Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?

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The study was not funded by any source.

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None declared.
Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?

Author(s): Gauchan N, Rawat B, Vaidya A, Rajbhandari S, Bhatta Y, Jaiswal JP

Abstract

Background: Coronary heart disease is a rising cause of adult death in Nepal. Diagnostic and interventional facilities such as coronary angiography and angioplasty have also collaterally improved in Nepal over the last decade. This study explores the most common coronary vessels involved in the Nepalese population based on the coronary angiographic findings.

Methods: This is a retrospective study of 852 Nepalese patients who underwent coronary angioplasty from early 2002 to 2010 end at Norvic International Hospital, Kathmandu.

Results: Single vessel disease was most common (69.06%) followed by double vessel disease (25.84%) and triple vessel disease (5.10%). Left Anterior Descending artery was most frequently affected (56.0%) followed by Left Circumflex Artery (34.2%) and Right Common Artery (31.4%). Left Main coronary artery was found to be severely stenosed in 0.4% cases.

Conclusion: The study has shown that the most Nepalese patients presented with single vessel disease with Left anterior descending as the most frequent culprit artery.

Introduction

Cardiovascular disease is the most common cause of Nepalese adults’ death among which coronary artery disease (CAD) is by far the most frequent pathology [1]. It is estimated that about 5% of the adult population in the capital Kathmandu have severe CAD and the disease is increasing at an alarming rate [2]. A population-based prevalence study of coronary heart disease in Eastern Nepal has also shown a high prevalence of CAD that is comparable to the urban settings of North India [3]. Along with the rise in CAD and its risk factors, the last decade has also witnessed a rise in the diagnostic facilities and treatment modalities in the country. Coronary Angiography (CAG) began in Nepal at the turn of the millennium while Percutaneous Transluminal Coronary Angioplasty (PTCA) began a couple of years later in January 2002 at Norvic International Hospital.

The first PTCA was performed by Dr. Andreas Gruentzig on an awake patient in Zurich in 1977 [4]. Today this is the most widely used standard treatment of choice for acute coronary syndrome. Moreover with the use of drug eluting stents, even unstable angina are being treated with PTCA [5]. Research also shows that acute transfer for PTCA in patients with extensive myocardial infarction is feasible and safe [6]. In fact, a study shows that a delay for Primary PTCA in case of ST-Elevating Myocardial Infarction (STEMI) is considered as major risk factor for high risk mortality in STEMI patients [7]. Furthermore, multiple trials with meta-analysis have revealed that even after fibrinolysis, many patients may require mechanical revascularization [8]. However, PTCA itself also carries a risk of restenosis in about 10.2% -12.0% patients [9].

CAG which is done as the first step of PTCA can be an opportunity to learn how many and which vessels are commonly involved in those patients who undergo PTCA. Some studies have shown that Left Anterior Descending (LAD) coronary artery is the most common coronary artery involved [10]. As no study has been reported from Nepal, this study was conducted to explore the angiographic findings of patients undergoing PTCA at Norvic International Hospital and to find the magnitude of CAD in these patients.

Methods

Norvic International Hospital is a referral hospital in the capital Kathmandu and serves as the most frequently visited hospital for emergency and routine coronary procedures. With the state of the art modern equipment with digitalized imaging processes, it performs cardiac catheterizations and angioplasty on a regular basis on patients referred from all over Nepal. A retrospective study was conducted on Nepalese patients who underwent PTCA at Norvic International hospital from January 2002 to end of June 2010. Foreign patients and those who were treated with conservative management including thrombolysis
were not included in the study. For coronary angiography, CORDIS Judkins catheter of size 6F-JR4/JL4 with diameter 0.057” was used. Non-ionic dye OMNIVAC 350mg was injected to visualize the site of stenosis. Likewise, CORDIS Judkins catheter size 6F-JR4/JL4 with diameter 0.070 inch was used for PTCA. Angiographic images were recorded on a videotape for review and storage. Data was collected from cathlab database of all the patients who underwent PTCA. Written informed consent was obtained in all cases. This is invariably complemented by thorough pre- and post-procedure counseling of the patients and family members. An occlusion of 60% or more was considered as severe stenosis and that of

Results

A total of 917 patients had undergone PTCA during the nine year period out of which 852 were Nepalese. The annual number of these PTCA cases is shown in Illustration 1 demonstrates a steady rise in the PTCA cases over the previous nine years. Coronary angiographic findings performed prior to PTCA revealed that in these Nepalese PTCA patients, SVD was the most common presentation (69.06%), followed by DVD (25.84%) and TVD (5.10%). On analysis of vessels commonly involved, Left Anterior Descending (LAD) was most commonly involved (56.0%) , followed by Left Circumflex Artery (LCx, 34.2%), Right Coronary Artery (RCA, 31.4%) and Left Main coronary artery (LM, 0.4%) (Illustration 2). Some CAG snapshots showing stenoses are shown in Illustration 3.

