



Conquering Heart Diseases in the Himalayan Region  
International Conference (16-17 October 2011)  
Special Issue

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### **Printed at**

New Dhulikhel Printing Press

Dhulikhel, Kavre, Tel : 011 490640, E-mail: byanju.krishna@yahoo.com

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Nepalese Heart Journal

# Editorial

## The Deadly Epidemic of Cardiovascular Disease

Bhatt YKD

Shahid Gangalal National Heart Centre

In a recent interview by the famous TV personality and senior producer of Kantipur TV Suraj Singh Thakuri, I was suddenly asked “doc why does everyone talk of heart and not about other organs of the body? Nobody says I give my liver or kidney to you, why heart and why so much ado about this organ.” Although this question appears to be just a means to initiate a conversation, it carries a lot of sense and delivers a concealed message.

Heart is the central organ of the body, supplying nutrients to all its parts; in other words, heart is responsible for keeping a person alive, healthy and functioning. Body will start malfunctioning even if the heart stops for a couple of seconds. Being one of the vital organs, it is the responsibility of an individual to keep heart healthy, hearty and functioning. Unfortunately, cardiovascular disease (CVD) has become a ubiquitous cause of morbidity and a leading contributor to mortality and morbidity in most countries. The emergence of the CVD epidemic in the developing countries during the past two to three decades has attracted very little comment and very little public health response.

It has been estimated that 5.3 million deaths attributable to CVD occurred in the developed countries in 1990, whereas the corresponding figure for the developing countries ranged between 8 to 9 million. Thus, in 1990 the developing countries contributed 68% of the total global deaths due to non communicable disease and 63% of world mortality due to CV diseases.

### Historic experience and observation

It has been the historical experience of the developed Countries that the CVD epidemic usually commences in members of the higher social classes, who are the first to change from a low-risk to a high-risk lifestyle, which is characterized by diets rich in fat and calories, sedentariness, and smoking. Later, the risk permeates across the social spectrum, affecting all classes. The higher-social classes are, again, the first to respond to the knowledge of risk factors and the message of prevention. They are the ones who will begin the preventive measures and respond to it early and avail the benefit of preventive programme. Many a times, generations are lost in this realization. In

the developed countries, the Cardiovascular Diseases have risen and have started to decline gradually. The rise and recent decline of the CVD epidemic in the developed countries have been well documented.

The identification of major risk factors through population-based studies and effective control strategies combining community education and targeted management of high risk individuals have contributed to the fall in CVD mortality rates (inclusive of coronary and stroke deaths) that has been observed in almost all industrialized countries. It has been estimated that during the period 1965 to 1990, CVD related mortality fell by 50% in Australia, Canada, France, and the United States and by 60% in Japan. Other parts of Western Europe reported more modest declines (20% to 25%). The decline in stroke mortality has been more marked compared with the decline in coronary mortality. In the United States, the decline in stroke mortality commenced nearly two decades earlier than the decline in coronary mortality and maintained a sharper rate of decline. During the period 1979 to 1989, the age-adjusted mortality from stroke declined in that country by about one third, whereas the corresponding decline in coronary mortality was 22%.

### Lifestyle Changes

Adverse lifestyle changes accompanying industrialization and urbanization has contributed to higher prevalence of coronary heart disease (CHD) and Cardiovascular disease. Lack of exercise, adverse food habits have definitely led to higher levels of body mass index, blood pressure, fasting blood lipids (total cholesterol, ratio of cholesterol to HDL cholesterol, triglycerides), and diabetes. All of these being risk factors for CVD. The natural physical exercise associated with rural lifestyle is lost as a society develops into an urban one. Studies have clearly revealed that average body mass index of rural population is much lower than then the urban counterpart.

### Tobacco Trends

The increasing use of tobacco in a number of developing countries will also translate into higher mortality rates of CVD, lung cancer, and other tobacco-related diseases. The rising tobacco consumption patterns in most developing

countries contrast sharply with the overall decline in the industrialized nations. Recent projections from the World Health

Organization suggest that, by the year 2020, tobacco will become the largest single cause of death, accounting for 12.3% of global deaths. India, China, and countries in the Middle

Eastern area will by then have tobacco contributing to 12% of all deaths. In India alone, the tobacco attributable toll will rise from 1.4% in 1990 to 13.3% in 2020.

A large component of this will be in the form of cardiovascular deaths. I am sure this is applicable to our country also. Various anecdotal reports have shown a smoking prevalence of 16- 74% in different parts of Nepal. Tobacco is the leading avoidable cause of death worldwide, and its rising consumption in the developing countries warrants early and effective public health response. In a small study in referral hospital in Kathmandu it was seen that 55.5% of the individuals who had Myocardial Infarction were smokers.

### Coronary artery disease

In United States, there are one million deaths each year and half of it is due to Coronary Artery Disease (CAD). 1.5 million suffer from myocardial Infarction each year.

Coronary artery disease is not only a deadly disease, it may also be a devastating disease as it has a tendency to strike at the peak of ones working carrier. 45% of the Myocardial Infarctions (MI) occur below the age of 65years. 2/3 rd of the people who have MI survive and 1/3 do not. Among the 2/3<sup>rd</sup> who survive, 2/3 do not make a full recovery. It has been seen that 37% of American males and 29% females who die of MI are below the age of 55.

### Contributors of fall in CVD in west

As previously stated CVD is on the fall in the western world and is affecting age group which is much elder to those in the developing world. The incidence of CVD deaths below the age of 70 years is 46.7% in the developing world as compared to 26.5% in the developed world.

The major contributor of fall in CVD in the west is the effective control strategies.

At first the risk factors of CV diseases and their prevalence in the country was estimated and evaluated. Studies like the Framingham study well established the relationship between various groups of age, sex and the risk factors. This clearly brought forward the average risk of an individual to various CV diseases. As this education was propagated, the educated higher socioeconomic society, responded dramatically. Community education along with focus on the high risk individuals further added in the success in the fall in CV diseases.

Coronary Artery disease (CAD) death rate fell 54% from 1963 to 1990 in US. Between 1982 to 1992, there was 31% decline in Myocardial infarction deaths. Similarly there has been a decline in smoking by 37% since 1965. The annual death rate from Hypertension decreased from 56/100,000 in 1965 to 6.5/100,000 in 1991. Average plasma Cholesterol has declined from 220 to 205 mg% in age 20 to 74 yrs between 1960 and 1991.

### Tragedy with developing countries

The tragedy with the developing countries is very tragic. According to World Health Organization, 30 % of global death in 1998 was due to Cardiovascular Disease, 15.3 million lives were lost that year. It is interesting to note that low and middle income countries contributed 78% of the deaths demonstrating the gravity of the problem in these regions.

It has been estimated that the developing countries contribute 84% of the world's population and 93% worldwide burden of disease. On the other hand the developing countries generate only 18% of global economy and account for only 11% of global health spending. The projected rise in CVD mortality in India and possibly in the subcontinent is 103% in men and 90% in women from 1985 to 2015. By 2015, CVD would account for 34% of all male and 32% of all female deaths.

The estimated rise in Coronary Artery disease by 2020 in the developing countries is 137% and 120% in men and women respectively compared to 48% and 29% in the developed countries. The stroke burden would rise by 124% and 107% in men and women compared to 56% and 28% in developed countries. As can be visualized, this healthcare and economic burden is beyond the scope of most developing countries.

### CVD scenario in Nepal

In Nepal the incidence and prevalence of CVD has not been well defined. There are few studies which have shown statistics in certain group of people or in a certain region of the country but the national data is nowhere in the horizon. It has been seen that the prevalence of Hypertension is around 20%, Rheumatic Heart disease is 1.1/1000, Metabolic syndrome 12.4% and Coronary artery disease around 5% (in Kathmandu).

Thus, the new century dawns on a period of challenge an opportunity for the developing countries as they embark on their efforts to quell the emerging epidemic of CVD. National and international efforts must be coordinated to recognize this epidemic and respond without delay.

As an educated responsible individual of the country, it is not only our duty to be aware of the cardiovascular risk factors and be the early responders to it, but also to promulgate the knowledge of CVD and its prevention in the society.



# Prediction of Cardiovascular Disease in suburban population of 3 municipalities in Nepal

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## Abstract

### Background

Cardiovascular disease (CVD) is a major cause of morbidity and mortality throughout the world including Nepal. The assessment of risk factors responsible for CVD can predict 10 year risk of CVD. World Health Organization (WHO) risk assessment chart, specially designed for South East Asia Sub-region D can predict the risk of CVD in Nepal.

### Method and Materials

A total 532 study population from Panauti, Banepa and Dhulikhel were calculated their 10 year risk of CVD using WHO/ISH risk prediction chart on the basis of risk factors: age, gender, smoking status, diabetes, systolic blood pressure and total cholesterol.

### Result

Ten year risk of developing cardiovascular disease is less than 10% among the population less than 50 years, irrespective of gender. 5% of male population had more than 10% chance of developing cardiovascular events in next ten years. One third of 60 – 69 years people had more than 10% chance of developing cardiovascular disease whereas it increased to 50% among 70 years and older group.

### Conclusion

The assessment of risk factors is quite easy and cheap tool to predict the cardiovascular event, which support to practice the good clinical management to prevent the cardiovascular morbidity and mortality.

### Introduction

Cardiovascular diseases (CVD) are a major cause of morbidity and mortality throughout the world. Cardiovascular diseases are increasing rapidly in the developing world.<sup>1</sup> With the development of diagnostic facilities and health care awareness in urban areas of Nepal, the numbers of cardiovascular diseases are increasing in trend according to different hospital data. The underlying pathology atherosclerosis, which develops over many years and is usually advanced by the time symptoms occur, generally in middle age. Coronary artery disease and cerebrovascular disease frequently occur suddenly and are often fatal before medical care can be given.

There are number of established measurable risk factors precede the cardiovascular events which are modifiable as well. Quantification of risk factors is particularly useful for the identification of high risk who are most likely to benefit from clinical management of risk factors<sup>2</sup>. Modification of such risk factors has been shown to reduce mortality and morbidity in people with diagnosed or undiagnosed cardiovascular disease.<sup>1</sup>

Assessment of risk factors can predict the future cardiovascular events. Since most of the risk assessment like Framingham Risk Score, British Society Chart, European Society of Cardiology, Coronary Risk Chart is mostly based upon the Caucasian population, which may not be exact with Asian population like Nepali. World Health Organization published the guidelines for assessment and management of cardiovascular risk for prevention in 2007, which is designed for South East Asia<sup>2</sup>. This study was done to assess the risk factors to predict ten year risk of cardiovascular event in suburban population of Nepal using WHO/ISH risk assessment chart.

### Method and Materials

A total of 930 people of more than 40 years from Panauti, Banepa and Dhulikhel Municipalities were selected from the voter list with stratified random sampling. They were visited in their home to take consent and study in fixed clinic in respective ward. Among them, 585 visited the pre-informed fixed clinic for study. They were called in overnight fasting for 12 hours to check fasting blood glucose and total cholesterol. They were interviewed and examined by trained medical doctors and paramedics.

Blood pressure was measured using a standard mercury sphygmomanometer on the left arm after 5 min rest with the subject in the sitting position. The first and fifth phase of Korotkoff sounds were used for systolic (SBP) and diastolic blood pressures (DBP), respectively. Two independent measurements were taken with a minimal interval of

10 min. Dry chemistry tests was used to measure total cholesterol (TC) and fasting blood sugar level using the Accutrend GC system (Accutrend GC<sup>®</sup>, Roche Diagnostics, Germany). In selected cases, an electrocardiogram (ECG) was recorded based on the discretion of the physician in order to confirm coronary heart disease.

The study population having history of established coronary artery disease, myocardial infarction, cerebrovascular disease, coronary revascularization and peripheral vascular disease were excluded for analysis to assess risk factors for future cardiovascular events. The total eligible 532 data was analyzed using SPSS 13.

The following risk factors were used to predict the future cardiovascular events,

- ◆ Age
- ◆ Gender
- ◆ Smoking
- ◆ Systolic Blood Pressure
- ◆ Diabetes
- ◆ Total Cholesterol

Diabetes was defined when they were already diagnosed and/or taking antidiabetic medicine or fasting blood glucose more than 126 mg/dl.

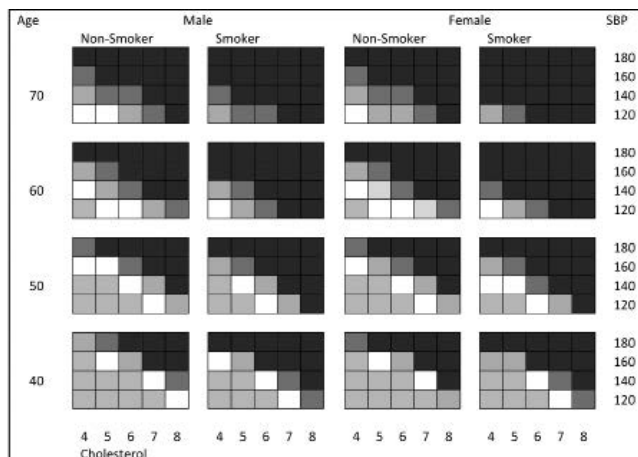
WHO/ISH risk prediction chart was used to analyze the data to predict future CVD events. The charts indicate total 10 year risk of a fatal or non fatal cardiovascular events (myocardial infarction or stroke), according to age, sex, blood pressure, presence or absence of diabetes, smoking status and cholesterol level for the WHO Region of South East Asia Subregion D which include Nepal<sup>2</sup>.

The 10 year risk is categorized into 5 subgroups;

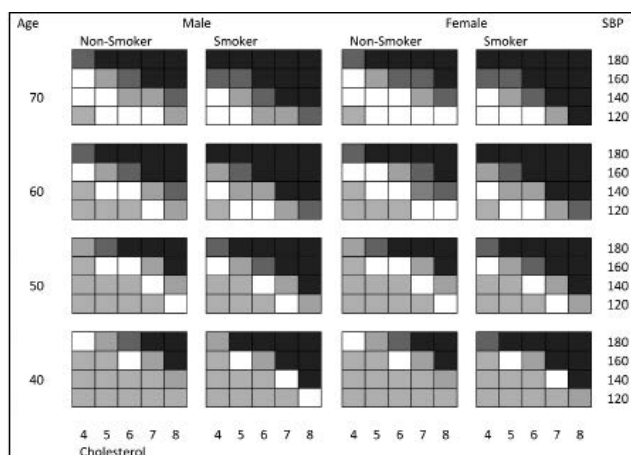
- ◆ less than 10%,
- ◆ 10 – 19.9 %,
- ◆ 20 – 29.9 %,
- ◆ 30 – 39.9 %,
- ◆ ≥ 40 %.

### 10 Year Risk Prediction Chart

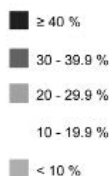
For People with Diabetes Mellitus



For People without Diabetes Mellitus



Key to risk level



### Results

A total 532 populations were analyzed for 10 year risk of fatal or nonfatal cardiovascular events according to WHO/ISH risk prediction chart. Majority of the study populations were 40 – 59 age group with about 51% of female. 29.3% of them were smoker and 3.4%, diabetic and 24% were hypertensive. Majority of them had less than 4 mmol/l fasting cholesterol.

Table 1: Percentage of population with individual risk factors

Age (in Years)	
40 – 49	(207) 38.9 %
50 – 59	(169) 31.8 %
60 – 69	(128) 24.1 %
70 above	(28) 5.2 %
Gender	
Male	(261) 49.1 %
Female	(271) 50.9 %
Smoking Status	
Smoker	(156) 29.3 %
Nonsmoker	(376) 70.7 %
Diabetes	
Diabetic	(18) 3.4 %
Nondiabetic	(514) 96.6 %
Systolic Blood Pressure (in mmHg)	
120	(406) 76.3 %
140	(94) 17.7 %
160	(25) 4.7 %
180	(7) 1.3 %
Total Cholesterol (in mmol/l)	
4 and less	(442) 83.1 %
5	(64) 12 %
6	(17) 3.2 %
7	(8) 1.5 %
8	(1) 0.2 %

Table 2: Smoking status

	Smoker	Nonsmoker
Male	(100) 38.3 %	(161) 61.8 %
Female	(56) 20.7 %	(215) 79.3 %

The risk was calculated using the risk prediction chart on the basis of all 6 individual risk factors. Ten year risk of developing cardiovascular disease is less than 10 % among the population less than 50 years, irrespective of gender. 5 % of male population had more than 10% chance of developing cardiovascular events in next ten years. One third of 60 – 69 years people had more than 10% chance of developing cardiovascular disease whereas it increased to 50 % among 70 years and older group.

