

## Cross-Sectional Study of Cardiac Diseases in Five Districts of Nepal

Laudari Shankar<sup>1\*</sup>, Tiwari Kaushal<sup>2</sup>, Gupta Madhu<sup>3</sup>, Panjiyar Rajesh<sup>3</sup>, Subedi Pawina<sup>4</sup> and G Subramanyam<sup>5</sup>

<sup>1</sup>Lecturer, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal

<sup>2</sup>Associate Professor, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal

<sup>3</sup>DM Resident, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal

<sup>4</sup>Medical Officer, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal

<sup>5</sup>Professor, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal

**\*Corresponding Author:** Laudari Shankar, Lecturer, Department of Cardiology, College of Medical Sciences-Teaching Hospital, Bharatpur, Nepal.

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### Abstract

**Objective:** To study the pattern of cardiac diseases in the different districts of Nepal.

**Methods:** This is a cross-sectional study conducted in five different districts of Nepal from 2nd October to 7th October 2016. Patients with suspected cardiac diseases were randomly screened in different parts of the country for systemic hypertension and diabetes mellitus followed by testing with two dimensional echocardiography.

**Results:** Total 1066 patients were screened and echocardiography was performed in 760 patients. 85 patients (11.18%) were diagnosed with rheumatic heart diseases. Ten patients were found to have atrial septal defect and 4 patients with ventricular septal defect.

All the patients underwent blood pressure measurement and random blood sugar check using glucometer. Forty three percent patients were suffering from systemic hypertension, out of which only 30 percent knew about their high blood pressure. In relation to diabetes in our screening, we found that 34% of patients had elevated random blood sugar. Majority of them (30%) were on treatment with anti-diabetic drugs.

**Conclusion:** There is fair large number of patients with cardiac diseases in the Nepalese community, the most common being rheumatic heart disease. Early diagnosis of cardiac diseases allows them to undergo specialized treatment, which will reduce morbidity and mortality in these patients. More effective and large sample screening should be carried out to diagnose hypertension, diabetes and other cardiac diseases.

**Keywords:** Cardiac Diseases; Screening; Nepal

### Introduction

Until recent time, it was communicable disease, which was the biggest healthcare burden for the developing countries like Nepal. However, this trend is changing and non-communicable disease like cardiac diseases and cancer are taking lead in the third world countries. Cardiac diseases, once disease of developed countries, is becoming one of the commonest disease and biggest killer in the developing countries.

Rheumatic heart disease (RHD) remains the most common acquired heart disease in children in many countries of the world, especially in developing countries. The global burden of disease caused by RHD currently falls disproportionately on children living in the developing world, and is responsible for about 233,000 deaths annually, especially where poverty is widespread [1,2].

In Nepal, 30% of patients in rural area are suffering from RHD. Out of which, 10 - 15% need urgent surgery to prevent lifelong disability and ultimately save their lives [2,3].

Overcrowding, poor housing conditions, malnutrition and lack of access to basic healthcare play a vital role in the persistence of this disease in developing countries. Whereas, the decline of RHD in developed countries is believed to be the result of improved living conditions, early screening and diagnosis and easy availability of antibiotics for treatment of group A streptococcal infection.

### Aim of the Study

The aim of our study was to reach to the general population living in villages of five different districts of Nepal (Bara, Parsa, Makawanpur, Chitwan and Nawalparasi) and screen them for cardiovascular diseases and their risk factors like diabetes and systemic hypertension. In addition, we aimed to provide them information regarding prevention, treatment and facilities available for them throughout the country.

### Methodology

We have organized five days free cardiac and diabetes screening camp by electrocardiogram (ECG), 2D-Echocardiography and checking random blood sugar as well as blood pressure measurement from 2<sup>nd</sup> October to 7<sup>th</sup> October 2016 in Kalaiya (Bara); Mahuwan (Parsa); Hetauda (Makawanpur); Padampur (Chitwan) and Danda (Nawalparasi) areas of Nepal. This program was technically supported by Department of Cardiothoracic and Vascular Surgery, Department of Cardiology at College of Medical Sciences, Teaching hospital, Bharatpur; Heart Fund Nepal, Bharatpur and Afrike Srdce, INGO, Prague, Czech Republic. Locally, programs were hosted by Janasarokar Sahakari Sangh, Kalaiya; Nawajivan Club, Mahuwan, Parsa; Hetauda hospital, Hetauda, Makawanpur; Rotary Club of Bharatpur and Padampur local village committee in Padampur, Chitwan; Lions Club of Nawalparasi and Midpoint Hospital Danda, Nawalparasi. Action Aid Nepal has helped to conduct this screening program by helping in transportation of the specialist to different places and printing pamphlets with the information about the heart disease and facilities available for the patients in need.