Discussion

This study explored the magnitude of coronary artery disease in terms of number of vessel involved in the context of Nepal. We found that severe SVD (69.06%) presented more commonly than multi-vessel disease (MVD, 30.94%). Comparatively, in a Spanish population, Rafael [10] found the incidence of MVD (54%) to be more than SVD (46%). These variations could mean that ethnicity and geographic locations could play key roles in determining the coronary artery involvement and the severity of the artery involved. Role of ethnicity has been shown by Sempos S [11] in his study in which he coronary mortality variations among four major races in United States. One limitation of our study is that this population may not represent the whole spectrum of CAD patients of Nepal. This is because in the context of a developing country like Nepal, there are many who may remain undiagnosed or untreated, and in fact, only a very few patients can actually afford a relatively expensive procedure like PTCA.

Conclusion

This study highlights the coronary arteries that are commonly involved in the Nepalese patients who undergo PTCA. There is a rising epidemic of CAD in the Nepalese population. Changing lifestyle and urbanization, with their effects such as smoking, stressful life, poor quality food and sedentary lifestyle could be the underlying causes.

Acknowledgement(s)

The authors thank the cathlab staff for their contribution in data management of PTCA patients.

Authors Contribution(s)

Dr.Gauchan wrote the manuscript in collaboration with others. Dr. Rawat and Dr.Vaidya conceived the study idea. Dr. Vaidya was mainly involved in the analysis of the data. Dr. Rajbhandari, Dr. Jaiswal, Dr. Bhatta and Dr.Rawat were involved in the clinical works as well as for reviewing the manuscript drafts.

References

1. Suvedi BK. Of what diseases are Nepalese people dying? Kathmandu University Medical Journal (2007); 5: 121-123.
Prospective randomized comparison between thrombolysis, rescue PTCA and primary PTCA in patients with extensive myocardial infarction admitted to a hospital without PTCA facilities: A safety and feasibility study. Heart 1999; 82:426-431.


Illustrations

Illustration 1

Number of coronary angioplasty cases done in the Nepalese patients at Norvic International Hospital between 2002 and 2010.

Illustration 1

Illustration 2

Distribution of coronary artery disease according to the vessels involved. (LM - Left Main Artery, LAD - Left Anterior Descending Artery, LCx - Left Circumflex Artery, RCA - Right Coronary Artery)

Illustration 2
Illustration 3

Examples of coronary angiograms showing coronary artery stenoses
Reviews

Review 1

Review Title: Coronary artery disease patterns in Nepalese patients undergoing PCI.

Posted by Dr. Nikolaos Kakouros on 15 Apr 2012 09:21:52 PM GMT

1. Is the subject of the article within the scope of the subject category?  
   Yes
2. Are the interpretations / conclusions sound and justified by the data?  
   Yes
3. Is this a new and original contribution?  
   Yes
4. Does this paper exemplify an awareness of other research on the topic?  
   Yes
5. Are structure and length satisfactory?  
   No
6. Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience?  
   No
7. Can you suggest any reductions in the paper, or deletions of parts?  
   No
8. Is the quality of the diction satisfactory?  
   No
9. Are the illustrations and tables necessary and acceptable?  
   Yes
10. Are the references adequate and are they all necessary?  
    No
11. Are the keywords and abstract or summary informative?  
    Yes

Rating: 3

Comment:
The authors should be applauded for publishing the first retrospective study of angiographic findings in the ethnic population of Nepal. Additional information on the population considered, including demographics and risk factor profile would have been welcome to aid understanding of the observed pattern of disease. A more extensive treatise on the possible underlying factors would also have been appropriate, including the availability and use of primary and secondary prevention medical therapy as well as prevailing referral bias to coronary angiography. The manuscript could be further improved by more careful attention to grammar and orthography. For example, abbreviations are used interchangeably, and sometimes without prior definition (e.g. SVD, DVD) and the section on methods appears to end abruptly in mid-sentence. I suspect the missing information on how lesions were graded was intended to be here. Information on the pattern of disease on patients who underwent coronary angiography but no angioplasty is conspicuous in its absence.