Table 3: Proportion of the study population in different risk category with (n = 532)

Risk Category	Male Population			
	Age group (in Years)			
	< 50	50 - 59	60 - 69	70 +
< 10%	(97) 100%	(76) 95%	(50) 76.90%	(9) 47.40%
10 - 19.9%		(3) 3.80%	(11) 16.90%	(9) 47.40%
20 - 29.9%		(1) 1.20%		(1) 5.30%
30 - 39.9%			(3) 4.60%	
≥ 40%			(1) 1.50%	

Female Population

Risk Category	Age group (in Years)			
	< 50	50 - 59	60 - 69	70 +
< 10%	(110) 100%	(89) 100%	(46) 73%	(4) 44.40%
10 - 19.9%			(12) 19%	(2) 22.20%
20 - 29.9%			(2) 3.20%	(1) 11.10%
30 - 39.9%			(2) 3.20%	(1) 11.10%
≥ 40%			(1) 1.60%	(1) 11.10%

### Discussion

Cardiovascular disease is preceded by measurable risk factors like age, gender, presence or absence of diabetes, smoking status, systolic blood pressure, cholesterol level. These risk factors have causative relation with atherosclerosis which is the basis of cardiovascular disease. The person having these risk factors are more likely to develop cardiovascular disease than those who do not have these risk factors. Although individual risk factor is related with cardiovascular event, the combined approach of risk factors can better predict the outcome.<sup>2</sup>

The burden of cardiovascular disease has been increasing in this part of world. The Indian subcontinent (including India, Pakistan, Bangladesh, Sri Lanka, and Nepal) is home to 20 percent of the world’s population and may be one of the regions with the highest burden of CVD in the world.<sup>3-5</sup> However, less attention has been paid to the enormous burden of CVD in this region.<sup>6</sup>

In 2007 WHO/ISH published the risk prediction chart for CVD for different WHO subregions. This provided a simple tool to do the risk prediction for CVD. This is particularly of great use for the low-income settings as in the South East Asia Region. This chart uses the risk factors of age, gender, smoking status, diabetes mellitus, systolic blood pressure and cholesterol level. These risk factors are easily available to be assessed in low income countries as well. Ten year risk of cardiovascular event in 532 people of suburban areas of Nepal has been calculated using this chart.

The risk of development of cardiovascular event in 10 years is less than 10% among the age group less than 50 years. This age group was found to have no risk factor or single risk factor in most of the cases. This finding correlates with the WHO calculation that has shown that nearly 98% of the people of this age group will have less than 10% risk where as only 2% will have more than 10% risk of development of CVD in 10 years<sup>2</sup>.

Increasing age along with other risk factors causes more risk for cardiovascular event. 5% male people of 50 – 59 years age group has more than 10% risk of developing CVD events which is less than WHO calculation, which is about 17%. All female population of this age group has less than 10% risk.

More than 6% population of 60 – 69 years age group has more than 20% risk of CVD events. 55 % people of 70 years above have more than 20% risk for CVD event. 22% of female population of 70 years above has more than 30% risk of CVD event.

The risk category of the 60-69 and 70+ aged subjects in this study shows that, the proportion of people in higher risk groups is lower than that shown in WHO chart<sup>2</sup>. There is a relative dearth of studies done on this matter in this region. The differences in different communities and also in the people of urban, sub-urban and rural areas have not been studied so far. Larger multi-centric studies incorporating people from diverse socio-economic background will reveal more accurate findings that can be generalized to the population as a whole.

### Conclusion

The assessment of risk factors and risk prediction of CVD using the WHO chart is quite easy and cheap tool to predict the cardiovascular event. This also helps in the planning and implementation of preventive activities related to cardiovascular diseases. Although this study is from a small population of the adjoining three municipalities, this gives a small glimpse of the CVD risk scenario of Nepalese people. Though the findings can not be used to argue the overall case of Nepal, it definitely gives a ground that obviously a big proportion of the population may be exposed to the CVD risk factors, warranting an urgent need of actions to address this problem.

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## Primary Cardiac Tumours: Our Experience

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### Abstract

#### Introduction

Primary cardiac tumours are rare with autopsy incidence of less than 0.1 percent. We present our experience on surgical treatment of such tumours.

#### Methods

Since 2001, fifteen patients underwent surgical intervention for primary cardiac tumour at our centre. Mean age was  $46.5 \pm 17.5$  years (range 20 to 73 years). There were eight female patients. Thirteen patients had atrial myxoma and the remaining two had primary malignant tumours. Surgical excision of the tumour was done under cardiopulmonary bypass and cardioplegic cardiac arrest.

#### Results

Complete excision was possible in all benign cardiac tumours where as excision was possible in only one of the two malignant tumours. One patient with suspected angiosarcoma had biopsy taken from the heart. There was no operative mortality. All the patients with atrial myxoma were symptom free and free of recurrence on follow-up echocardiography. The patient with suspected angiosarcoma (histopathology was reported as hemangioma only) presented with disseminated disease and metastasis to thoracic spine with paraplegia three months postoperatively. The other patient with rhabdomyosarcoma who had complete excision of tumour followed by repair of the defect is currently on adjuvant chemotherapy.

#### Conclusion

Surgical excision of primary benign cardiac tumours is possible with excellent surgical outcome where as outcome is guarded in primary malignant cardiac tumours.

#### Key Words

Cardiac tumours, Myxoma, Rhabdomyosarcoma, Angiosarcoma

## Introduction

Primary cardiac tumours are rare with an autopsy incidence ranging from 0.001 % to 0.03%<sup>1</sup>. Modern cardiac imaging transformed primary cardiac tumours from a condition rarely diagnosed before autopsy to a curable form of disease<sup>2</sup>. About 2/3<sup>rd</sup> of all primary cardiac tumours are benign and among them atrial myxomas are the most common<sup>3</sup>. Primary cardiac tumours present with a variety of symptoms like arrhythmia, embolization, dyspnoea or sudden death determined by intracardiac location of the tumour<sup>4</sup>. Transthoracic echocardiography is usually diagnostic<sup>5</sup>. Sometimes Transesophageal echocardiography, Magnetic Resonance Imaging and Computed Tomography studies are needed for the diagnosis<sup>6</sup>. Treatment modality depends on the type of the tumour. Surgical excision is indicated in all myxomas. The prognosis of primary malignant tumours is very poor even in cases where surgical excision is possible<sup>7,8,9</sup>. The goal of surgical excision in sarcomas should be complete resection with preservation and restoration of normal cardiac function since median survival of patients with complete resection of tumour is higher than those with incomplete resection<sup>7</sup>. Adjuvant radiotherapy and chemotherapy has been reported to prolong survival and help in palliation.

We present our surgical experience of 15 cases of primary cardiac tumours since 2001.

## Patients and Methods

Since 2001, fifteen patients underwent surgical intervention for primary cardiac tumour at our centre. Demographics, clinical presentation, diagnostic data, operative data, post operative and follow up data were collected from the patient's medical records and reviewed.

Mean age of the patients was 46.5 ±17.5 years (range 20 to 73 years). There were 8 (53.3%) female patients. There were 13 patients with atrial myxoma of which two were right sided tumours. Two patients had primary malignant tumour, a rhabdomyosarcoma and a suspected angiosarcoma.

## Preoperative evaluation

The preoperative symptoms were dyspnoea (60%), palpitation (53.3%), embolism (6.7%), recurrent pericardial effusion (6.7%), and incidental finding on routine examination (13.3%). Majority of the patients with dyspnoea were in New York Heart Association (NYHA) class II. None of the patients with myxoma had family history of myxoma or fell into the group of Carney's complex.

Routine hematological, biochemistry, chest X-ray and

electrocardiographic studies were performed in all patients for preoperative evaluation. Diagnosis was made with Transthoracic Echocardiography (TTE) and Transesophageal Echocardiography (TEE) when needed. Average size of myxoma on Echocardiography was 5.2 ± 2.1 × 3.1 ± 1.4 cm. Ultrasound of the abdomen was done in patients with right sided tumours. Magnetic Resonance Imaging (MRI) was done on patients with malignant tumours. Coronary angiography (CAG) was performed in 4 patients. One patient had insignificant coronary lesion, another one had 90% stenosis of left circumflex artery and the remaining two patients had normal coronaries.

## Operative Procedure

All the fifteen patients underwent surgical intervention under urgent basis soon after the diagnosis was made.

## Myxomas

All the patients had complete excision of the tumour through median sternotomy under cardiopulmonary bypass and cold blood cardioplegic cardiac arrest. The tumours were excised along with a wide margin of tissue surrounding the attachment of the tumour stalk to avoid recurrence. All the left sided myxomas were excised using biatrial approach while right sided ones were approached via right atrium only. The resulting defect in the interatrial septum (IAS) was repaired with pericardial patch in 9 (69.2%) patients and the remaining patients had direct closure.

Five patients underwent additional procedures for associated problems. Four patients had mitral valve repair for associated mitral regurgitation, one patient had tricuspid valve repair along with mitral and one patient underwent coronary artery bypass grafting.

The diagnosis of myxoma was histopathologically confirmed in all the cases.

## Malignant Tumours

Excision of the tumour was possible in only one of the two malignant tumours.

The patient, in whom surgical excision was possible, was a 24 years old female. The intraoperative findings were intratrial fleshy and fungating highly vascular tumour occupying almost whole of left atrium, arising from the left atrial roof and infiltrating the IAS, right atrial free wall and medial aspect of the superior Venacava (SVC). Pulmonary veins were free from tumour extension. She underwent surgical excision of tumour and mitral valve repair through

median sternotomy under cardiopulmonary bypass and cardioplegic cardiac arrest. The tumour along with roof of left atrium, 2/3<sup>rd</sup> of anterior and medial wall of SVC, whole of IAS and adjacent medial free wall of right atrium were excised. Left atrium reconstruction along with closure of IAS defect was done with pericardial patch. Right atrioplasty and reconstruction of SVC with right atrial appendage was done. The histopathological diagnosis of the tumour was rhabdomyosarcoma.

The other patient, a 26 years old male who presented with recurrent pericardial effusion had operative finding of 2.5 litres of hemorrhagic fluid in the pericardium and multiple highly vascular nodules all over the heart surface. Excision was not possible and biopsy of the tumour with creation of bilateral pericardio-pleural window was done. Histopathology was reported to be hemangioma only but he presented with disseminated disease only 3 months later.

### Results:

*Myxomas:* There was no operative or in-hospital mortality. One patient developed atrial arrhythmia in intensive care unit (ICU) post operatively and was managed with overdrive atrial pacing. Two patients needed inotropic support for 3 days. Average ICU stay was  $1.7 \pm 0.7$  days. The patients were discharged on an average 5<sup>th</sup> postoperative day (range 3–9 days).

Follow up data was available from 3 months to 5 years. All the patients were symptom free in NYHA class I and free of recurrence on follow up Echocardiography. Out of the 5 patients who had mitral valve repair, 3 patients do not have any mitral regurgitation (MR) while one has mild and the other moderate MR. No late mortality has been reported.

### Malignant Tumours

There was no operative mortality or complications. The patient with rhabdomyosarcoma is 4 months post surgery. She is in NYHA class I and does not have recurrence of tumour at 3 month's follow up Echocardiography. She is presently on adjuvant chemotherapy and radiotherapy.

The other patient with suspected angiosarcoma (histopathology was reported as hemangioma only) presented with disseminated disease and metastasis to the thoracic spine with paraplegia three months postoperatively. He was in NYHA class III – IV.

We will need a longer follow up to see the late survival.

### Discussion

Cardiac tumours of the heart are rare <sup>1-7</sup>. With improved cardiac imaging and the development of cardiopulmonary bypass to enable intracardiac surgery, cardiac tumours have changed from a postmortem curiosity to a readily diagnosed and frequently treatable form of disease <sup>7</sup>. Myxomas are the commonest benign cardiac tumours comprising approximately half of all benign tumours. Thirteen patients (86.7 %) in this series were benign tumours and all of those were atrial myxomas which is a higher incidence compared to other studies.

Most of our patients presented with Dyspnoea (60%) and palpitation (53.3%). Most of the other series also have reported these symptoms to be the main presenting complaints. However, the incidence of embolic events and neurologic symptoms (6.7%) were much lower than other series. The incidence of asymptomatic patients (13.3%) is similar to other reports <sup>6</sup>.

Among the malignant tumours, about 3/4<sup>th</sup> are sarcomas, the commonest being angiosarcoma followed by rhabdomyosarcoma <sup>3,6</sup>. The two patients in our series with malignant tumours were also suspected angiosarcoma (though the histopathology was reported as hemangioma only, looking at the operative finding and the fact that he developed metastasis to thoracic spine 3 months post op, we think it is angiosarcoma) and rhabdomyosarcoma. They presented with dyspnoea and recurrent pericardial effusion. Both of them had palpitation. Others have reported similar findings.

Echocardiography is most of the time diagnostic. TTE can determine the size, shape, location, attachment, number and mobility of a tumour. TEE and MRI is sometimes needed for the confirmation of the diagnosis. Ultrasound of the abdomen should be done in right sided tumours to exclude primary tumours in the abdomen.

Surgical excision is the only effective therapeutic option for patients with cardiac myxoma <sup>10</sup>. We use cardiopulmonary bypass and cardioplegic cardiac arrest through a median sternotomy for complete excision of the tumour. Some surgeons have started using minimal access surgery for the excision of myxomas with comparable results to other series <sup>2,11</sup>. We use biatrial approach for the left sided myxomas and right atrial approach for right sided tumours. We excise a part of the IAS or part of the atrial wall where the tumour is attached to avoid recurrence and repair the defect either with a pericardial patch (69.2%) or direct closure depending on the size of the defect. We feel that with biatrial approach, we can have adequate exposure and excise the tumour completely to minimize the recurrence. Some surgeons prefer only left atrial approach for the excision of left sided myxomas. So the optimal operative



approach to the atrial myxoma lacks uniformity.

Recurrence of cardiac myxoma is reported at around 3% to 5% in some series<sup>10,12</sup>. Recurrence has been related to incomplete excision, multi-focality and shedding of tumour fragments<sup>10</sup>. We do not have any recurrence of myxoma in our patients. This may be because our follow up is of shorter duration, none of the patients fall into Carney complex and we excise a cuff of normal atrial tissue at the stalk of the tumour.

The prognosis of patients with primary malignant cardiac tumours is poor with death occurring within 6 months postoperatively on average<sup>1</sup>. Malignant cardiac tumours tend to be diagnosed after they have become extensive and the patients already have a grave prognosis<sup>13</sup>. Many of those tumours may be curable if detected at an earlier stage<sup>13</sup>. The extensive involvement precluding resection or anatomic location hindering access for complete resection and reconstruction have made surgical results unsatisfactory regardless of the techniques used<sup>9,8</sup>. Moreover, it is not known whether adjuvant chemotherapy and radiotherapy may be beneficial in patients in whom "curative" surgery has been performed<sup>9,14</sup>. However, surgical resection of tumour should be tried for the definitive histological diagnosis, to relieve the intracardiac obstruction and allow time for effective adjuvant chemotherapy and radiotherapy. There are reports of increased survival in patients in whom surgical excision of tumour is possible compared to those where resection is not performed. In the two patients we had, we were able to excise the tumour only in one patient and she is currently on adjuvant chemotherapy and radiotherapy. The other patient, in whom the excision was not possible, has multiple metastases with a very bad prognosis. A longer follow up will tell us how the tumour will behave in future in those patients.

