF THE STUDY
1.3 STATEMENT OF THE PROBLEM
1.4 OPERATIONAL DEFINITIONS
1.5. HYPOTHESIS
1.6. ASSUMPTION
1.7. OBJECTIVES OF THE STUDY
1.8. LIMITATIONS OF THE STUDY
INTRODUCTION

1.1 BACKGROUND OF THE STUDY

“Heart Beat – The Rhythm of Health” was the theme of World Health day 1992; and the aim of World Health Organisation was to increase public awareness of world wide dimensions on cardiovascular diseases.

Cardiovascular diseases have been identified as one of the major public health problems and account for a major proportion of all deaths during adulthood in both developed and developing countries (WHO 1990).

Heart is a vital organ. Cardiac surgery has advanced immensely due to technological and scientific innovations. Heart valve replacement surgery is a major surgery and inspite of boundless advancement in procedures and sophisticated technological support available now complications do occur. The prognosis of such patients will be determined by several factors, one of which could possibly be pre operative educational intervention. This study is attempt to examine whether education intervention given prior to surgery helps to increase awareness, attitude and practice (KAP) and whether the increased KAP prevent some of the complications.
Rheumatic fever is a multi-system, immunologically mediated inflammatory disease, that occurs as a delayed sequel to group A streptococcal (GAS) infection. Rheumatic Heart disease (RHD) is a complication of rheumatic fever. It remains as a major public health problem in developing countries. As many as 39% of patients with acute rheumatic fever may develop varying degrees of pancarditis with associated valve insufficiency, heart failure, pericarditis and even death. With chronic rheumatic heart disease, patients develop valve stenosis with varying degrees of regurgitation, atrial dilation, arrhythmias and ventricular dysfunction. Chronic rheumatic heart disease remains the leading cause of mitral valve stenosis and valve replacement in adults in the United States.

Valvular heart disease in India is almost wholly due to rheumatic heart disease. Prevalence statistics about rheumatic heart disease showed that 12 million patients worldwide require further treatment to prevent disability and death. (cardiovascular diseases prevention and control, WHO, CVD strategy, 2001-2025). Moreover estimated 8 million school children worldwide require further treatment to prevent disability and death. (cardiovascular diseases prevention and control, WHO, 2001-2002). Also mentioned that may affect 15 per 1000 school children (WHO/AFRO web site).
Contemporary medical science has focused on drug based management and development of non surgical and non invasive procedures for treating cardiovascular diseases. Even then, open heart surgery remains the only treatment procedure for a number of serious conditions. Valve replacement surgery is one of the commonly performed open heart interventions.

The first human valve operation to implant prosthesis was carried out by Hufnagel in 1950. He designed a ball valve and developed and implanted.

Doctor Albert Starr made valve replacements possible in a reliable and reproducible fashion with the development of the first widely used valve prostheses in the early 1960s. Valve replacement makes it possible to improve life expectancy and quality of life of patients.

Caring for perioperative clients is a challenging and gratifying speciality. The goal of perioperative nursing practice is to assist patients and their family members to achieve a level of well being equal to or greater than they were having during the admission and procedures.

An important aspect of nursing practice in such situations is to provide adequate knowledge to patients and other care givers so as to help in preventing and managing post operative complications and also to instill proper
attitudes in the patient to respond positively and cooperate with the intervention procedures and routines. The patient needs to be instructed regarding

- The general nature of the disease condition
- Surgical intervention planned, overall idea of what is involved in the procedures.
- Drug and other therapeutic support planned
- Expected complications and provision for managing complications
- Warning signs of complications and what to do under such situations
- What is expected of the patient by the medical persons, care givers and other participants in the treatment programme.
- What should the patient do to avoid complications.

It is essential that this knowledge is provided to the patient who predictability could be under extreme stress, in a compassionate and personal way. The nursing practitioner is the ideal professional to develop the knowledge required in these situations. The combination of expert professional knowledge and the position of close personal interaction with the patient makes the nursing practitioner the only possible choice in this aspect.
Demand for performance information for managed care plans will be much greater than it has been in the past. It is, therefore, imperative that we collect data to reflect the quality and value of our work to ensure that significant quality is not being sacrificed for cost containment. The general background of the present study is explained by these factors.

According to Halbert Dunn (1958) information is one of the basic human needs. Knowledge is an important aspect of prevention of complication. Knowledge of information is power. People acquire knowledge through formal and informal education, mass media and other means of interaction with one another. Patients seek information from all possible sources pertaining to their condition. They try to raise their questions to doctors, nurses and other health team personnel, patients, relatives regarding their treatment and health conditions.