### Results

On first day in Kalaiya (Bara), we have screened 431 patients, out of which 280 underwent echocardiography of the heart. There were 222 males and 209 females patients. On 3<sup>rd</sup> October, we have screened total of 250 patients in Mahuwan Village, Parsa, out of which 175 underwent echocardiography. One hundred thirty five were males and 115 were females. On 3<sup>rd</sup> day, our screening program was organized in the Hetauda hospital, Hetauda, where total 115 patients (60 males, 55 females) were screened. Eighty five patients underwent echocardiography. Our fourth day screening took place in Padampur village, Chitwan with screening of 80 males and 70 females (150 patients) patients. Hundred twenty patients out of it underwent echocardiography. On the last day of our screen project, we have screened 120 patients (65 males and 55 females) in the Mid-Point Hospital, Danda, Nawalparasi. 100 patients underwent echocardiography. The sex distribution of the screened population is as follows in figure 1.

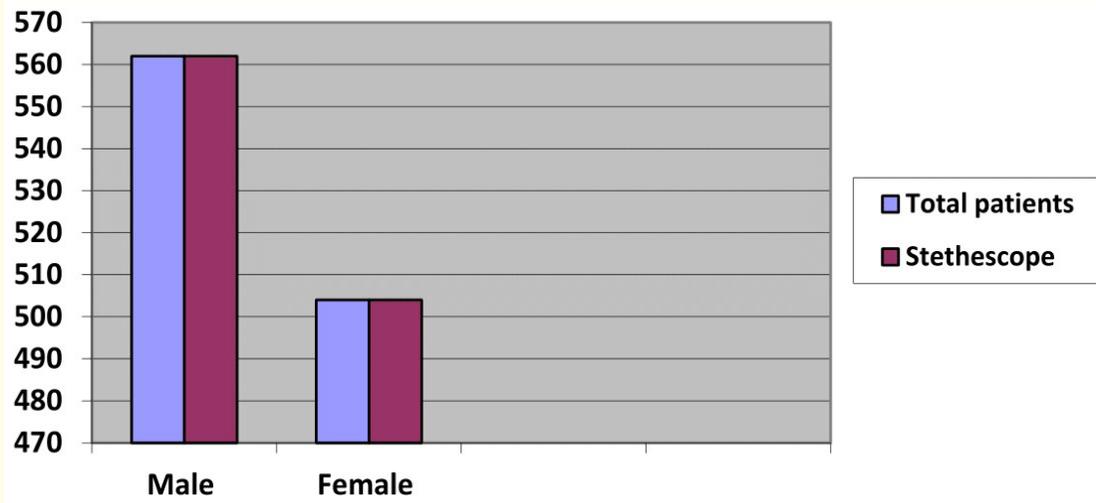


Figure 1: Sex distribution of the community screening program for cardiac diseases.

During these five days camp, we have screened 1066 patients and performed echocardiography in 760 patients. All 1066 patients underwent blood pressure measurement and random blood sugar check using glucometer. We have found 43% patients were suffering from systemic hypertension, out of which only 30 percent knew about their high blood pressure and 13% patients were unaware of their elevated blood pressure. Out of 30% percent with known high blood pressure, 5% were not taking any drugs. In relation to diabetes in our screening, we found that 34% of patients had elevated random blood sugar. Majority of them (30%) were on treatment with anti-diabetic drugs.

All 1066 patients underwent first screening with stethoscope auscultation. Those who were found to have any abnormal heart sounds underwent echocardiography. Total 760 patients underwent echocardiography. We found that 85 patients with rheumatic heart diseases had involvement of mitral and aortic valves. Ten patients were found to have atrial septal defect and 4 patients with ventricular septal defect. One patient found to be suffering from hypertrophic obstructive cardiomyopathy, a rare disease. One patient was found to have dextrocardia. Figure 2 shows the pattern of cardiac diseases in the screening population.