## Conclusion

Surgical excision of primary benign cardiac tumours is possible with excellent surgical outcome and is the procedure of choice. Although the outcome is guarded in primary malignant cardiac tumours, surgical excision should be tried whenever possible. The therapeutic approach should include surgery, chemotherapy and radiotherapy in the hope of achieving cure or long term palliation.

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# Electrocardiographic changes in Chronic Obstructive Pulmonary Disease patients with elevated Pulmonary Artery Systolic Pressure

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## Abstract

### Background

Chronic Obstructive Pulmonary Disease (COPD) is a common global problem and most common medical problem in Nepal having significant morbidity and mortality. One of the pathogenesis of COPD in long run is the elevation of Pulmonary Artery Systolic Pressure (PASP) leading to right heart failure. A simple investigation - an Electrocardiograph (ECG) is assessed to co-relate with elevated PASP measured by Echocardiography in COPD patients of Dhulikhel Hospital.

### Methods and Materials

A retrospective case control study of 342 COPD patients was done with assessment of ECG to co-relate with elevated PASP and with normal PASP. Data were analyzed using SPSS 17.

### Result

There was significant difference in mean age, P amplitude in Lead II, III and aVF, QRS axis and R wave in  $V_1$  and S in  $V_6$  between two groups.

### Conclusion

ECG changes are fairly sensitive and specific for elevation of PASP.

### Key Words

COPD, PASP, Electrocardiograph, Echocardiography

## Introduction

Chronic Obstructive Pulmonary Disease (COPD) is a common global problem. It has been estimated that COPD will rise from sixth rank as the cause of death in 1990<sup>1</sup> to third most common cause of death world wide by 2020<sup>1,2,3</sup>. According to a hospital based study, COPD is the most common medical problem in Nepal and has significant morbidity and mortality<sup>4</sup>. One of the pathogenesis of COPD in long run is the elevation of Pulmonary Artery Systolic Pressure (PASP) leading to right heart failure, reason for high morbidity and mortality<sup>5</sup>. PASP can be estimated correctly using echocardiography but unfortunately this is available only in few of tertiary hospitals<sup>6</sup>. It is expensive and requires highly specialized manpower. So in this study we try to look at a very simple investigation an Electrocardiograph (ECG) and co-relate this with the elevated PASP. ECG is simple, cheap, and available in most of the places and can be read even by the general physician.

## Methods and Materials

Patients who were admitted in medical ward of Dhulikhel hospital, Kathmandu university hospital with the diagnosis of COPD from January 1<sup>st</sup> 2010 till December 31<sup>st</sup> 2010 and who were indicated for echocardiographic study by the clinicians were selected retrospectively. Patients with PASP more than 30 mm Hg were taken as cases and those with less than 30 mm Hg were taken as control.

160 patients with PASP > 30 mmHg were identified and ECG was collected from each patient file. Similarly there were 182 patients with PASP < 30 mm Hg.

PASP was calculated according to TR Gradient<sup>6</sup>

$$4TR^2 + 10 \text{ mm Hg}$$

Echocardiogram is performed by either one of the two cardiologists present at Dhulikhel Hospital using TOSHIBA power vision 6000 echocardiography machine.

ECG was taken using the standard method and calibration of 25mm/s and 10mm/mv by the ECG technician. ECG in both the groups were analyzed by the cardiologist.

Statistical Analysis was done using SPSS 17.0. Student's t-test was done to compare between the two groups.

## Results

In patients with PASP > 30 mmHg, mean age is  $58.5 \pm 6.2$  and in patients with PASP < 30mmHg, mean age is  $54.5 \pm 5.5$  ( $p=0.01$ ). Number of female patients were more than male patients in both the group.

There was significant increase in P wave amplitude of

Lead II, III and aVF in elevated PASP group. Mean QRS axis was also increased significantly in PASP > 30 mmHg group ( $P=0.001$ ). Similarly R and S amplitude are also increased in elevated PASP group.

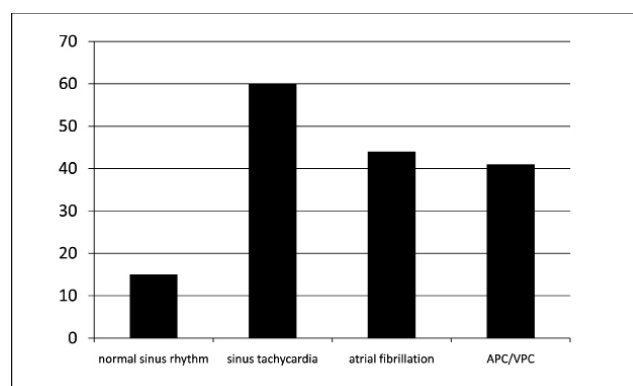
**Table 1 Difference in characteristic feature**

	PASP > 30 mmHg	PASP < 30 mmHg	P value
<b>Age</b>			
Mean (years)	58.5 ± 6.2	54.5 ± 5.5	0.01
Range (years)	42 - 86	40 - 76	0.03
<b>Sex</b>			
Male (%)	71 (44.4)	86 (47.3)	0.5
Female (%)	89 (55.6)	96 (52.7)	0.5
<b>Mean P wave amplitude</b>			
Lead II (mm)	3.1 ± 0.8	2.3 ± 0.6	0.01
Lead III (mm)	2.4 ± 0.7	1.9 ± 0.4	0.03
Lead aVF (mm)	2.6 ± 0.6	2.1 ± 0.5	0.03
<b>Frontal plane QRS axis (degree)</b>	129 ± 12.5	73 ± 8.5	0.001
<b>R amplitude in V<sub>1</sub> (mm)</b>	7.6 ± 1.3	1.2 ± 0.3	0.001
<b>S amplitude in V<sub>6</sub> (mm)</b>	18.0 ± 5.6	3.9 ± 0.9	0.02

Similarly P wave amplitude of more than 2.5 mm in lead II was 78.6% sensitive and 78% specific for elevated PASP. Complete RBBB was more specific (93.4%). Poor progression of R wave was neither sensitive (33.6%) nor specific (27.4%) for elevation of PASP group.

**Table 2 Sensitivity and specificity for different ECG characteristics**

ECG characteristics	PASP >30 mm Hg	PASP <30 mm Hg	Sensitivity %	Specificity %
P in lead II >2.5 mm	126	42	78.6	78.0
R in V <sub>1</sub> > 7 mm	116	32	72.5	82.4
R/S ratio > 1 in V <sub>6</sub>	112	35	70.0	80.8
Incomplete RBBB	106	82	66.3	54.9
Complete RBBB	52	12	67.5	93.4
Poor progression of R wave	54	132	33.6	27.4
T inversion in lead II,III, aVF	120	26	75.0	85.7
QRS axis >110 degree	127	38	79.3	78.0



**Fig 1 Rhythm in patients with PASP > 30 mm Hg**

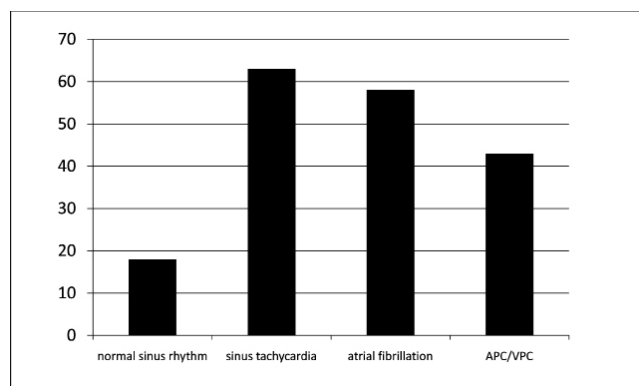


Fig 2 Rhythm in patients with PASP < 30 mm Hg

## Discussion

Pulmonary Artery Hypertension is a common complication of long standing COPD and is also a bad prognostic indicator<sup>5</sup>. ECG abnormalities corresponding with raised PASP is present in patients long before they have the symptoms of right heart failure<sup>7,8</sup>. Recent studies in rats and humans have illustrated that even a mildly increased right ventricular pressure load is associated with substantial changes in myocardial electrical properties, detectable in standard 12 lead ECG recording<sup>9,10</sup>.

In our study, we found that there was significant difference in P wave amplitude in lead II, III and aVF between the two groups. P wave amplitude in lead II > 2.5 mm was 78.6% sensitive and 78% specific for elevated PASP. However Ivor R. Henkens et.al. found it to be 30% sensitive and 91% specific<sup>10</sup>. P wave amplitude in lead II increases as result of progressive hypertrophy – associated diastolic dysfunction and RV dilatation leading to associated tricuspid regurgitation<sup>11</sup>. Karliner et al. documented increase in P amplitude in lead II in healthy men who ascended from sea level to height of 6300 meters above sea level on Mount Everest and suffered from hypoxia induced PAH<sup>11</sup>. Our study being at hilly area is probably the reason for being more sensitive and less specific compared to that of Ivor R Henkens.

Height of R wave in  $V_1$  was 72.5% sensitive and 82.4% specific where as Henkens et al. found 53% sensitive and 94% specific<sup>12</sup>. Similarly R/S ratio > 1 was 70% sensitive and 80.8% specific. In Henkens et al. it is 51% sensitive and 98% specific. We found complete RBBB to be 66.3% sensitive and 93.4 % specific whereas Henkens et al. found it to be 18 % sensitive and 96% specific. Increased height of R wave , R/S ratio >1 in lead  $V_1$  and RBBB was found in yet another study by Henkens et al<sup>12</sup>. Poor progression of R wave was less sensitive and specific for elevated PASP, however T inversion in lead II, III and aVf was 75% sensitive and 85.7% specific.

QRS axis > 110 degree was 79.3 % sensitive and 78.0 % specific. Henkens et al found QRS axis >90 degree to be 84% sensitive and 96 % specific. Similar ECG changes are reported in other studies also<sup>13,14,15</sup>.

When abnormalities are present in an ECG it is helpful to establish diagnosis but diagnosis cannot be ruled out in absence of ECG abnormalities. Numanik et al. also has the similar view<sup>16</sup>.

## Conclusion

From this study we can conclude that recording 12 lead ECG is fairly sensitive and specific way to recognize elevated PASP in COPD patients. It can be used routinely in COPD patients as a screening purpose in cost effective manner. However whenever clinically required and echocardiogram is available, echocardiographic measurement of PASP is advised.

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## Allergic reaction to long – term Benzathine penicillin injection for secondary prevention of acute rheumatic fever and recommendations for skin testing.

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### Abstract

#### Background

Rheumatic Fever (RF) causes 25-40% of all cardio vascular disease in developing countries. Long term benzathine penicillin injection is being used for secondary prophylaxis of RF / RHD. Although allergic reaction to penicillin is rare skin testing is performed routinely before each and every penicillin injection delivery in most of the hospitals in Nepal.

#### Objectives

Objectives of this study was to evaluate safety of long term benzathine penicillin injection and establish recommendations for penicillin skin testing.

#### Methods

Data from the registers of National RF/RHD prevention and control programme from 32 hospitals of Nepal were collected and analyzed in a retrospective study.

#### Results

65 patients (1.4%) among 77300 injections of benzathine penicillin given to 4712 patients, had allergic reactions. 5 had anaphylaxis, an incidence of 0.1% (0.7/10000 injections), 60 had minor allergy, an incidence of 1.3%.

#### Conclusions

Life-threatening allergic reactions are very rare in patients on long-term intramuscular benzathine penicillin for secondary prevention of RF. With these rare complications, regular skin test before each and every benzathine penicillin injection delivery has no significant role. Nevertheless Skin testing is recommended before 1<sup>st</sup> injection and patients having different batch number and or brand name.

#### Key Words

Rheumatic Fever, Rheumatic Heart Disease, Inj. benzathine penicillin, Allergic reactions, Secondary prophylaxis

## Introduction

Rheumatic Fever (RF) causes 25-40% of all cardio vascular disease in developing countries<sup>1</sup>. Disability and death from Rheumatic Heart Disease (RHD) are mainly caused by recurrent attacks of RF<sup>2</sup>. The efficacy of antibiotic prophylaxis to prevent recurrences of RF has been known for over 70 years<sup>3,4</sup>. Because of the impact of this disease on public health, and the proven efficacy of antibiotic prophylaxis, the World Health Organization has helped to establish programmes for prevention of RF in developing countries<sup>5</sup>.

RF and RHD are common cardiac problem in Nepal with prevalence rate of 1.2/1000 children aged 5 – 16 years<sup>6</sup>. Long term benzathine penicillin injection is being used for secondary prophylaxis of RF / RHD.

Although allergic reaction to penicillin is rare skin testing is performed routinely before each and every penicillin injection delivery in most of the hospitals in Nepal. There are no published guidelines and recommendations for skin testing before penicillin injection delivery. Ministry of Health and Population of Nepal has been implementing a national programme on RF/RHD prevention and control with the technical support of Nepal heart foundation since last 4 years.

Objectives of this study was to evaluate safety of long term benzathine penicillin injection and establish recommendations for penicillin skin testing

## Methods

Data from the registers of National RF/RHD prevention and control programme from 32 hospitals of Nepal were collected and analyzed in a retrospective study. This enrolled 4712 RF/RHD patients from June 2007 to Feb 2010 who received 3 weekly benzathine penicillin injection for Secondary prevention of RF.

Analysis of the patients with allergic reactions to inj. Benzathine penicillin was done.

## Results

77300 injections of benzathine penicillin were delivered to 4712 patients during the study period. Among them 2172 (46.1%) were males and 2540 (53.9%) were females, 1728 (36.7%) were under 18 years and 2994 (63.3%) were above 18years. 665( 14.1%) were RF and 4141 (85.9%) were RHD.

65 patients (1.4%) had allergic reactions. 5 had anaphylaxis, an incidence of 0.1% (0.7/10000 injections), 60 had minor allergy, an incidence of 1.3%. Among them 10 patients had minor allergy while receiving new batch of benzathine

penicillin (incidence of 0.2%) and 18 patients had minor allergy with new brand of injection penicillin ( change from Penidure LA to Pencom ) an incidence of 0.4%. There were 8 vasovagal reactions (0.16%) ( Table 2 ). Among them 6 were with severe RHD. No death was reported. All allergic reactions occurred in age group >18 Years.

Table 1				
Total patients - 4712				
Sex:	Male	2172(46.1%)	Female	2540(53.9%)
Age:	< 18yrs	1728(36.7%)	>18yrs	2994(63.3%)
Diagnosis:	RF	665(14.1%)	RHD	4047(85.9%)

Table 2	
Total patients	: 4712
Reaction to Penicillin	: 65 (1.4%)
Major	: 5 (0.1%), (0.7/10000 injections)
Minor	: 60 (1.3%), (8.4/10000 injections)
Vaso-vagal syncope	: 8 (0.16%)

## Discussion

The 1.4 % incidence of allergic reaction observed among patients with RF/RHD in our study differs from 3.2% incidence reported by International Rheumatic Fever Study Group<sup>7,8</sup> and also incidence of 2.24% reported in patients who received short term treatment with benzathine penicillin for sexually transmitted disease<sup>9</sup>.

Anaphylaxis is the most worrying allergic reaction to penicillin. The reported incidence of serious reactions among patients without a history of rheumatic fever or of penicillin allergy ranges from 1-4/10000 treatment courses<sup>10</sup>. In our study the 4 episodes of anaphylaxis among 4712 RF/RHD patients who received 77300 injections represent a frequency of 0.7/10000 injections. This shows the frequency of serious allergic reactions to penicillin to be rare. The risk of such allergic reaction in age group under 12 years is reported very low<sup>11</sup>.

Although skin tests for penicillin allergy are not recommended for patients without a history of such allergic reactions, it is possible that selective skin test with penicillin might further reduce the already low risk of a fatal reaction in patients with severe RHD. Patients with a positive skin test could receive an alternate prophylactic drug as Erythromycin.