1.2 NEED AND SIGNIFICANCE OF THE STUDY

In most developing countries where low literacy is a key factor that hampers progress, the poor knowledge regarding cardiovascular diseases has certainly had a big impact on the quality of success achieved through medical care. In the state of Kerala with a long history of high literacy and educational progress one would expect a contrary picture. Unfortunately medical practitioners and administrators have pointed out that inspite of the high literary,
specific knowledge regarding prevention and treatments of cardiovascular diseases is not of an expected level in Kerala. There is an urgent need to focus on educational intervention programs based on specific disease conditions in hospitals where patients undergo surgical procedures. A review of studies in this field shows that no major study has adequately addressed the educational aspects of the effect of educational intervention on specific post operative complications in patients who undergo heart valve replacement surgery.

Surgery is an ever changing field. Standard safety precautions must be followed, but as new research and clinical experience broaden our knowledge, changes in treatment and drug therapy may become necessary or appropriate.

The Cardiovascular and Thoracic surgery department of Thiruvananthapuram, Medical College is the oldest and most developed centre of its kind in Kerala. The statistics from this center are as given below. Table No.1 shows the number of open heart surgeries and the relative incidence of heart valve replacements surgery and its percentage in relation to open heart surgery.
Table No.1 Showing details of open heart surgery and valve replacement surgeries from 1990-2003 in MCH, Trivandrum

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Period</th>
<th>Open heart surgery</th>
<th>Valve replacement surgery</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 1990 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 1991</td>
<td>132</td>
<td>44</td>
<td>33.3</td>
</tr>
<tr>
<td>2</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 1992 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 1993</td>
<td>185</td>
<td>44</td>
<td>23.78</td>
</tr>
<tr>
<td>3</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 1994 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 1995</td>
<td>241</td>
<td>54</td>
<td>22.41</td>
</tr>
<tr>
<td>4</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 1996 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 1997</td>
<td>326</td>
<td>72</td>
<td>22.09</td>
</tr>
<tr>
<td>5</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 1998 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 1999</td>
<td>244</td>
<td>52</td>
<td>21.31</td>
</tr>
<tr>
<td>6</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 2000 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 2001</td>
<td>576</td>
<td>122</td>
<td>21.2</td>
</tr>
<tr>
<td>7</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Jan 2002 to 31&lt;sup&gt;st&lt;/sup&gt; Dec 2003</td>
<td>469</td>
<td>152</td>
<td>32.40</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>2173</td>
<td>540</td>
<td>24.85</td>
</tr>
</tbody>
</table>

The heart valve replacement surgeries form a major bulk of all open heart surgeries (24.85%) in Thiruvananthapuram Medical College. As one of the frequently performed open heart intervention, study of educational intervention in this area has a high priority for research.
During the data collection period (20.06.2001 to 14.08.2002) the number of open heart surgeries carried out were 308. Out of which the valve replacement cases were 113.

Under the circumstance the study on effect of educational intervention on the prevention of specific post operative complications has a special relevance not only to Kerala but for the nursing community all over the world.

A preliminary review of the literature showed that there are large number of minor and major complications for valve replacement surgery which often have economic impact on the hospital (health provider) and the family of the patient because of increased hospital stay, residual morbidity, from the disease or procedure, long term medications, inability to work and also social, behavioural and psychological problems. These complications can be classified as preventable and non preventable. A list of known medical complications and their classification is given below.
Table 2
Details of valve replacements related complications (Prevalence)

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Name of complication</th>
<th>Author Year of prevalence</th>
<th>Author Year Prevalence</th>
<th>Author Year Prevalence</th>
<th>Author Year Prevalence</th>
<th>New York University Medical School</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Embolism</td>
<td>AVR 1997</td>
<td>MVR 1996</td>
<td>Shapire Oz.M. 1994</td>
<td>Food and drug administration USA</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Anticoagulant related haemorrhage</td>
<td>2.3%</td>
<td>2.2%</td>
<td>2% (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Thrombo embolism haemorrhage</td>
<td>0.7% (2)</td>
<td>0.3% (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Endocarditis</td>
<td>(0)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>All complications</td>
<td>3% (11)</td>
<td>24% (12)</td>
<td>11.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Death</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Reoperation indicated in Post operative bleeding sternal infection Sternal dehiscence Pericardial effusion</td>
<td></td>
<td></td>
<td>4% (2)</td>
<td>2% (1)</td>
<td>4%(2)</td>
</tr>
<tr>
<td>8.</td>
<td>Heart block</td>
<td></td>
<td></td>
<td>2% (1)</td>
<td>4%</td>
<td>2% (1)</td>
</tr>
<tr>
<td>9.</td>
<td>Pulmonary embolism</td>
<td></td>
<td></td>
<td>2% (1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Aortic</td>
<td>28-74%</td>
<td>11.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>Mitral</td>
<td>27-71%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Aortic and mitral</td>
<td>18-47%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Surgery</td>
<td>12-32%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Death</td>
<td>2-5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Renal failure</td>
<td></td>
<td></td>
<td>3.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Sepsis</td>
<td>3.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Pneumonia</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Wound infection</td>
<td>0.7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Stroke</td>
<td>2.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following complications which can be possibly prevented by educational intervention were selected for the study. Now this could be achieved by carrying out the educational intervention. (Appendix 4 or 5)