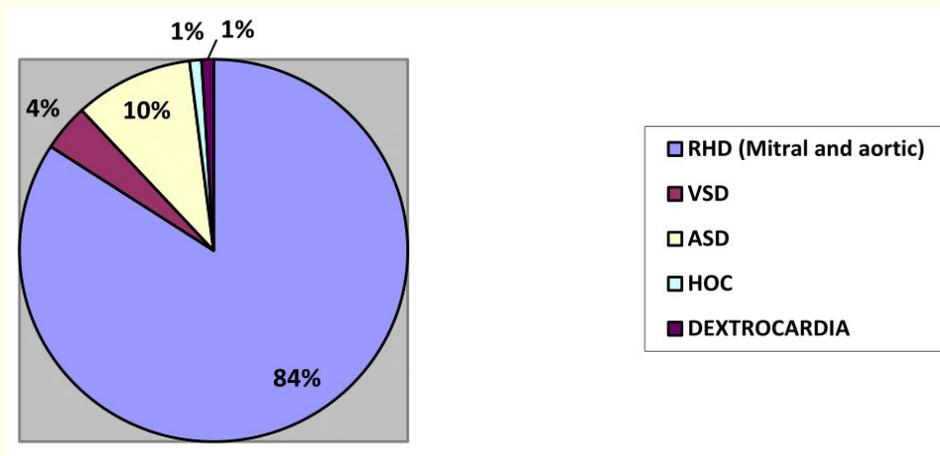
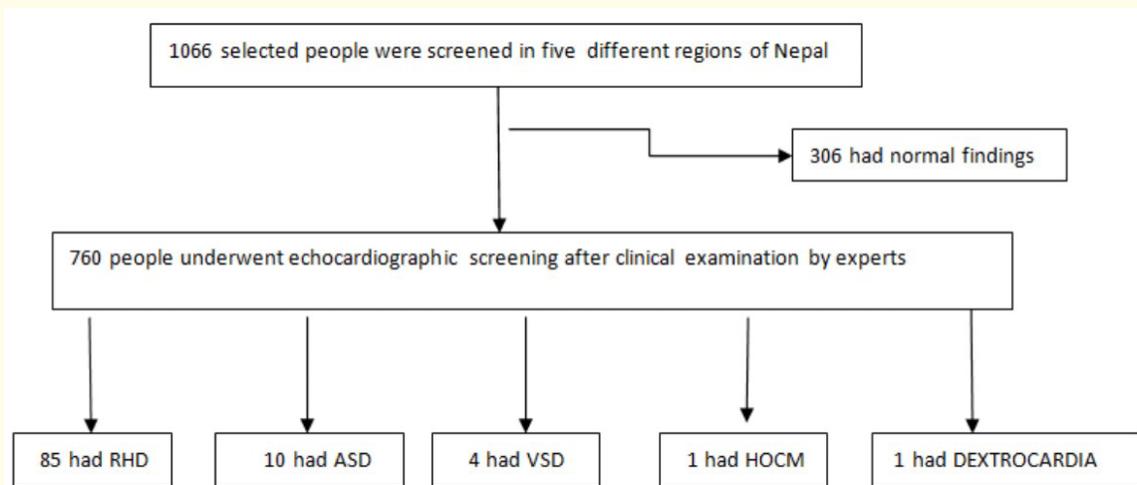


Figure 1: Distribution of cardiac diseases in the community screening program.

The below flowchart shows the community screening model for cardiac diseases.



**Flowchart 1:** Community screening for cardiac diseases.

We have advised patients with RHD and congenital heart diseases to undergo further investigation and treatment in nearby super specialized centers.

**Discussion**

Rheumatic heart disease is the commonest cardiac disease in children and young adults. It remains a major public health problem in developing countries especially in the rural areas.

Globally there are 15.6 - 19.6 million patients suffering from RHD out of which majority lie within Asian countries with burden estimated to be 10.8 - 15.9 million patients [3].

In our screening study, RHD was diagnosed in 11.18% of the total patients representing the most common entity. Studies on RHD from different parts of Nepal in the last two decades have shown the prevalence to vary from 1.2 to 1.35 per thousand school aged children [4-7].