It is necessary to note the batch number and brand name of the injection benzathine penicillin in the developing countries as ours because of the possible differences in quality of the drug with different manufacturers and batches.

### Conclusions

Life-threatening allergic reactions are very rare in patients on long-term intramuscular benzathine penicillin for secondary prevention of RF. Minor reactions to penicillin may also occur with change in batch number and brand. It is not beneficial to perform skin test before each and every benzathine penicillin injection delivery.

Skin testing is recommended before 1<sup>st</sup> injection and patients having different batch number and or brand name. Consent taking is recommended with all patients before 1<sup>st</sup> benzathine penicillin injection delivery for legal safety of health personal delivering the injection.

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# Radio Frequency Ablation of right sided accessory pathway - 8 years experience at SGNHC

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## ABSTRACT

### Background

Radiofrequency ablation has been established as the curative treatment for most of supraventricular tachycardia since 1987. In SGNHC, ablation has been done routinely since 2003. In our experience, right sided accessory pathway (AP) has been technically difficult and challenging with low success rate as mentioned in literature outside. So, the objective of this article was to analyze the demographic characteristics, success and recurrence rate and complication of right sided AP ablation in our centre.

### Methods and Materials

From 13<sup>th</sup> Oct 2003 to 9<sup>th</sup> Sept. 2011, altogether 768 patients who underwent ablation were analyzed.

### Result

Among 768 patients, 416(54.2%) were accessory pathways out of which 72(17.3%) were right sided AP. Majority of right sided accessory pathway were manifest (WPW) comprising 77.1%, significantly higher compare to left sided pathway where manifest AP was only 44.1 % ( $p < 0.001$ ). Among all attempted ablation of right sided AP, 11 ablations failed so that the success rate was 84.7% lower than that of left sided pathway where success rate was 98.4% ( $p < 0.001$ ). Among 61 successful ablations, 2 relapsed during follow up period, recurrence rate being 3.3%. Although there were few complications in the ablation of other tachyarrhythmia, there was no complication noted during the ablation of 72 right sided AP.

### Conclusion

Right sided pathway are mostly manifest. The success rate of right sided pathway is lower in comparison to left sided pathway. Our success rate is comparable to the result in the literature which indicates that ablation of right sided accessory pathway in our centre is reasonably good.

### Key Words

Right sided accessory pathway, Radiofrequency ablation

**Introduction**

The first radiofrequency catheter ablation of Supraventricular tachycardia in human was done in 1987<sup>1</sup>. Since then, it has been established as the curative treatment for most of the supraventricular tachycardias<sup>2-4</sup>. Conventionally, according to the anatomic location, the accessory pathway is divided into left, septal and right sided pathway<sup>5</sup> (Fig 1). Left and right sided pathways are further categorized as posterior, postero-lateral, lateral, antero-lateral and anterior accessory pathway. Septal pathway is categorized as postero-septal, mid-septal and antero-septal accessory pathway.

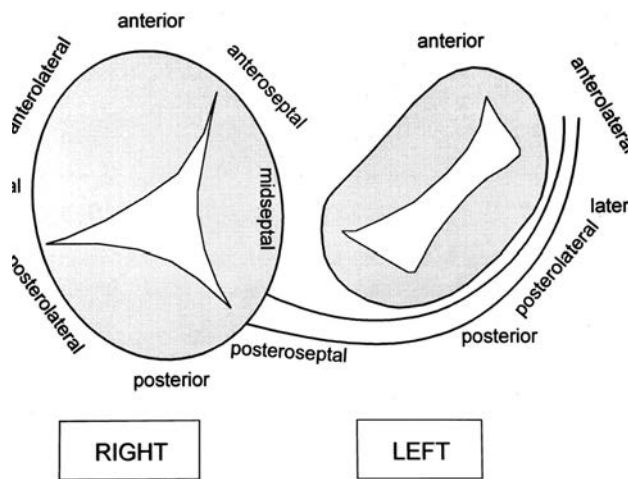


Fig 1. Localization of accessory pathway.

Literature shows that majority of right sided pathway have both antegrade and retrograde conduction so that right sided pathway mostly presents as manifest accessory pathway<sup>6</sup>. Apart from other factors, the probability of antegrade conduction also depend on the location of accessory pathway. In contrast to left sided AP, there is smaller interatrial distance for an impulse to conduct from sinus node to atrial input on the right sided AP so that there is greater chance to conduct antegradely via right sided AP<sup>6</sup>. Compare to left sided pathway, right sided pathway is technically difficult to ablate and is associated with lower success and higher recurrence rate<sup>7,8</sup>.

The reason behind this are<sup>9</sup>:

1. Important anatomic differences exist between the tricuspid valve annulus and mitral valve annulus. The folding over the right atrial wall to right ventricle creates an acute angle of attachment of the tricuspid valve annulus resulting in less room available for manipulation of catheter tip.

2. Unstable catheter positioning in tricuspid annulus.
3. Absence of reference electrode in the right side like Coronary Sinus electrode in left side.
4. Higher incidence of congenital abnormality e.g. Ebsteins anomaly in tricuspid valve annulus.

It is thus the reported success rate in different studies of right sided pathway ablation are about 80-90% lower than that of left sided pathway.<sup>7,8</sup>

The first ablation in our centre was done in 13<sup>th</sup> Oct. 2003. Since then, we have done ablation for various type of tachyarrhythmia, mostly AVNRT and AVRT and few VT, atrial flutter, Mahaim and atrial flutter. In the past 8 years, we experienced that the right sided accessory pathway ablation was technically difficult and the success rate low. So, in this article, we reviewed the efficacy and demographic characteristics of right sided AP ablation.

**Objective**

The objective of this article was to evaluate the demographic characteristics and the efficacy of right sided AP ablation.

**Materials and methods**

Three 6 Fr quadripolar catheters were placed in right atrium, His and right ventricle and one 6 Fr decapolar catheter was placed in coronary sinus. The ablation of right sided pathway was done via right femoral venous approach. All the patients who underwent ablation from 13<sup>th</sup> Oct 2003 to 9<sup>th</sup> Sept. 2011 were reviewed in this article. The data regarding age, sex, manifest vs concealed, outcomes like successful ablation, attempted ablation, failure and relapse were extracted from the EPS data form. SPSS 16 was used for statistical analysis.

**Result**

**Demographic Characteristics:** All together 768 patients had undergone radiofrequency ablation. Among them, 322 (41%) were AVNRT, 416 (54.2%) were Accessory pathway and remaining 30 (3.9%) were others including VT, atrial flutter, Mahaim and PJRT. Among 416 APs, right sided pathway comprised 72 (17.3%). The distribution of right sided AP in different location with success and recurrence is shown in table 1. In right sided pathway, mean age was 33.4 yrs, male being 58.4%. Although patients with AP has smaller age compared to AVNRT (35.9 vs 43.5 yrs, p<0.001), there was no difference in age among different location of accessory pathways.

**Table 1. AP distribution on right side with success and recurrence rate.**

Location	Number of AP (%)	Success (%)	Recurrence (%)
Right Anterior	3 (4.2%)	2 (66%)	0
Right antero-lateral	10 (13.9%)	8 (80%)	0
Right Free wall	36 (50%)	31 (86.1%)	2 (3.3%)
Right Postero-lateral	15 (20.8%)	13 (86.7%)	0
Right posterior	8 (11.1%)	7 (87.5%)	0
Total	72	61 (84.7%)	2 (3.3%)

**Concealed vs manifest:** Majority of right sided accessory pathway were manifest (WPW) comprising 77.1%. This no. was significantly higher compare to left sided pathway where manifest AP was only 44.1 % ( $p < 0.001$ ). There was no significant difference according to the location of right sided AP.

**Outcome:** There was no unattempted ablation of right sided pathway. Among all attempted ablation, 11 ablations failed so that the success rate was 84.7% lower than that of left sided pathway where success rate was 98.4% ( $p < 0.001$ ). Although not statistically significant, it was observed that more anterior the right sided AP was, lower the success rate; anterior 66% < antero-lateral 80% < free wall 86.1% < posterior-lateral 86.7% < posterior 87.5%. (Fig 2)

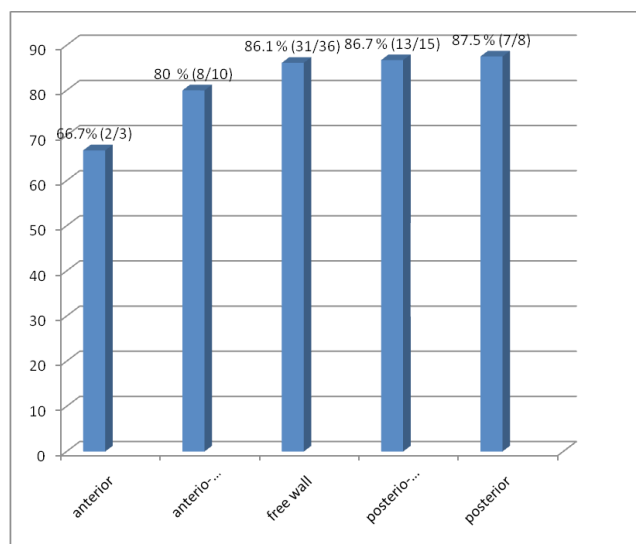


Fig 2. The success rate of right sided AP according to its location

**Recurrence:** Among 61 successful ablations, 2 relapsed during follow up period so that recurrence rate was only 3.3% much lower than that in the literature.

**Complication:** Although there were few complications in the ablation of other tachyarrhythmia, there was no complication noted during the ablation of 72 right sided AP.

## DISCUSSION

Majority of right sided pathway are manifest. As in the literature mentioned, it is due to the smaller distance for impulse to conduct from sinus node to right sided AP. Mean age is significantly lower compare to AVNRT. In our centre, the success rate was lower compare to left sided AP. We also found difficulty in mapping right sided AP as there was no reference electrode in right sided pathway like Coronary Sinus catheter in left sided pathway. Furthermore, the unstable ablation catheter made mapping and ablation more difficult. In our experience, more anterior the right sided AP was, more difficult to map and ablate and lower the success rate was. To maintain the catheter stability, we used long vascular sheaths like SR. Sometimes we used 7Fr ablation catheter for better support and stable positioning. Eventually, Our success rate was comparable to the various reported data in the literature.<sup>7,8</sup> This clearly indicate that ablation of right sided pathway in our centre, inspite of being technically difficult and challenging, has quite acceptable result.

## CONCLUSION

Right sided pathway are mostly manifest. The success rate of right sided pathway is lower in comparison to left sided pathway. Our success rate is comparable to the result in the literature which indicates that ablation of right sided accessory pathway in our centre is reasonably good.

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# Current Scenario of Heart Diseases in Nepal: At a glance

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## Abstract

### Background

Cardiovascular disease no more remains as a disease of developed countries. It is affecting developing countries as well. In addition, developing countries have big challenge to deal with these because of lack of resources and lack of studies related to it. This study is an attempt to portrait a picture of cardiovascular problems in Nepal on the basis of records obtained in various cardiac camps conducted by Shahid Gangalal National Heart Center in September 2008 to July 2011.

### Methods and materials

The reports of 19 cardiac camps were analyzed.

### Result

The proportion of congenital heart disease in cardiac camps ranges from 0.35% (Dolakha) to 5.04% (Dhangadi). The proportion of RHD ranges from 3.25% (Bhaktapur) to 30.67% (Dhangadi). The proportion of hypertension ranges from 5.11% (Dolakha) to 39.41% (Baglung). The proportion of CAD ranges from 0.56% (Tikapur) to 15.12% (Birgunj).

### Conclusion

The proportion of CHD and RHD were found the highest in Dhangadi. The lowest proportion of hypertension was found in Dolakha, the study was conducted in Singati, which is the most remote area among the areas included in this study. The highest proportion of hypertension was found in Baglung. The highest proportion of Coronary artery disease was found in Birgunj.

In every camp, the hypertension claims the major proportion of cardiovascular problem. It reflects, Nepal is in a rising epidemic of coronary artery disease. Preventive programs should be emphasized sooner as possible to prevent catastrophic effect of Cardiovascular Disease in Nepal.

### Key worlds

Cardiac Camp, Cardiovascular disease, Congenital heart disease, Rheumatic Heart Disease, Hypertension, Coronary Artery Disease, Development Regions

**Introduction**

Cardiovascular Disease is the number one killer in the world responsible for 17.3million death per year<sup>1</sup>. Once it thought to be the problem of developed countries however today it is a global health problem adding extra burden in developing countries like Nepal. Congenital Heart diseases, Rheumatic Heart diseases, Hypertension and Coronary artery diseases are common cardiac problems in Nepal. According to current scenario of heart diseases in Nepal on the basis of available studies, the prevalence of Rheumatic Heart disease and Congenital Heart Disease are 1.2 per 1000 and 1.3 per 1000 in school children<sup>3</sup>. The prevalence of hypertension is 19.7% in suburban adult population and coronary heart disease is estimated to be 5 percent in adult population in Kathmandu according to hospital data<sup>2,4</sup>. There is geographic variation in the prevalence of diseases. In general Rheumatic disease is more prevalent in rural areas and Hypertension and coronary artery diseases are more prevalent in urban areas.

There is a lack of research and studies in heart diseases in Nepal. In addition, community based studies are rare. This study is conducted as an attempt to fill this gap. It is a descriptive retrospective study. Secondary Data are obtained from Shahid Gangalal National Heart Centre(SGNHC) records of Cardiac Camps conducted from September 2008 to July 2011. Since 2008, every year SGNHC is conducting cardiac camps in various parts of Nepal, viz rural and urban covering atleast all development regions of Nepal. Data are taken from Department of Cardiac Rehabilitation and Health Promotion, a department responsible for prevention and rehabilitation of heart diseases.

**Methods**



This is a retrospective study and descriptive in nature. All the data from September 2008 to July 2011 are taken from department of cardiac rehabilitation and health promotion. There were total 24 cardiac camps conducted in that period but 19 camp reports were reviewed among them. Some cardiac camp reports were excluded because of poor reporting of diseases. They are secondary data primarily

collected in cardiac camps conducted in various parts of Nepal . The secondary data are analysed from Doctor's Forms used in cardiac camps, where doctors recorded their provisional diagnosis of a patient. Initially 19 cardiac camp areas were taken and they were classified in to five development regions. The heart disease is classified into congenital heart disease (CHD), rheumatic heart disease (RHD), coronary artery disease (CAD), and hypertension (HTN).

**Results**

**Eastern Region**

Name of the Area	Total Participants	CHD (%)	RHD(%)	HTN(%)	CAD(%)
Sanishchare	501	3.8	7.6	16.6	1.3

In Sanishchare, majority of participants were hypertensive (16.6%) followed by RHD 7.6%,CHD 3.8 % and CAD 1.3%.

**Central Region**

Name of the Area	Total Participants	CHD (%)	RHD(%)	HTN(%)	CAD(%)
Bhaktapur	503	3.25	3.25	30.56	1.38
Birgunj	324	1.54	8.33	27.78	15.12
Bungamati	129	*	*	18.64	*
Dhading	514	0.78	5.45	17.70	2.72
Dolakha	498	0.35	3.35	5.11	0.71
Pharpping	224	2.68	4.01	13.84	2.68
Sindhupalchowk	319	1.88	2.51	7.52	1.25
Sindhuli	443	2.93	8.58	17.61	2.03

\* particular disease not found.

There were total eight areas had covered. Hypertension seems to be a ruling disease among the participants from all the areas. The highest proportion was found in Bhaktapur (30.56%), followed by Birgunj (27.78%), Bungamati (18.64) and so on. The least proportion was found in Dolakha (5.11%) and Sindhupalchowk (7.52%). In Dolakha , the camp was conducted in a remote hilly region known as Singati whereas in Bhaktapur and Birgunj , it was conducted in urban areas. Likewise, the proportion of coronary artery disease (CAD) found to be the highest in Birgunj. It is also the highest among all the areas included in this study. In addition, the highest proportion of RHD was found in Sindhuli (8.58).