1. Lower respiratory tract infection
2. Pleural cavity infection
3. Psychological mal adjustment
4. Deep vein thrombosis
5. Wound infection
6. Sub acute bacterial endocarditis

A paper on complications of aortic valve replacement by Cardiology Division, Department of Medicine, Department of Surgery, New York University, School of Medicine, USA in aortic valve replacement, the results showed that median length of stay was 8 days. There were no intraoperative deaths. 10 patients (6.5%) died in the post operative period. Stroke occurred in 4 (2.6%), sepsis in 5(3.3%) renal failure in 5 (3.3%), pneumonia in 3 (2%), and wound infection in 1 (0.7%).
In a study on nutritional and immunological state of patients undergoing heart valve surgery were studied. A series of 60 patients treated by heart valve replacement surgery results under extracorporeal circulation were reviewed. Poor nutrition was reserved in 28% of these cases, the cardiac index in these patients being significantly smaller than in operated patients with normal nutritional states (2.07±1.0-0.8 as against 2.46±1-0.7, p less than 0.01). Furthermore, 58% of those with poor nutrition presented post operative complications: mediastinitis, wound infection, ventricular arrhythmias or secondary pulmonary infection. One death occurred in this group. Post operative complications in patients with normal nutritional states developed in only 6% and there were no deaths.

In another study on risk factors for severe bacterial infections after valve replacement and aorto coronary by pass operations showed that severe infection occurred after valve replacement and it was 9.5%.

Using the Euroscore database information on 98 variables regarding risk factors, procedures and outcome were collected for 5,672 patients undergoing valve surgery under cardiopulmonary bypass in 128 European centers in the 1990s. The findings showed that aortic valve stenosis was the most common diagnosis (47.6%), whilst mitral valve surgery accounted for 42% of procedures.
One of the predictive factors for early mortality was active acute endocarditis (P=0.0001).

A study done on left ventricular function and valvular reoperation it was mentioned that the incidence of acute endocarditis is 0 to 9%.

A study done on Department of Surgery, Harvard Medical School, Boston acute bacterial endocarditis continues to be a condition with high morbidity. Although the majority of patients are treated by high dose antibiotics, a high risk patient group requires surgical intervention, which is the subject of this article. Methods and results showed that: from 1972 to 1991, 3,820 patients underwent heart valve replacement at the Brigham and Women's Hospital, Boston. Of this group, 158 patients underwent surgery for acute bacterial endocarditis. 109 had native valve endocarditis (NVE), and 49 had prosthetic valve endocarditis (PVE). There were 108 men and 50 women with a mean age of 49 years (range, 16-99 years), 64% were New York Heart Association functional class II or III. In both NVE and PVE groups, streptococcus and the predominant infecting agent uncontrolled sepsis, progressive congestive failure, peripheral emboli, and echocardiographically demonstrated vegetations were the most common indications for surgery. 85% of patients had a single valve procedures, 15% had a multivalve procedure, and 34 patients had other
associated major cardiac procedures. The operative mortality was 6% in NVE and 22% in PVE. Long term survival at 10 years was 66% for NVE and 29% for PVE. Freedom from recurrent endocarditis at 10 years was 85% for NVE and 82% for PVE. The main factors associated with decreased survival overall were PVE and non streptococcal infection. The morbidity and mortality after surgical treatment of acute endocarditis depend on the site, the severity, and the subject infected. Early aggressive surgical intervention is indicated to optimize surgical results, especially in patients with non streptococcal infection or PVE.