I would encourage the authors to continue to prospectively gather data on their treatment population and track the evolution of risk factor profile and coronary disease patterns over the ensuing years.

Competing interests: None

Invited by the author to make a review on this article?  : No

Experience and credentials in the specific area of science:  
Interventional cardiologist

Publications in the same or a related area of science:  
No

How to cite: Kakouros N. Coronary artery disease patterns in Nepalese patients undergoing PCI.[Review of the article 'Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?' by ].WebmedCentral 1970;3(4):WMCRW001687
Review 2

Review Title: Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?

Posted by Prof. Marco M Ciccone on 28 Mar 2012 06:13:08 PM GMT

1. Is the subject of the article within the scope of the subject category? Yes
2. Are the interpretations / conclusions sound and justified by the data? No
3. Is this a new and original contribution? No
4. Does this paper exemplify an awareness of other research on the topic? No
5. Are structure and length satisfactory? No
6. Can you suggest brief additions or amendments or an introductory statement that will increase the value of this paper for an international audience? Yes
7. Can you suggest any reductions in the paper, or deletions of parts? No
8. Is the quality of the diction satisfactory? No
9. Are the illustrations and tables necessary and acceptable? Yes
10. Are the references adequate and are they all necessary? No
11. Are the keywords and abstract or summary informative? Yes

Rating: 2

Comment:
We have read through the manuscript and we think that the manuscript seems to show important and major lacking news:
- English should be completely revised by a native English speaker.
- The manuscript is too poor: no data about the population considered, no indications about the influence of each cardiovascular risk factor on the burden of coronary heart disease assessed by the coronary angiography
- The statistical analysis is completely not sufficient. After the data gathering about the population, each parameter should be weighted on CAD severity in order to assess the real impact of coronary heart disease in Nepalese population.

Competing interests: no

Invited by the author to make a review on this article?: No

Experience and credentials in the specific area of science:
Associate Professor in Cardiovascular Diseases, author of hundreds of international publication in atherosclerosis matter and correlation between peripheral artery diseases and coronary heart diseases

Publications in the same or a related area of science: Yes


How to cite: Ciccone M. Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe? [Review of the article 'Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?' by ]. WebmedCentral 1970;3(3):WMCRW001635
Review 3

Review Title: Coronary angiographic findings in Nepali patients

Posted by Dr. Srilakshmi Adhyapak on 05 Mar 2012 03:38:27 AM GMT

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Rating: 3

Comment:
This is a retrospective study. As the authors themselves report the increased diagnostic facilities over time have increased the detection of CAD. But, this study documents the degree of coronary artery involvement in an ethnic population of Nepal. The manuscript would have more value if the risk factors of CAD were also documented, in order to document any peculiarity of risk factor distribution in this population.

Competing interests: none

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science:
Interventional Cardiologist

Publications in the same or a related area of science: No

How to cite: Adhyapak S.Coronary angiographic findings in Nepali patients[Review of the article 'Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?' by ];WebmedCentral 1970;3(3):WMCRW001552
Review 4

Review Title: Azimi

Posted by Dr. Nassir A Azimi on 05 Mar 2012 03:08:19 AM GMT

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Rating: 7

Comment: Sheds light on the issue with angle of expertise well suited to the authors.

Competing interests: No

Invited by the author to make a review on this article? : No

Experience and credentials in the specific area of science: Literature review

Publications in the same or a related area of science: No

How to cite: Azimi N.Azimi[Review of the article 'Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?’ by J.WebmedCentral 1970;3(3):WMCRW001550
Review 5

Review Title: ARTICLE REVIEWED BY DR S S BANSAL:

Posted by Dr. S S Bansal on 11 Feb 2012 10:58:02 AM GMT

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Rating: 0

Comment:
Good retrospective study first of its kind in Nepal. It shows that single vessel disease is more common in around 70% of patients and multi vessel disease is less common whereas in a neighboring country like India, we do multi vessel angioplasty or bypass is more than half of our patients. It will be interesting to conduct a study to find out what percentage of patients have peripheral vascular disease (Carotid, Renal or limb vessels) in those undergoing angioplasty.

Invited by the author to make a review on this article? : Yes

Publications in the same or a related area of science: No

How to cite: Bansal S. ARTICLE REVIEWED BY DR S S BANSAL: [Review of the article 'Coronary Angiographic Findings of Nepalese Patients with Critical Coronary Artery Disease: Which Vessels and How Severe?' by ].WebmedCentral 1970;3(2):WMCRW001481
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