**Western Region**

Name of the Area	Total Participants	CHD (%)	RHD(%)	HTN(%)	CAD(%)
Arghakhanchi	620	0.8	9.03	12.74	0.96
Baglung	350	0.99	4.43	39.41	3.45
Beni	600	4.51	5.42	14	2.26

In this region three areas were taken. The proportion of CHD ranges from 0.8 % to 4.51%. RHD ranges from 5.42% to 9.03%. The highest proportion of HTN was found in Baglung(39.41%) which is the highest among all the study areas included in this study. The CAD ranges from 0.96% to 3.45%. In Baglung, the proportion of CAD seems to be lesser in compare to the proportion of hypertension.

#### Mid -Western Region

Name of the Area	Total Participants	CHD (%)	RHD(%)	HTN(%)	CAD(%)
Dang	503	1.79	7.16	15.90	1.19
Dailekh	462	0.85	5.41	13.20	0.65
Tikapur	354	1.69	3.39	18.08	0.56

In Mid-Western Region, there were three areas taken. The proportion of CHD ranges from 0.85% to 1.79%. The proportion of RHD ranges from 3.39% to 7.16%. The proportion of hypertension ranges from 13.20% to 18.08%. Likewise, the proportion of CAD was 0.56% to 1.19%. The proportion of CAD in Tikapur seems to be the lowest among all the study areas including in this study.

#### Far- Western Region

Name of the Area	Total Participants	CHD (%)	RHD(%)	HTN(%)	CAD(%)
Baitadi	201	1.70	6.25	11.95	2.85
Dadeldhura	212	2.83	15.57	8.02	3.30
Dhangadi	270	5.04	30.67	11.35	6.30
Mahendranagar	268	0.75	10.45	26.85	3.73

There were four major areas taken from Far Western region. Baitadi is the most remote area followed by Dadeldhura. Dhangadi and Mahendranagar could be considered as relatively urban area in this region. Correlating with this geographical character, the proportion of hypertension was found to be the highest in Mahendranagar (26.85). The highest proportion of RHD(30.67%) and CHD(5.04%) were found in Dhangadi.

## Discussion

The one of the most important non communicable disease , the heart disease is increasing in developing countries as well. In this study, the proportion of congenital heart disease in cardiac camps is ranges from 0.35% (Dolakha) to 5.04% (Dhangadi). The proportion of RHD ranges from 3.25% (Bhaktapur) to 30.67% (Dhangadi). The proportion of hypertension ranges from 5.11% (Dolakha) to 39.41% (Baglung). The proportion of CAD ranges from 0.56% (Tikapur) to 15.12% (Birgunj).

The proportion of CHD and RHD were found the highest in Dhangadi. Dhangadhi is a city in Far western [Nepal](#) bordering India. The city of Dhangadhi is one of the entry points into the country for people traveling from India. The

cardiac camp was conducted in the Seti Zonal Hospital. As it is a border area, we can assume that the catchment area of this region must be larger in compare to other study areas. It could be the reason of highest proportion of cardiac diseases.

The lowest proportion of hypertension was found in Dolakha, the study was conducted in Singati, which is the most remote area among the areas included in this study.

The proportion of different heart diseases found in this study is relevant to the previous studies related to heart disease conducted in Nepal.

## Conclusion

In conclusion with the support of these data, we can say that the heart disease is prevalent everywhere in Nepal. The prevalence is higher in urban areas than rural areas. The hypertension is increasing however the prevalence is lesser in remote areas. The huge proportion of hypertension in every camp suggests that Nepal is in daring need of preventive programs of heart disease to prevent the catastrophic effect of coronary artery disease in near future. Widespread preventive program should be implemented in Nepal to raise awareness among health care workers and general population.

## Study Limitation

This study gives a general picture of heart disease in Nepal however the data may not be statistically significant as they were collected in Cardiac Camps. The participants of the camps were randomly selected. The proportion of heart disease may vary according to its catchment area. Some reports of cardiac camps could not be included because of poor data recording.

## Acknowledgement

We would like to thank Dr Man Bahadur KC, Executive Director, SGNHC for permitting us to conduct this study. Our sincere thanks goes to the team leader, doctors and camp members of every cardiac camp. We would like to thank local partners and volunteers who helped to conduct cardiac camps . Finally, our heartfelt thanks goes to all the participants of the cardiac camps.

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# Angioplasty Outcomes in the Elderly Nepalese Patients: an eight years experience in Norvic International Hospital

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## ABSTRACT

### Background

The aim of the study is to evaluate and compare the outcomes of percutaneous transluminal coronary angioplasty (PTCA) between the elderly (>70 yrs) and the non-elderly (70 yrs and younger) Nepalese patients who had been admitted to Norvic International Hospital between early 2002 and April 2010.

### Methods

Data of a total of 92 elderly and 604 non-elderly patients were retrospectively analyzed after they had been admitted in the Hospital for the interventional treatment of acute coronary syndrome.

### Results

There were 64 (69.6%) male patients and 28 (30.4%) female patients in the elderly group. Elderly population had lesser smokers. Diabetic population was similar in both the age groups. The elderly patients slightly less success rate compared to the non-elderly (95.7% vs. 99.3%). There was no significant difference in bleeding complication and groin haematoma. In hospital death was 3.33% in elderly and 0.5% in non elderly.

### Conclusion

Though the outcome in the elderly is poorer in comparison to the younger patients, it is an expected result when compared to even the biggest centres worldwide.

### Introduction

Ischemic heart disease is one of the leading causes of death in any part of the world regardless of whether it's a developed country or a developing country like Nepal. Among all groups of people, the elderly especially have been undertreated with aggressive interventional procedures due to the fear of unfavourable events and of beliefs that it is less beneficial to the elderly, especially since it is known that cardiovascular morbidity and mortality rate rises up with age.

Percutaneous Transluminal Coronary Angioplasty (PTCA) which was first developed in 1977 by Andreas Gruentzig in Switzerland was first introduced to Nepal in the year 2002 by Norvic International Hospital. Since then, it has been widely practiced in the hospital and has been gaining popularity due to the fact that there are fewer complications, risks and less invasive compared to other surgical procedures such as coronary artery bypass graft (CABG).

PTCA involves opening of the blocked artery with a stent which helps to keep it open. This technique is performed to dilate the area of arterial blockage with the help of a catheter with an inflatable balloon at its tip. Prior to performing a PTCA the exact location and type of the blockage have to be determined which is done by a pre-procedure Coronary Angiography (CAG).

Norvic has been providing coronary interventional services to all patients of all ages. The aim of this study was to assess the outcomes of PTCA in the elderly Nepalese patients and to compare the outcome with the studies from other international centres.

### Methods

Norvic International Hospital has been a pioneer hospital in the field of cardiology in Nepal with procedures such as cardiac catheterizations and angioplasties done routinely. For this study, a total of 696 consecutive patients who were admitted in the Norvic Hospital for the interventional treatment of acute coronary syndromes between 2002 and April 2010 were analyzed. Data was retrieved from the cathlab database.

The participants were classified according to their age into Elderly (Over 70 years) and Non-elderly (70 years and below). Presence of risk factors such as hypertension, diabetes and dyslipidemia was noted.

Outcome of the procedure was considered successful if a normal antegrade flow was noted after the procedure. Major complications included in-hospital death, sub/acute thrombosis, life-threatening arrhythmia (VT/VF) and minor complications included gastro-intestinal bleeding and groin hematoma formation, and need for blood transfusion.

### Results

A total of 696 patients had undergone PTCA between early 2002 and April 2010. There were 92 elderly (>70 years) patients while the remaining 604 were aged 70 years or younger. The risk factors profile of the elderly (Table 1) show they were less likely to be smokers, diabetic, dyslipidemic or with a positive family history. But they were more likely to be hypertensive. The proportion of females was considerably higher in the elderly group.

**Table 1: Risk Factors in the elderly (>70 years) and Non-elderly (70 years and younger) patients**

	Elderly		Non-Elderly		Odds ratio (95% CI)	p-value
	N	%	N	%		
<b>Sex</b>						
Male	64	69.6%	506	83.8%	0.4(0.3-0.7)	0.001
Female	28	30.4%	98	16.2%		
<b>Smoking</b>						
Yes	15	16.3%	216	35.8%	0.3(0.2-0.6)	<0.001
No	77	83.7%	388	64.2%		
<b>Hypertension</b>						
Yes	70	76.1%	390	64.6%	1.7(1.0-2.9)	0.030
No	22	23.9%	214	35.4%		
<b>Diabetes</b>						
Yes	31	33.7%	226	37.4%	0.8(0.5-1.3)	0.491
No	61	66.3%	378	62.6%		
<b>Dyslipidemia</b>						
Yes	22	23.9%	205	33.9%	0.6(0.4-1.0)	0.056
No	70	76.1%	399	66.1%		
<b>Family History</b>						
Yes	3	3.3%	59	9.8%	0.3(0.01-1.0)	0.041
No	89	96.7%	545	90.2%		
<b>Total</b>	<b>92</b>	<b>100.0%</b>	<b>604</b>	<b>100.0%</b>		

Table 2 gives the outcomes and complications after the angioplasty procedure. The elderly patients slightly less success rate compared to the non-elderly (95.7% vs. 99.3%). There were an equal number of in-hospital deaths (3 each) but proportionately, there were more deaths in the elderly group. Comparatively, minor complications were present more in the non-elderly group.

**Table 2: Outcome and complications in the elderly (>70 years) and non-elderly (70 years or younger patients)**

	Elderly		Non-Elderly		Odds ratio (95% CI)	p-value
	N	%	N	%		
<b>Outcomes</b>						
Successful	88	95.7%	600	99.3%	0.2(0.1-0.6)	0.013
Unsuccessful	4	4.3%	4	0.7%		
<b>In-hospital death</b>						
Yes	3	3.3%	3	0.5%	6.7(1.3-33.9)	0.033
No	89	96.7%	601	99.5%		
<b>Sub/Acute Thrombosis</b>						
Yes	0	0.0%	3	0.5%	-	1.000
No	92	100.0%	601	99.5%		
<b>VT/VF</b>						
Yes	1	1.1%	1	0.2%	6.6(0.4-106.8)	0.247
No	91	98.9%	603	99.8%		
<b>Blood Transfusion</b>						
Yes	0	0.0%	2	0.3%	-	1.000
No	92	100.0%	602	99.7%		
<b>GI Bleeding</b>						
Yes	0	0.0%	1	0.2%	-	1.000
No	92	100.0%	603	99.8%		
<b>Groin Hematoma</b>						
Yes	0	0.0%	1	0.2%	-	1.000
No	92	100.0%	603	99.8%		
<b>Total</b>	<b>92</b>	<b>100.0%</b>	<b>604</b>	<b>100.0%</b>		

## Discussion

The choice for finest treatment for coronary artery disease in the elderly have always been a difficult task given that the elderly patients had more risk factors and also faced more side effects of the drugs due to differences in its absorption, metabolism, distribution and excretion.

The outcomes of PTCA in the elderly group had a high success rate (96%). But there were some cases of in-hospital death caused by the complications after the procedure. The causes of death in the elderly were not directly related to PTCA/Stenting but rather due to the complications of the risk factors and other co-morbidities.

Studies from other centres have also reported a similar trend. For example, a Polish study published in 2007 reported a high rate of success in elderly who had undergone PTCA but there were still unfavourable procedural outcomes and in-hospital deaths.

Earlier on, in the early 1980's PTCA had been hailed as a very good alternate to CABG in the elderly patients and had similar outcomes when compared to the younger patients<sup>2,3</sup>. However, later on, there were reports of problems associated with revascularization in the elderly. For example, Salley and colleagues mentioned in their 1993 article that 'the management of ischemic heart disease in the elderly is complex' and that 'invasive therapies such as percutaneous transluminal coronary angioplasty (PTCA) and coronary artery bypass grafting (CABG) are associated with significant morbidity and mortality'<sup>1</sup>. That more cautious approached was required in the elderly and that not all lesions would be suitable for stenting was remarked by Kowalchuk and colleagues in 1990 when they reported that only 31% of the lesions were amenable to stentin<sup>4</sup>. But at the turn of the millennium, reports of a positive short term and long term results, comparable to those of the younger patients, started pouring in- credited mostly to the advent of drug-eluting stents and increasing use of IIb/IIIa antagonists<sup>5</sup>.

## Conclusion

Though the outcome in the elderly is poorer in comparison to the younger patients, it is an expected result when compared to even the biggest centres worldwide. However, the study does point out the need to be extra vigilant when procedures such as angioplasty are performed in the elderly patients.

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## Cash Reports

Presented in International Conference (16-17 October 2011)



# Acute ST segment elevation MI with Normal Coronaries

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## Abstract

A 45 year-old man with no history of cardiac disease presented to the emergency department with typical angina chest pain of >24 hours duration. He was not thrombolized due to late presentation. Having elevated troponin and CK-MB levels and an electrocardiogram demonstrating anterolateral ST segment elevation and persistent of angina pain prompted coronary angiography which could be done only after 3 weeks of symptom onset due to financial constraint; which revealed coronary vessels free of significant disease. An echocardiogram showed dilatation of all cardiac chambers with hypokinesia of anterior wall and mid-septum and akinesia of apex. There was moderate mitral regurgitation and moderate tricuspid regurgitation and moderate systolic dysfunction.

A number of conditions can lead to ST segment elevation MI with normal epicardial coronary anatomy. We report a case possibly due to autothrombolysis. Treatment to such cases would be symptomatic drug therapy with reassurance and risk factor reduction.

### Case

A 45 years old man, a bus driver of a public vehicle, was seen in the emergency department of Manmohan Cardiovascular Thoracic and Transplant Centre (MCVTC), Maharajgunj, Kathmandu with the complaint of substernal chest pain.

The patient had been well until one day before the presentation, while he was staying at home in at around 10:00 am, pain in the substernal area developed suddenly. The pain was radiating to the both of his limbs. He vomited 4 times and felt nauseated. Since the same duration he felt shortness of breath on minimal exertion like walking to the bathroom.

He felt that the symptoms are due to minor illness and remained at home. He continued to feel uneasiness that day. He had orthopnea and needed extra pillows to get rid of dyspnea. He presented next day to ER, where he was evaluated. On examination, he was tachycardic with pulse rate of 100 beats per minute and his Blood Pressure was 100/80 mm of Hg right arm in supine position. He had S3 gallop and bibasal crackles on auscultation. Rests of the clinical examination were normal.

An electrocardiogram (ECG) showed a normal sinus rhythm, with rate of 136 beats per minute, and ST-segment elevation of up to 0.3 mV in leads V1 through V6, I, and aVL, and QS pattern in V1 through V6. Oxygen, acetylsalicylic acid, clopidrogel, intravenous frusemide were administered. Enalapril and subcutaneous enoxaparine were also given. Patient was not thrombolysed due to late presentation (>24 hours). Patient was getting much relief after treatment and got admitted in CCU.

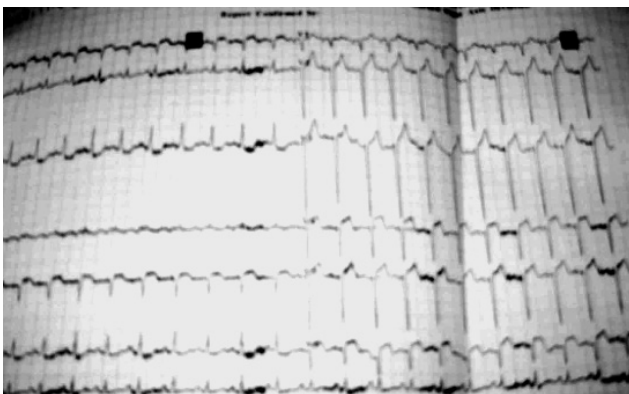


Figure 1. ECG at time of presentation to ER

He was not hypertensive and not a diabetic. He had no previous symptoms suggesting coronary artery disease, peripheral vascular artery or cerebrovascular disease. He was taking no medications and had no allergies. He was teetotaler and non smoker. The family history was non contributory.