In the study on psychological distress among recipients of Bjork-Shiley convexo-concave (Bssc) valves: the impact of information came to the conclusion that psychological distress between recipients of Bssc valves and Sorin valves did not differ irrespective of whether the recipients knew their valve type. So all should be well informed about their valves to avoid psychological distress.

Study of the long term psychological consequences of heart valve prosthesis come to the conclusion as follows;

The present follow-up period of cardiac surgery allows assessment of the long term consequences of valvular prosthesis, the short term consequences having already been the object of many studies. 50 patient of both sexes,
operated on for aortic or mitral valve disease between 1973 and 1974 were interviewed to assess their degrees of psychological adaptation. The position of the prosthetic valve (aortic or mitral) seemed to be of little importance and the prognosis depended rather on sex, age at operation, previous personality, intelligence quotient, post operative complications and the interval between diagnosis of the disease and operation.

A study done in the Division of cardiothoracic surgery, New York University Medical Centre, New York 10016, USA on valve surgery the operative mortality rate for all mitral valve surgery was 3.5%. The operative mortality rate of isolated aortic valve patients was 5.7%. For the total group the operating mortality was 4%. Early complications for mitral valve patients included reoperation for bleeding or tamponade in 4.4%, myocardial infarction in 1.2% and transient ischemic attack and wound infection in 0.1% each.

1.3 STATEMENT OF THE PROBLEM

Effect of educational intervention on the prevention of specific postoperative complications in patients who undergo valve replacement surgery in Medical College Hospital, Thiruvananthapuram.
1.4. OPERATIONAL DEFINITIONS

1. Effect

Effect is the outcome of intervention done during the study. In this study, effect implies prevention of specific postoperative complications in patients who have undergone valve replacement surgery.

2. Educational Interventions

In this study, educational interventions are defined as planned activities to provide knowledge, practice and develop attitudes. They include teaching to prevent specific post operative complications, namely knowledge regarding surgery, deep breathing, steam inhalation and coughing exercises, providing instruction and emotional support, Intensive Care Unit (I.C.U) orientation, early ambulation, anticoagulant use, asepsis, how to support the incision during coughing, responding to anxiety and reassuring the patients.

3. Specific post operative complications

In this study specific post operative complications refers to serious complications which can occur in concurrence with cardiac surgery, such as lower respiratory tract infection, pleural cavity infection, psychological
maladjustment, deep vein thrombosis, wound infection, and subacute bacterial endocarditis which could be prevented by educational interventions.

3.1 Lower respiratory tract infection: In this study it was considered as an inflammatory process in lung parenchyma usually associated with a marked increase in interstitial and alveolar fluid. Lower respiratory tract infection includes bronchitis, bronchiectasis, pneumonia, every infection below trachea including parenchyma.

3.2 Pleural cavity infection: A pleural cavity infection include pleural effusion or any infection with an accumulation of fluid in the pleural space.

3.3 Psychological maladjustment: Can be due to any one or a combination of sleep disturbance, anxiety and / or depression.

3.4 Deep vein thrombosis: The formation of a thrombus in one of the deep veins of the body. Generally occurs in the lower extremities.

3.5 Wound infection: Break in the continuity of the skin and allow organisms to gain access to tissues and to such wounds where agents cause infection.

3.6 Subacute Bacterial Endocarditis (SBE): is a bacterial infection that produces growth in the endocardium. SBE is usually caused by viridens.
4. Patient

Persons suffering from valve disorders and admitted to hospital for valve replacement surgical intervention to correct the condition.

5. Valve replacement surgery

Excision of defective mitral valve or aortic valve or both and replacement with mechanical heart valves such as caged ball, tilting disc and bileaflet. The trade names corresponding to each type are Starr Edwards, Med-tronic Hall and St.Jude.

1.5 HYPOTHESIS

Educational intervention pre operatively will prevent specific post operative complications in patients who undergo heart valve replacement.

1.6 ASSUMPTION

Patients' awareness, practice and attitude regarding prevention of specific complications will prevent specific post operative complications.
1.7 OBJECTIVES OF THE STUDY

This is designed with the following objectives.

1. To administer an educational intervention before the surgical intervention with a pretest and post test to improve the knowledge, attitude and practice (KAP) of the patient about the surgical process, and thus reduce / prevent specific post operative complications.

2. To compare the effect of educational intervention in the test group and control group.

1.8 LIMITATIONS OF THE STUDY

1. This study is to be confirmed by other studies with other researchers so that it can be generalized.

2. Time for data collection was not sufficient since for each patient from the date of 2\textsuperscript{nd} day of admission till discharge he was followed, hence only 40 cases could be included in this study.