RHD is a long-standing cardiac disease following acute rheumatic fever that can be prevented and controlled. Rheumatic fever is caused by preceding group A beta hemolytic streptococcal (strep.) infection of throat and occasionally skin. The major importance of RHD is its ability to cause fibrosis of heart valves, leading to crippling/malfunctioning valvular heart disease, heart failure and ultimately death if not managed timely [8]. Treating sore throat on time with antibiotics can prevent development of rheumatic fever and subsequent rheumatic heart disease. Moreover, if a patient gets infected, regular antibiotics (usually monthly injections or oral penicillin) can prevent patients with rheumatic fever from contracting further strep. infections and causing progression of heart valve damage [9].

In addition to RHD, due to change in life style, food habit, smoking, drug abuse, obesity and environmental pollution, other acquired cardiovascular diseases like hypertension, coronary artery disease, endocarditis and peripheral vascular disease are increasing in the developing countries.

In our community study, 43 percent of the patients were suffering from systemic hypertension, out of which only 30 percent knew about their high blood pressure. Similarly, 34 percent of patients had elevated random blood sugar. Majority of them (30%) were on treatment with anti-diabetic drugs.

Various small studies from different parts of the country carried out on the diverse populations have shown varying prevalence rates of these non-communicable diseases ranging from 6.3 to 8.5% [10].

A survey has shown that about 47% of urban population is suffering from systemic hypertension and about 15% are prone to acute coronary syndrome due to coronary artery disease [10].

Most of the acquired cardiovascular diseases are preventable, and if diagnosed on time, treatable with good results. Ironically, there are no such targeted programs in Nepal to screen, advice and direct these patients to a specialized center for treatment. Unavailability of such a screening services in Nepal is not a surprise, but is due to lack of fund, manpower and priority of the government of Nepal.

### Conclusion

Based on the results of these five days screening, we conclude that screening with echocardiography reveals many hidden rheumatic heart disease in patients unknown about their diseases. Diagnosis of their diseases on time allows them to undergo specialized treatment, which will reduce morbidity and mortality in these patients. Furthermore, undetected high blood pressure and diabetes are big problems in community and their early detection is very important to prevent cardiovascular diseases and sudden death in many patients.

We advise further such screening camps and awareness programs to decrease the increasing burden of cardiovascular disease in the health facilities deprived population of Nepal.

### Conflict of Interest

There is no conflict of interest including financial in publication of this article.

### Bibliography

1. Carapetis JR, *et al.* "Acute Rheumatic Fever". *Lancet* 366.9480 (2005): 155-168.
2. Global Health Observatory. World Health Organization (2011).
3. JR Carapetis. "Rheumatic heart disease in Asia". *Circulation* 118.25 (2008): 2748-2753.
4. Laudari Shankar, *et al.* "Study of prevalence of rheumatic heart disease and congenital heart disease among school children in central Nepal". *World Journal of Medicine and Medical Science Research* 3.2 (2015): 14-19.
5. Dipanker Prajapati, *et al.* "Epidemiological survey of rheumatic fever, rheumatic heart disease and congenital heart disease among school children in Kathmandu valley of Nepal". *Nepal Heart Journal* 10.1 (2013): 1-5.
6. S Laudari and G Subramanyam. "A study of spectrum of rheumatic heart disease in a tertiary care hospital in Central Nepal". *IJC Heart and Vasculature* 15 (2017): 26-30.
7. KC Man Bahadur, *et al.* "Prevalence of rheumatic and congenital heart disease in school children of Kathmandu valley in Nepal". *Indian Heart Journal* 55.6 (2003): 615-618.
8. Kameswari Maganti, *et al.* "Valvular Heart Disease: Diagnosis and Management". *Mayo Clinic Proceedings* 85.5 (2010): 483-500.

9. CM Otto. "Echocardiographic Evaluation of Valvular Heart Disease". In: C.M. Otto, R.O. Bonow (Eds.), *Valvular Heart Disease: A Companion to Braunwald's Heart Disease*, fourth ed. Saunders, Philadelphia (2013): 62-85.
10. Sharma SK., *et al.* "Prevalence of hypertension, obesity, diabetes, and metabolic syndrome in Nepal". *International Journal of Hypertension* (2011): 821971.

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