The testing for Troponin I was positive by rapid antigen test, CK-MB level was 330 U/l, Hemoglobin was 18.1 gm/dL, total white cell count 19,500/cmm with 90% neutrophils. Serum electrolytes, plasma glucose level and urine routine examination were normal.

CK-MB reduced to 235 U/L on 2<sup>nd</sup> day of onset of symptoms and reduced to 54 U/L on 3<sup>rd</sup> day. Lipid profile showed total cholesterol of 3.7 mmol/L, LDL-cholesterol 2.2 mmol/L, HDL- cholesterol 1.1 mmol/L and triglyceride 0.7 mmol/L. Serum urea and electrolytes remained normal throughout the hospital stay. White cell count normalized on 10<sup>th</sup> day.

During the stay he developed hospital acquired pneumonia and recurrent angina. The patient got better with intravenous Cefepime and Amikacin and as required Glyceryl Trinitrate sublingual spray. Fundoscopy revealed normal examination.

Echocardiography showed dilatation of all cardiac chambers with hypokinesia of anterior wall and mid-septum and akinesia of apex. There was moderate mitral regurgitation and moderate tricuspid regurgitation. Right ventricular systolic pressure was calculated to be 65 mm Hg. Left ventricular ejection fraction was 44%. There was no mass, thrombus or pericardial effusion.

Subsequent ECG showed gradual resolution of ST-segment, and QS pattern was persisting in V1 through V6. Later ECG showed T-wave inversion in lateral leads.

Patient was managed conservatively and was improving slowly and gradually. He was gradually mobilized and discharged after 23<sup>rd</sup> days hospital stay. He was advised to take Acetylsalicylic Acid, clopidrogrel, atorvastatin, metoprolol succinate, enalapril and nitrate. He was referred to Shahid Gangalal National Heart Centre for coronary angiography. The coronary angiography was done on 3<sup>rd</sup> week of onset of symptoms. The report showed completely normal epicardial coronary arteries.

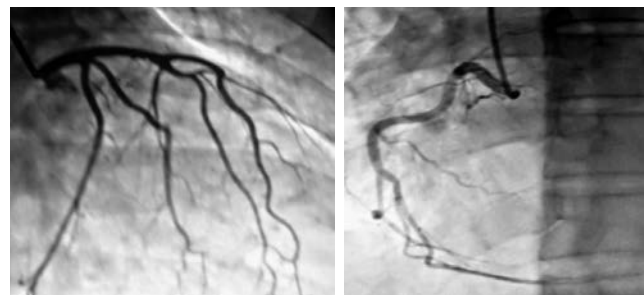


Figure 2. Angiogram report

### Discussion

What could be the possibility of normal coronary arteries? Approximately 4- 7% of all patients with acute myocardial infarction and nearly four times this percentage of patients younger than age 35 years do not have atherosclerotic



coronary artery disease as demonstrated by coronary angiography or at necropsy or both [1-3]. Coronary angiography simply represents an image of the lumen, so the specificity for etiology of the coronary artery disease is extremely low. Review of necropsy studies shows that approximately 95% of patients with fatal acute myocardial infarction have at least one major epicardial coronary artery with severe luminal narrowing or total occlusion. The remaining 5% of these patients have normal major epicardial coronary artery.

Of the 95% of the patients with severe coronary artery luminal narrowing, 95% have typical atherosclerotic plaque with a superimposed thrombus in 85%. The remaining 5% of patients with severe coronary luminal narrowing have a host of etiology, including coronary arteritis, trauma, systemic metabolic disorders (mucopolysaccharidosis, amyloidosis, Fabry's disease, homocystinuria), intimal fibrous proliferation, and coronary emboli.

Of the 5% of patients seen at necropsy after acute myocardial infarction with normal epicardial coronary arteries, 50- 60% likely represent clinical coronary spasm, but the remaining 40- 50% represent a combination of congenital coronary artery anomalies, spontaneous recanalization, and mismatches of coronary supply and myocardial demand.

There are relatively few necropsy reports of patients with acute myocardial infarction who had angiographically normal coronary arteries and normal coronary arteries at necropsy [4, 5]. But these do occur. The possible explanations for these include coronary artery spasm, coronary artery disease in vessels too much small to be visualized angiographically and coronary artery thrombus or emboli with subsequent clot lysis.

The possibility in our presented case could be coronary artery thrombosis and spontaneous clot lysis and recanalization a condition termed as cardiac syndrome X. Though, we have not excluded coronary artery spasm by inducing with ergonovine provocation test [6]. The chest pain is usually indistinguishable with traditional angina caused by obstructive coronary disease and is, therefore, considered a diagnosis of exclusion. When intravascular ultrasonography (IVUS) studies have been performed in these patients a spectrum of finding ranging from normal vessels to intimal thickening to nonobstructive atheromatous plaque has been reported [7].

The Possible mechanisms for the absence of significant coronary disease include rapid clot lysis, coronary vasospasm (variant angina), cocaine use, inherited thrombophilia, and coronary microvascular disease. In favor of the last mechanism is the observation in a report from the TIMI IIIA trial that approximately one-third of

these patients had abnormally slow angiographic filling (TIMI flow grade 2 or less) [8].

The exact basis for the signs and symptoms of this condition has not been elucidated. Some general statements can be made, however, regarding the clinical profile of these patients. Syndrome X has an increased occurrence in women (3:1 preponderance), both pre- and post-menopausal [9]. Endothelial dysfunction, microvascular ischemia, and abnormal pain perception have all been implicated for the etiology of the disorder. Endothelial dysfunction as demonstrated by abnormal coronary flow reserve (CFR), single photon emission computed tomography stress and positron emission tomography stress testing is common in these patients. In addition, behavioral and psychiatric conditions often exist.

Another possibility could be Takotsubo syndrome, also known as LV ballooning syndrome or stress induced cardiomyopathy. It presents with sudden onset chest pain, ECG changes with ST elevation, mimicking acute myocardial infarction, usually in the setting of severe emotional distress and catecholamine surge. The angiogram shows normal coronary artery and diagnosis is made on the typical appearance by LV ventriculogram or echocardiogram with basal hyperkinesis and severe apical systolic wall motion abnormality [10]. Most patients recover LV function and require only hemodynamic and pharmacological support.

Thus sometimes we consider the coronary artery disease to be the causative factor for acute myocardial infarction and coronary angiography comes to be completely normal as our case. In such a situation, the treatment consists of symptomatic treatment with drugs, reassurance and aggressive reduction of risk factors. In developing countries like Nepal for logistic and economic reason invasive therapy is still a challenge, yet when done may come normal. This may bring tremendous stress to the patient and bewildering to the physician. More investigation and development of strategy to diagnose and treat these disorders in the future will be helpful.

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# Is he the culprit?

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## ABSTRACT

The peripartum cardiomyopathy (PPCM) generally occurs in the last trimester of pregnancy or within 6 months of delivery. The disease generally occurs in multiparous female more than 30 years of age. The prognosis depends upon whether the heart returns to normal size after the first episode of CHF. If heart remains enlarged or the ejection fraction remains depressed after 6 months, the prognosis is poor<sup>1</sup>.

We present a case of 27 years female who gave birth to her fourth child and presented peripartum cardiomyopathy 11 months after the child birth. She was admitted, evaluated and managed with diuretics in the initial period and when stabilized placed on ACE inhibitor and alpha beta blocker. She improved significantly and was discharged. She was on regular follow up and showed a significant improvement in heart size, ejection fraction and valvular function when re-evaluated after 7 months.

### Key words

Peripartum cardiomyopathy, echocardiography, congestive cardiac failure

**Introduction**

Peripartum cardiomyopathy (PPCM) is an idiopathic cardiomyopathy that presents with heart failure secondary to left ventricular systolic dysfunction toward the end of pregnancy or in the months after delivery, in the absence of any other cause of heart failure. PPCM is a diagnosis of exclusion. Although the left ventricle may not be dilated, the ejection fraction is nearly always reduced below 45%. This is the definition adopted by Heart Failure Association of the European Society of Cardiology Working Group on PPCM 2010<sup>3</sup>. Multiparity, black race, elderly gravida and gestational hypertension are noted risk factor but the exact cause is unknown though nutritional, viral , genetic and immune mechanism has been hypothesized contributing to PPCM<sup>4</sup>. The incidence of PPCM has a wide variation among countries ranging from 1 per 1000 live birth to 1 per 6000 live birth<sup>4</sup>.

**Case Report**

Here we are reporting a case of 27 years multiparous, female (P<sub>4+3</sub>) from Rautahat district who had given birth to a live baby 11 months back, normal vaginal delivery at home, presented to emergency department with complains of easy fatigability for last 7 days. She also complained of palpitation and gradually worsening shortness of breath since then. Initially she had shortness of breath on extreme exertion but from last 2 days she got breathless even with minimal exertion. She said her symptoms worsen when she lie down than when she sat upright. However there was no history of fever, cough and chestpain. She was nondiabetic, nonhypertensive. She never smoke or drank alcohol. There was no past history of any heart disease and she never had such symptoms on her previous pregnancies and child birth. On examination, she was a bit restless with tachycardia, pulse rate 130 per minute and tachypnea with respiratory rate 28 per minute. Her blood pressure was 100 mmhg systolic and 60mmhg diastolic. She was not febrile. There was no icterus, no pallor and no pedal edema. On auscultation she had pulmonary rales and basal crepitations spreading upto half of lower chest bilateral. Cardiac auscultation revealed a systolic murmur over the mitral area. She was advised for a Chest X-ray, ECG and Echocardiography. Chest X ray PA view was typical of pulmonary edema with scattered patchy opacities on lower zone and cardiomegaly. The ECG showed sinus tachycardia, first degree AV block and nonspecific ST and T segment changes. Echo revealed marked LV systolic dysfunction, EF 25-30 %, moderate MR and LVID 61.7mm diastole . A provisional diagnosis of congestive cardiac failure was made. The patient was admitted and managed with fluid and salt restriction, diuretics, antibiotics and proton pump

inhibitors. She gradually showed improvement. The ace inhibitor was added on 3rd day admission along with alpha beta blocker. The dose of alpha beta blocker was titrated. She was discharged on fifth day with diuretics, a combination of spironolactone 50mg and furosemide 40 mg half tablet at 8am once daily, enalapril 2.5mg once a day and carvedilol 3.125mg twice daily and was advised to follow up in 2 week. Her hospital stay was uneventful and at the time of discharge her blood pressure was 110/70 mm hg, pulse 90 per minute, respiratory rate 20 per minute and temperature 98°f. The chest was clear on auscultation but the systolic murmur still audible at mitral area. She paid regular visit to the OPD. An echocardiography repeated at 7 month showed a significant improvement in ejection fraction 40-45%, MR was also reduced and LVID improved 57.9mm diastole.



FIG 1 chest xray at the time of admission



Fig 2 Chest Xray after 6 months

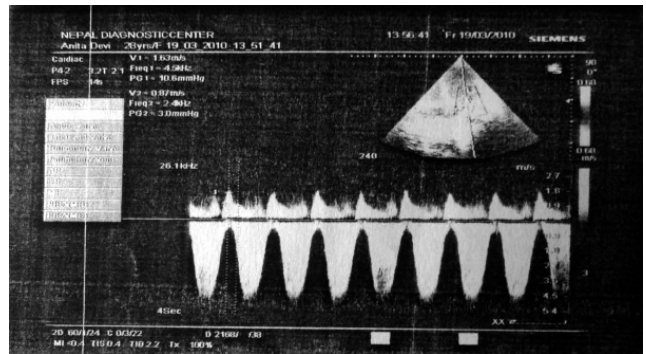


FIG 3. Echocardiography at the time of admission

**Discussion**

The first case of PPCM was reported in 1800s<sup>4</sup>. The entity is associated with every 1000 to 6000 pregnancy in the world<sup>4</sup>. There have been no studies about its incidence in Nepal. The diagnostic criteria includes 1) development of cardiac failure in last month of pregnancy, 2) absence of any identifiable cause for heart failure 3) absence of recognizable heart disease before last month of pregnancy and 4) left ventricular dysfunction (EF less than 45%). The etiology is not clear. The nutritional factor especially deficiency of selenium, viral myocarditis, genetic factors and immune mechanism has been implicated. Risk factor includes multiparity, black race, older maternal age and

gestational hypertension<sup>3</sup>. The disease presents with sign and symptoms of congestive cardiac failure which overlap with many other condition ranging from normal pregnancy to pulmonary emboli and upper respiratory tract infection. Laboratory investigations including cardiac enzymes and pre-eclampsia work up should be considered but there are no specific laboratory abnormalities. Imaging studies include chest radiography, electrocardiogram and two dimensional echocardiography. ECG may show sinus tachycardia, nonspecific ST and T wave abnormalities and voltage abnormalities. Patchy infiltrates in the lower lung fields, with vascular redistribution/cephalization, cardiomegaly and pleural effusions indicate congestive heart failure and may be seen in chest radiography. Echocardiography should be performed in all women in whom the diagnosis of PPCM is considered in order to assess ventricular function, valve structure, chamber size, and wall motion. The treatment is similar to other forms of CCF i.e. fluid and salt restriction, diuretics and beta blockers. The ACE inhibitors are contraindicated in pregnancy and the use of digoxin, nitrate and hydralazine should be considered. PPCM is associated with a high rate of thromboembolic complications. Cases of arterial or venous thrombosis have been reported in as many as 50% of women with PPCM. Because pregnancy is a hypercoagulable state, once the diagnosis of PPCM is established, prophylactic anticoagulation should be considered during pregnancy<sup>3</sup>. The delivery of the baby should be planned with a consultant gynecologist. Prognosis seems dependent on recovery of left ventricular function. 30% percent of patients return to baseline ventricular function within 6 months, and 50% of patients have significant improvement in symptoms and ventricular function. Mortality is directly related to recovery of ejection fraction ranging from 7 – 50 % half death occurring within 3 months of pregnancy. The usual causes of death are progressive, heart failure, arrhythmia, or thromboembolism. Women with persistently abnormal ejection fractions are at high risk of developing heart failure and worsening cardiac function if they become pregnant again. A patient has so much expectation out of her pregnancy and child birth and when such incidence comes along, they get so much helpless and depressed. So a physician should provide support to the patient and discuss all the issues with her and her family members. He should assure her that this was not due to anything that she do or didn't do. A physician should always keep this in mind while working out a dyspneic female patient around her pregnancy or child birth.

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# Abstracts

Presented in International Conference (16-17 October 2011)





# Enhanced External Counterpulsation(EECP): Shahid Ganga- lal National Heart Center experience in first nine patients.

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## Background

EECP is a novel; FDA approved; non-invasive; outpatient treatment offered to patients with refractory angina pectoris (RAP). It uses sequentially inflated pneumatic cuffs on the lower extremities to enhance coronary diastolic flow. We studied its effect in eight patients with refractory angina pectoris.

## Methods

All patients (n=9) who were referred for EECP to Shahid Gangalal National Heart Centre who completed a treatment course (one hour per day for 35 days) of EECP and underwent 6-minute walk test before and after treatment were included. Demographic data, coronary artery disease (CAD) risk factors and baseline angiographic data were collected. Distance covered in six minute walk test before and after the treatment was compared.

## Results

All the patients who had undergone EECP had a positive clinical response. Distance covered in Six minute walk test improved in all patients after the treatment. Decrease in anginal severity, frequency and the use of sublingual nitrates, with improvement in quality of life was observed after the treatment. During the treatment some patients complained of leg pain, one patient develops blister and one ecchymosis but the treatment was not discontinued.

## Conclusion

The results from these patients suggest that EECP is an effective, safe and well tolerated treatment option for the patients with RAP.

## Key Word

EECP, CAD, Angina Pectoris

# Predicting outcomes in patients of acute coronary syndrome using biochemical markers

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## Background

Acute coronary syndrome consists of acute myocardial infarction with or without ST segment elevation and unstable angina. Cardiac biomarkers provide a convenient and noninvasive means to gain insights into the underlying causes and consequences of ACS that mediate the risk of recurrent events and may be targets for specific treatment. The role of high sensitivity C reactive protein (HS CRP) for predicting the outcome has been established in patients of acute coronary syndrome. There are studies to show the prognostic importance of estimated glomerular filtration rate. But our population differs genetically and environmentally as compared to west.

## Objectives

To assess risk prediction in patients with acute coronary syndrome during the hospital stay, at 6 weeks and at 6 months period using high sensitivity C reactive protein, serum creatinine, cardiac Troponin I, creatine Kinase Total and MB levels.

## Materials and methods

It was a Prospective observational study. The Primary Outcome was taken as all cause mortality. All the consecutive patients with the diagnosis of acute coronary syndrome and giving informed consent for the study were enrolled and followed up at 6 weeks and 6 months duration from the index event. Mortality and the likely cause of death were recorded along with the day since admission. The highly sensitive C - reactive protein was estimated on admission, at 6 weeks and at 6 months. The estimated glomerular filtration rate (eGFR) was calculated using the abbreviated modification of diet in renal disease (MDRD) formula at admission, at 6 weeks and 6 months. For estimating cardiac troponin I (cTnI) qualitative membrane based immunoassay was used. The levels of creatine kinase total and MB was measured on admission.

## Results

There were total of 108 cases of acute coronary syndrome in duration of 6 months who completed the follow up. The study showed 44% of patients had STEMI; 41% had NSTEMI and 23% had UA. The HS-CRP level of > 5mg/dl was highly significant for predicting mortality during hospital stay and at 6 weeks ( $p < 0.001$ ). There was 11% of in hospital mortality ( $p < 0.001$ ). At 6 months the overall mortality was 28% ( $p < 0.001$ ). Arrhythmias were observed in 27% patients ( $p < 0.001$ ). Cardiogenic shock complicating STEMI resulted in high patient mortality ( $p < 0.001$ ). There was a statistical significance with low eGFR (median eGFR 45ml/min/1.73m<sup>2</sup>) levels during the admission. Illiteracy, Smoking more than 10 pack years and diabetes mellitus of duration more than 10 years was associated with increased risk of mortality.

## Conclusion

High sensitivity C reactive protein levels above 5mg/dl and the eGFR levels  $\leq 30$ ml/min/1.73m<sup>2</sup> was significant in predicting mortality of the patients with ACS. Age above 75 years, albuminuria detected using uristix and cardiogenic shock were also significant in predicting mortality in patients of ACS. The role of HS CRP in the primary prevention of cardiovascular adverse events needs to be widely explored.

# Invasive cardiology in Eastern Nepal: An initial experience

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## Introduction

The burden of ischemic heart disease (IHD) in developing countries is on the rise, due to urbanization, industrialisation and the low availability of evidence based therapies and interventions. The BPKIHS cardiac catheterization laboratory became functional since January 2011 and interventional procedures have been routinely performed since then.

## Methods

A registry is being maintained for all consecutive procedures being performed in the cardiac catheterization laboratory and we sought to determine the profile of invasive procedures performed during the first 8 months of activity.

## Results

A total of 141 procedures have been performed of which 114 were coronary angiographies, 33 coronary angioplasties, eighteen renal angiographies, five permanent pacemaker implantation, one renal angioplasty, three balloon mitral valvotomy, 14 temporary pacemaker insertion and eight pericardiocentesis. Normal coronaries were detected in 36 patients (36%), and 78 patients had significant CAD; of those, six (7%) were referred for a coronary bypass surgery, 39 (50%) were treated medically, and 33 were treated with angioplasty (43%). Sixteen (48%) were primary percutaneous coronary intervention (PPCI) for acute coronary syndrome. Left anterior descending artery (LAD) angioplasty was performed in 14 patients, left circumflex artery (LCx) angioplasty in 8 and right coronary artery (RCA) angioplasty in 11 patients. A total of 35 stents were used of which 17 (49%) were bare metal stents and 18 (51%) drug eluting stents. The mean contrast use during angioplasty was 140 ml and for angiography was 80 ml. The mean fluoroscopic time required for angioplasty was 18.6 minutes and for angiography was 7.2 minutes.

## Conclusions

During the first 8 months of our invasive activity, the most commonly performed procedure was diagnostic coronary angiography (81% of all procedures). This was followed by revascularisation in 27% patients, 23% by PCI on-site, 4% by surgery after referral to Sahid Gangalal Heart Centre, Kathmandu. Our success rate was high and our complication rate was acceptably low. We expect the volume of procedures to continue increasing, and believe that our activity is a significant contribution to the improvement of cardiac care in Eastern Nepal.

## Correspondence

Dr. Nikesh Raj Shrestha, Associate Professor, Cardiology Division, Dept. Of Internal Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal. 9852045083, nikesmd@gmail.com

# A Diabetic Clinic Experience from Eastern Nepal: Obesity and Cardiovascular disease assessment in diabetes patients

Maskey R

BP Koirala Institute of Health Sciences, Dharan, Nepal

## Background

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in type 2 diabetes mellitus (DM). DM is a risk equivalent for coronary heart disease (CHD).

## Objective of study

The aim of this study was to assess body mass index and cardiovascular risk assessment in diabetic patients.

## Materials and method

This was a hospital based cross sectional comparison study conducted among the 200 consecutive diabetic out-patients from January 2010 to December 2010. Among the consenting diabetic patients of age above 14 years, cardiovascular disease risk screening done by ECG and Echocardiography. Type 2 diabetes was diagnosed based on WHO criteria and ADA guidelines 2009 respectively, and common diabetes related complications (macro-vascular and micro-vascular) were diagnosed clinically and with relevant investigations

## Results

Among 200 confirmed cases of DM (101 male and 99 female), 38.5% were of age group above 60 years. As recommended for Asians (BMI  $\geq 23$  kg/m<sup>2</sup>) for overweight, 28.5% were overweight, 18.5% obese and 50% morbid obese. The prevalence of CVD were 13.5% and significantly associated with age, duration of diabetes, hypertension, diabetic retinopathy, metabolic syndrome, renal insufficiency, triglycerides, high-density lipoprotein (HDL) cholesterol. The most common and frequent micro-vascular complications were retinopathy (32.0%), neuropathy (24.5%), nephropathy (8.5%) and others (21.5%). About one third had hypertension (stage 1 hypertension- 19% and stage 2 hypertension 11.5%).

## Conclusion

We found increasing age, duration of diabetes, hypertension, diabetic retinopathy, metabolic syndrome, renal insufficiency, raised triglycerides, decreased high-density lipoprotein (HDL) cholesterol and morbid obesity were significantly associated CVD risk factors among outpatients diabetic clinic in eastern Nepal. It was an interesting finding to see 50% of the patients being morbid obese when BMI for Asian Classification was used.

## Key Words

Diabetes Mellitus, Obesity, CAD risk factors, Outpatients clinic, BPKIHS

# ECMO following complex congenital cardiac surgery in children and neonates at SGNHC

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## Abstract

### Background

Cardiac extra-corporeal membrane oxygenation (ECMO) is used as a method for mechanical life support in the face of extreme cardiopulmonary failure after cardiac surgery. Application of ECMO following pediatric cardiac surgery varies between different institutions based on manpower availability and philosophy towards ECMO utilization. Neonatal and paediatric cardiac extra-corporeal support is a technically challenging therapy that is applied in cases of post-operative respiratory failure due to pulmonary oedema and low cardiac output syndrome. Shahid Gangalal National Heart Centre has been running ECMO programme since last 2 years.

### Objectives

To present our initial experience with ECMO support in patients with respiratory failure and low cardiac output syndromes following open-heart surgery for congenital cardiac anomalies.

### Methods

The charts of all pediatric and neonatal patients requiring ECMO support following cardiac surgery for complex congenital cardiac anomalies were retrospectively reviewed. Patient and ECMO characteristics were evaluated.

### Results

Between 2009 and 2011, eight neonates and children were treated at our institution by ECMO following open heart surgery. Two patients were weaned from ECMO.

### Conclusions

Following cardiac surgery for congenital cardiac anomalies, respiratory failure and low cardiac output, unresponsive to maximal conventional medical support, is a rare but life threatening condition. ECMO serves as a rescue mechanical support till the improvement of the function of lungs and heart for these patients and can serve as a bridge to recovery.

# Assessment of left ventricular mass regression in patients treated with various antihypertensive drugs.

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## Background

Left ventricular (LV) hypertrophy is a strong risk factor for cardiovascular complications and morbidity. Initial evidences suggest that whether LV mass index is reduced or progresses over time directly influences the risk of subsequent complications. Antihypertensive treatment can decrease the LV mass index; however various drugs differ in their ability to reduce it. This prospective study was designed to assess the effect of various antihypertensive drugs on LV mass index in hypertensive subjects.

## Method and Materials

A cohort of essential hypertensive subjects on medicine, either on angiotensin converting enzyme inhibitors (ACE-I) or angiotensin receptor blockers (ARB) and other antihypertensive drugs except calcium channel blockers (CCB) (Group A) or on CCB and or other antihypertensive drugs except ACE/ARB (Group B) with echo proven increased LV mass index was included in the study. Their LV mass index was measured after six or more months of regular follow up.

## Results

Out of 152 subjects 51(33%) met the inclusion criteria of increased LV mass index. Mean age was 55 years with male to female ratio 4:1. Mean follow up period was 10.5 months ranging from 6 to 15 months. Twenty three subjects were in group A and 23 were in group B. Mean LV mass indexes in group A and B were 127.61 and 136.14 g/m<sup>2</sup> at the time of enrollment and 117.45 and 147 g/m<sup>2</sup> at the time of follow up echo study with statistical significant regression in group A. The majority (72%) in group A had LV mass regression. In group B, only 38.5% subjects had reduction in LV mass.

## Conclusion

In this study subjects treated with ACE/ARB drugs had significant regression in mean LV mass index in comparison to those without it where a progression in it was observed.

## Key words

left ventricular mass index, regression, antihypertensive drugs

# Cardiac Electrophysiological Study and Radiofrequency Catheter Ablation; Our Experience at SGNHC

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## Abstract

Cardiac electrophysiological study radiofrequency ablation is a form of cardiac intervention for diagnosing and treating cardiac arrhythmias. Various catheters are placed in the various part of the heart to record signals and radiofrequency energy is used for the ablation.

A total of 768 patients with paroxysmal supraventricular arrhythmias underwent the procedure at Shahid Gangalal National Heart Centre in a period of October 2003 to September 2011.

The success rate is high (92%) and the complication rate is low (0.8%) which is comparable to the results shown in various literatures. This form of treatment is fairly safe and provides a definitive cure to the patients.

## Key words

EPS, RFA, Shahid Gangalal National Heart Centre, Nepal

## Experiences with PCI-1000 cases Jan 2002-May 2011 at Norvic International Hospital

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Norvic International Hospital, Kathmandu, Nepal

### **Objectives:**

The aim of this study was to evaluate the status of the initial one thousand coronary angioplasty cases in Norvic International Hospital and their subsequent follow ups between Jan 2002 and May 2011.

### **Methods and Results:**

Data of the one thousand percutaneous coronary intervention (PCI) patients were retrospectively analyzed after they had had been admitted in the hospital for PCI. Follow up was done at 3 months, 6 months, 1 year, 3 years and 5 years from the date of the procedure. 80.5% (805) patients were male while 19.5% (195) were female. 64.2 % were hypertensive, 46 % had dyslipidemia , 35.8 % were smokers and 33% of the patients were diabetic. There was a mortality of 0.26 % in elective cases , 1.98 % mortality in primary angioplasty cases and 8.86 % mortality in rescue angioplasty. Comparison with studies from other centres showed a similar trend worldwide.



# Lightening Induced Myocarditis

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Most often, myocarditis is results from common viral infections; less commonly, specific forms of myocarditis may result from other pathogens, toxic or hypersensitivity drug reactions, giant-cell myocarditis, or sarcoidosis. We report a rare form of myocarditis caused by lightning in a ten year old girl who was brought to us in frank pulmonary edema. She was struck by lightning while sitting outside her house. She had features of acute left ventricular failure at the time of presentation. Her heart rate was 150 per minute. She had hypotension and features of pulmonary congestion. Troponin and CPK MB were significantly raised. ECG showed Sinus tachycardia. Chest Xray revealed pulmonary edema with increased cardiac size. Echocardiography revealed significant LV systolic dysfunction (LVEF 30%) with minimal chamber enlargement. She was managed with intravenous infusion of dobutamine and nitroglycerine. She also received IV furosemide and other supportive treatment. She recovered from acute LVF within 72 hours. Her tachycardia was controlled by low dose metoprolol, which she tolerated well. Detailed echocardiography done later revealed thickened left ventricular wall with full recovery of its systolic function (LVEF 60%). Patient was discharged from hospital after 8 days of admission on low dose metoprolol.

## Key words

Myocarditis, Lightning, pulmonary edema.

## Pseudoaneurysm of Aorta: Long term sequelae of Major Trauma

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Bansbari, Kathmandu, Nepal

Victims of major trauma, who may have survived the initial incident might suffer from it's sequelae later on in life. We present two such patients. 67 yrs old gentleman fell from tree 28 yrs back and presented with pseudoaneurysm of ascending aorta, aorto-bronchial fistula and diaphragmatic hernia. Another patient, 60 yrs old male had fall 48 yrs back and presented with pseudoaneurysm of proximal descending aorta. Both patients underwent successful repair of their pseudoaneurysm with cardiopulmonary bypass. Post op course was uneventful.

# Nepalese Heart Journal

## Authors Guidelines

### Introduction

Nepalese Heart Journal (NHJ) is a peer-reviewed, open-access, Medical journal NHJ is an official journal of Cardiac Society of Nepal.

NHJ stands as a forum from which the researches conducted in various disciplines in Cardiovascular Medicine, the reviews done, novel and unique cases which we encounter during our professional career can be made available to our readers.

### Types of articles

In each issue, we publish articles under certain types/ sections. The types of articles we publish are as follows:

- Editorials
- Original Articles
- Audits
- Case Reports
- Review articles
- Medical education

Beside the regular types of articles we also sometimes publish articles under categories like Invited Articles (See below for details of each type), Proceedings/ Declaration of Conferences/ Congress, Updates, Supplements, etc. The types are determined by the title, aim(s) and objective(s), and most importantly the content of the manuscript. We also require that the author clearly specifies the type of article s/he is submitting. However, the final decision under which category the article is published rests on the decision of the editorial board. In such case, the author will be duly informed regarding the decision. The author will have the right to withdraw the article if s/he chooses, but must do so within the specified time.

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An "author" generally considered as someone who has made substantive intellectual contributions to a published study, and biomedical authorship continues to have important academic, social, and financial implications. An author must take responsibility for at least one component of the work, should be able to identify who is responsible for each other component, and should ideally be confident in their co-authors' ability and integrity.

NHJ will follow the ICJME recommendation with the following criteria for authorship;

Authors should meet conditions 1, 2, and 3.

1. Authorship credit should be based on
  - Substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
  - Drafting the article or revising it critically for important intellectual content; and
  - Final approval of the version to be published.
2. When a large, multicenter group has conducted the work, the group should identify the individuals who accept direct responsibility for the manuscript. These individuals should fully meet the criteria for authorship defined above, and editors will ask these individuals to complete journal-specific author and conflict-of-interest disclosure forms. When submitting a manuscript authored by a group, the corresponding author should clearly indicate the preferred citation and identify all individual authors as well as the group name. Journals generally list other members of the group in the Acknowledgments.
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5. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.

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### Authorship

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One author (a "guarantor") should take responsibility for the integrity of the work as a whole. This is the corresponding author, the one who sends in the manuscript and receives reviews, but

other authors can have this role. All authors should approve the final version of the manuscript.

It is preferable that all authors be familiar with all aspects of the work. However, modern research often done in teams with complementary expertise so that not every author may be equally familiar with all aspects of the work.

### Number of Authors

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All contributors who do not meet the criteria for authorship

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Groups of persons who have contributed materially to the paper but whose contributions do not justify authorship may be listed under such headings as “clinical investigators” or “participating investigators,” and their function or contribution should be described—for example, “served as scientific advisors,” “critically reviewed the study proposal,” “collected data,” or “provided and cared for study patients.” Because readers may infer their endorsement of the data and conclusions, these persons must give written permission to be acknowledged.

### Authorship criteria

To qualify for authorship, the author must have contributed substantially to the intellectual content of the manuscript.

- A
  - conception and design
  - acquisition of data
  - analysis and interpretation of data
- B
  - drafting of the manuscript
  - critical revision of the manuscript for important intellectual content
- C
  - statistical analysis
  - obtaining funding
  - supervision

### Manuscript processing

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## Paper Presentation and Format

NHJ has following outlines for paper presentation and formats.

1. Use double spacing throughout
2. Pages should have margins at least 25 mm and be numbered
3. Maintain the sequence title page, abstract, key words, text, acknowledgements, references and legends.
4. Text should be presented as per the nature of paper
5. The Cover page should carry the title, a short running title, total words count on abstract, total word count of manuscript, information of any disclaimers or funding bodies and the corresponding author's full names, qualifications, affiliations, departments, email and addresses of institute affiliated (street, city, country)
6. Authorship page should carry in sequence information on primary author, corresponding author, and other authors, with authors' full names, qualifications, affiliations, departments, email and addresses of institute affiliated (street, city, country)
7. Declaration page must be scanned and sent with signature of all authors.
8. Include permission to reproduce previously published material or to use illustrations that may identify participants

## Use of Language

1. Uniformity in Language is required, with preference to British English
2. There should be no abbreviation in Abstract
3. Abbreviation spelt out in full for the first time
4. Avoid repetition of same words and waste words
5. Do not use '&' and '@' in the text
6. Running title provided should be not more than 50 characters
7. Format the manuscript in a single column
8. Do not use any special typeface for emphasis

## Use of Numbers

1. Numbers less than 10 should be written in words.
2. Numbers 10 or more should be written in numbers.
3. Words not numbers begin a sentence.

4. Be consistent in lists of numbers.
5. Numbers less than 1 begin with a zero.
6. Do not use a space between a number and its percent sign.
7. Use one space between a number and its unit.
8. Report percentages to only one decimal place if the sample size is larger than 100.
9. Do not use decimal places if the sample size is less than 100. 10. Do not use percentages if the sample size is less than 20.
11. Do not imply greater precision than your measurement instrument.
12. For ranges use "to" but not "-" to avoid confusion with a minus sign and use the same number of decimal places as the summary statistic.
13. Rules for data numbers do not apply to citations to the literature
14. Us the metric system throughout; use of appropriate SI Units is encouraged. If using other, more commonly used units, give the SI equivalent in parenthesis.

## Use of Tables, Figures and Images

1. Tables, Figure and Images number in Arabic letters (no Romans)
2. Title/legends provided in no more than 40 words.
3. For borrowed materials – credit note must be provided in the figure/table/image itself.
4. Keep the table/figures simple and uncluttered as possible.
5. Standard abbreviation of units of measurement should be added in parentheses

## Use of Tables

**Rule of thumb:** Use tables to present data that is detailed and that is important

6. Avoid tables created with the tab key, pictures, and embedded objects
7. Fancy borders, shading, 3d effects, multiple grids are both distracting and unnecessary .
8. Prefer grey shades of tables and figures.
9. Scientific table have few horizontal lines and no vertical lines. Usually only three horizontal lines (above and below the column headings, below the table)
10. Tables should be formatted so that they have to be read horizontally (left to right) – the natural reading style

### Use of Figures

**Rule of thumb:** Use figures to - Show trends in data (as graphs)

11. Do not use Pie charts, 3d bar diagrams, as Figures
12. Figures should be simple to interpret, uncluttered, and free of extra lines, text, dimensions and other gimmicks.
13. Prefer common data-presentation formats in figures: Column charts/bar charts; Line charts; Scatter plots

### Use of Images/photographs

14. Do not create math equations or tables as pictures
15. For Images and photographs, use TIFF or a high resolution JPEG.
16. Figures necessitate good quality – 300dpi with minimum resolution of 800x600 pixel

### Relating to tables and figures in text

17. Refer to all the tables/figures in the text
18. Point out the relevant part(s) of a table/figure when referring to it
19. Do not restate all the information from tables/figures in the text of the paper
20. Tables/figures should not be used to highlight what has already been said in the paper

### Permissions

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### Drug names

Generic drug names should be used.

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Authors are strictly instructed to follow Vancouver system for citing scientific literature. Any manuscript reference not following Vancouver system will immediately be sent back to author for revision. Authors can get a comprehensive explanation of the system with practical examples in the following link: <http://www.lib.monash.edu.au/tutorials/citing/vancouver.html>.

Authors must also note that NHJ follows following variation in Vancouver style:

1. Superscripts must be used rather than brackets.
2. Numbers (citations) should be inserted before colons and semi-colons. (to the left)
3. Numbers (citations) should be inserted after comas and full stops. (to the right)
4. It is important that the punctuation and form is consistently applied to the whole document.

### Abbreviations

These are commonly used abbreviations to write in reference list

c. = circa (about, approximately)	ed. = edition
fig; figs = figure(s)	p. = page(s)
pt pts = part(s)	suppl= Supplement
ch. = Chapter	et al.. = and others
ill ills = illustrator(s)	para paras = paragraph(s)
rev = revised	

Guidelines on individual article types

### Editorial

This is written in each issue by the editor or members of editorial board and is not open for external authors unless invited.

### Original Articles

We publish all types of research articles, i.e. descriptive, analytical, and experimental. However, we believe that some descriptive studies fall under audit section more than as an original research article. Such articles which do not contribute substantially to existing knowledge or to new concepts, will be placed under AUDIT section of the journal.

Original Articles should have following headings in its manuscript:

- Title
- Abstract
- Key Words
- Introduction
- Methods
- Results
- Discussion
- Conclusion
- Limitation
- Acknowledgement
- References

## Original Article

### Title

- Complete title of the article
- Provide also Running title – not more than 50 characters
- Be short, accurate, and unambiguous giving your paper a distinct personality
- Begin with the subject of the study
- Avoid excessive adjectives and noun strings

### Abstracts

The abstract should contain the essence of the whole paper and should stand-alone. Be clear and concise and avoid unnecessary detail.

- Word limits – 250 words
- No abbreviation to be used in abstract
- Structured abstract - into following sub groups
  - Background
  - Objectives
  - Methods
  - Results
  - Conclusion

### Key Words

- Key Words – 3-7 words, arranged in alphabetical order
- Use Key Words from MeSH index –  
website <http://www.ncbi.nlm.nih.gov/mesh>

### Introduction

- Word limit – 250 words
- Introductions should be short and arresting and tell the reader why you undertook the study
- Divide the Introduction into three parts
  - a. The first paragraph should be a very short summary of the exiting knowledge of your research area.
  - b. This should lead directly into the second paragraph that summarizes what other people have done in this field, what limitations have been encountered with work to date, and what questions still need to be answered.
  - c. This, in turn, will lead to the last paragraph, which should clearly state what you did and why.
- Do not write conclusion in this section

### Methods

Basically, it should include three questions: How was the study designed? How was the study carried out? and How was the data analysed?

Mention following, in order of their appearance, and writing in past tense or passive verb

- I. Study type and study design
- II. Place and duration of study
- III. Sample size and Sampling method
- IV. Methods of data collection
- V. Ethical Approval and Patient consent
- VI. Inclusion and exclusion criteria
- VII. Protocols followed (if any)
- VIII. Statistical analysis and software used

You should give precise details of the questionnaires you used and how they were developed, validated, and tested for repeatability. If NHJ questions, you should be able to provide the questionnaire.

When the sample size is smaller than 40, the results are rarely believable, the summary estimates lack of precision, standard statistical methods may be inappropriate, and the generalizability of the results will be questionable. It is always important to include details of your sample size calculations.

For comparison. You must also describe the methods of randomization, allocation concealment and blinding of the research staff and the participants to study group allocation. You must also describe any procedures that you used to maximize or measure compliance with the interventions. If a drug is being tested, then the generic name, the manufacturer, the doses used and any other information should be included.

### Results

You should use an interesting sequence of text, tables, and figures to answer the study questions and to tell the story without diversions. Remember that results and data are not the same thing. You do not need to repeat numbers in the text that are already presented in a table or a figure.

- It is essential that you are consistent in the use of units in your reporting so that readers can make valid comparisons between and within groups. NHJ require you to use Système Internationale (SI) units
- Clearly present relevant data, and avoid data redundancy
- Only significant results must be shown under this heading
- Use a mixture of text, tables, and figures
- Avoid using percentages unless the group have more than 100 subjects
- When condensing results give the number of subjects, the range of results, the central tendency (mean $\pm$  SD), and the spread (confidence interval for the mean)

- If you have done an analysis of variance give the estimates with their degrees of freedom and p values
- Prepare tables and figures according to the instructions mentioned above
- Tables and illustrations/ graphs/ charts should not represent the same results. Use the space below the legend to show some important findings.
- Write all your result text under one section referring to appropriate legends.

### Template for Result, in order of their appearance

- I. Describe study sample. Who did you study?
- II. Univariate analyses - How many participants had what?
- III. Bivariate analyses - What is the relation between the outcome and explanatory variables?
- IV. Multivariate analyses - What is the result when the confounders and effect modifiers have been taken into account?

### Discussion

- Discuss major findings. It should not merely be a repetition of results section. Only duplicating data from results section into this heading is NOT allowed
- Avoid unnecessary explanation of someone else work unless it is very relevant to the study. Other studies should be quoted in relation to the findings of the present study.
- Provide and discuss with the literatures to support the study
- Mention about
  - a. Limitations of your study
  - b. Confounding factors
  - c. Possible implications which are not mentioned in the abstract

*An otherwise very good manuscript but with poor discussion may be rejected for the same reason*

### Conclusion

Template for Conclusion, in order of their appearance

- I. What did this study show? Address the aims stated in the Introduction
- II. Strengths and weaknesses of methods
- III. Discuss how the results support the current literature or refute current knowledge
- IV. Future directions “So what?” and “where next?” Impact on current thinking or practice

### Also make note of the following

- V. Give recommendation from your study

### Acknowledgement

Acknowledge any person or institute who have helped the study  
Make acknowledgement short and do not add praise or literature in this section

### References

Abide by NHJ guideline – Vancouver citation method.

Not more than 40 references for Original Article

### Legends

Table e.g. (Table 1) and Figure e.g. (Figure 3)

Put tables, charts, and figures at the end of the paper, after references



## Case Report

### Title

- Complete title of the article
- Provide also Running title – not more than 50 characters
- Be short, accurate, and unambiguous giving your paper a distinct outlook
- Begin with the subject of the study
- Avoid excessive adjectives and noun strings

### Abstracts

The abstract should contain the essence of the whole paper and should stand-alone. Be clear and concise and avoid unnecessary detail.

- Word limits – 150 words
- No abbreviation to be used in abstract
- Non Structured abstract

### Key Words

- Key Words – 3-7 words, arranged in alphabetical order
- Use Key Words from MeSH index –  
website <http://www.ncbi.nlm.nih.gov/mesh>

### Introduction

- Word limit – 150 words
- Introduce the case in short and highlight the importance of presenting it as a case report in the journal

### Case Report

- Reason for reporting this case
- Avoid waste words
- The report should detail: what happened to the patient, the time course of events, why the particular management was chosen

### Discussion

Provide and discuss latest literatures about your case report

Mention about limitation of the reporting, if any Valid written expressed consent from patient/s must be taken prior to involving any person in case note manuscript. The identity of the patient must not be revealed by text or figures. If the figure/picture tends to reveal the identity of the individual, it is the responsibility of the author to have explained so to the patient before submitting the manuscript

*Use the same guideline for Case Series Reporting*

*-- Acknowledgement, References and Legends to be used as mentioned above*

### Audits

Audit section may have similar sections like an original research article, i.e. abstract, introduction, methods, results, discussion, acknowledgements, references. Here, we publish papers that tend to give an audit of case records in one or more healthcare setting(s). The findings of audit articles provide the readers with a profile, or composition of cases occurring in wards or departments of the facility only.

If some study is done on a large scale enough which contributes to scientific literature reflecting important findings or contribution related to the country or some large geographic area, can then be better placed in an original research/ study section rather than an audit.

The decision as to whether a supposed original research article belongs to original research article itself or is published under the section of audit finally relies on the editorial board.

### Review articles

Review article must incorporate various aspects of the topic chosen, and should also incorporate latest researches and findings. It should not merely be a collection of quotes from textbooks or very old articles of journals that does not contribute anything new to the scientific literature base already available.

Ideal Contents of a review:

- What is the problem?
- Historical background
- Basic science
- Methodology
- Human studies
- Discussion
- Conclusions
- Recommendations
- The future

The ideal review should be topical, up to date, balanced, accurate, authoritative, quotable, provocative and a good read.

### Letter to the Editor

Letter to the Editor will be accepted or edited and published at the Editor's discretion. The author must give a full reference of the article published in NHJ while writing the letter to which he is referring. While writing be succinct (approximately 325 words) and address one or two major subjects regarding the article. Letters that, in the Editor's view, require a response from the authors of the article will be held pending notification of the authors, who will have fifteen days to respond. On receipt of an

author's response, the letter and the author response will be published in the journal and will also be posted in the web. If we do not receive an author response within fifteen business days, the letter will be published with a note stating, "The author has been invited to respond and has not done so."

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### Supplementary online material

Authors wishing to include additional material supporting a paper for which there is no space in the printed journal, may wish to have this made available online with the paper on the NHJ website. These supplementary materials must be submitted with the original manuscript and will be shown to the reviewers and the editors.

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### CHECKLIST

(Please make sure that you have addressed all the points mentioned in the checklist)

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The Cover page should carry the title, a short running title, total words count on abstract, total word count of manuscript, information of any disclaimers or funding bodies and the corresponding author's full names, qualifications, affiliations, departments, email and addresses of institute affiliated (street, city, country)

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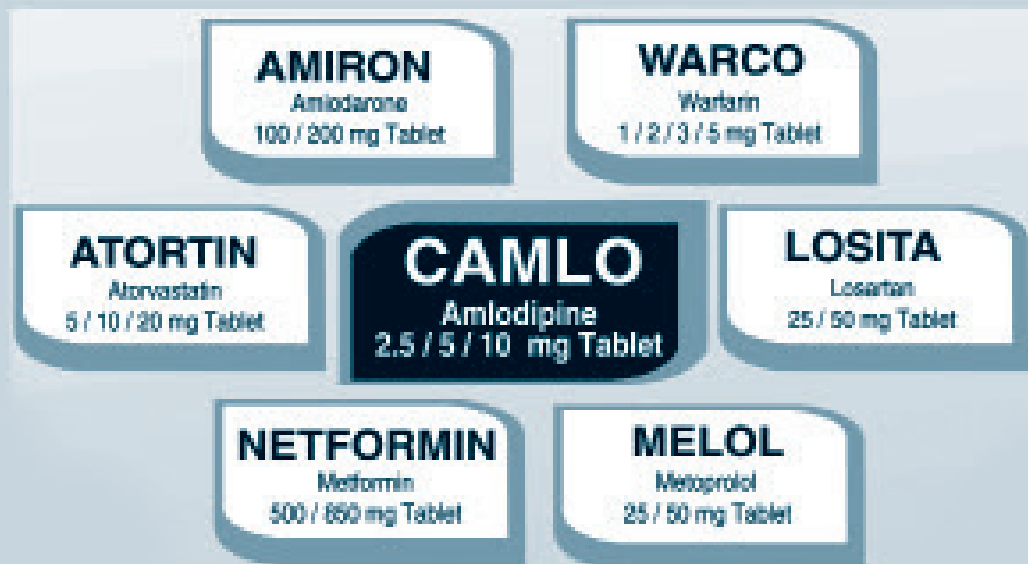


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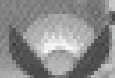
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