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Systematic Review

Prevalence, treatments and outcomes of coronary artery disease in Indians: A systematic review



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ABSTRACT

Aim: To conduct a systematic review on the prevalence, risk factors, treatments and outcomes of Coronary Artery Disease (CAD) in Indians.

Methods and results: We conducted a systematic review of studies in Indians with CAD from Jan 1969 to Oct 2012.

Initial search yielded 3885 studies and after review 288 observational studies were included. The prevalence of CAD in urban areas was 2.5%–12.6% and in rural areas, 1.4%–4.6%. The prevalence of risk factors was: smoking (8.9–40.5%), hypertension (13.1–36.9%) and diabetes mellitus (0.2–24.0%). The median time to reach hospital after an MI was 360 min. In hospital rates of drug use were: antiplatelets 68%–97.9%, beta blockers 47.3%–65.8% and ACEIs 27.8–56.8%.

Conclusions: In this first systematic review of CAD in India, prevalence of risk factors is high, treatments delayed and use of evidence based treatments variable.

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1. Introduction

The burden of cardio vascular disease (CVD) is on the rise globally. Cardiovascular deaths account for 30% of deaths world wide.¹ The burden of CVD is projected to be the highest in India by the year 2020, as compared to other countries.² In the WHO-PREMISE study, the proportion of coronary heart disease (CHD) among patients less than 50 years of age, was highest in India (22.6% in males and 3% in females).³ In the Million Death Study (2009) the authors determined that cardiovascular diseases are the leading cause of death (20.3% in males and 16.9% in females) among Indian adults (age 25–69 years).⁴ Yet it is difficult to get a comprehensive picture of the epidemiology and disease burden of coronary artery disease (CAD) in India. One systematic review of 31 studies in India reported that the prevalence of CAD is higher in urban as compared to the rural areas (Men 35–90/1000 vs. 17–45/1000; Women 28–93/1000 vs. 13–43/1000).⁵

In order to implement nation-wide policies to control CAD, we need a comprehensive view of its different aspects such as the disease burden, manifestations, treatment patterns and outcomes of the condition. We therefore conducted a systematic review of all the observational studies to record the available evidence on the epidemiology, risk factors, clinical presentations, management and outcomes of coronary artery disease among Indians residing in India.

2. Methods

A systematic review of all studies in Asian Indians with coronary artery disease addressing the epidemiology, risk factors, clinical presentations, management or outcomes of CAD among Indians.

2.1. Studies included

We included all studies from January 1969 to October 2012, pertaining to coronary artery disease and its treatments. The diagnosis of coronary artery disease was not uniform across different studies. The diagnosis was based on history of angina or myocardial infarction or electrocardiographic findings. Treatment of CAD included both prescribed drugs (in hospital based studies) and self-reported use of medications (in community based studies). We only included studies in English. As English is the primary medium of scientific communication in India, we are confident that we have been able to include all the relevant studies in this review. Amongst the studies that were excluded were: articles without original data (letters to the editor, comment and narrative review); studies conducted among Indians residing outside India and international studies without separate data on Indians.

2.2. Search strategy and data extraction

Two independent reviewers conducted a systematic search of Medline as well as extensive hand searches using the following pre-specified MeSH terms and search strategies: Search #1: Heart diseases OR myocardial ischemia OR

coronary disease OR coronary artery disease OR coronary arteriosclerosis OR coronary atherosclerosis OR Ischemic Heart Disease; Search # 2: India OR Indians OR South Asia; and Search #3: combined #1 and # 2.

Duplicates were removed using Reference Manager (version 12). Relevant studies were selected for data extraction based on pre-specified eligibility criteria. Disagreements between the two reviewers on the selection of articles were resolved by discussions with a third reviewer.

We assessed study quality using parameters specified in the STROBE statement.⁶ The parameters for different observational study designs were specified and are described here. For cohort studies we used indicators of eligibility criteria, source of cohort, methods of selection, and methods of follow up. The maximum score was 4 and minimum was 0. For case-control and cross-sectional studies the parameters included were as follows: eligibility criteria, ascertainment of cases and controls and the rationale for the choice of cases and controls. For cross sectional studies, eligibility specified, ascertainment of cases and rationale for inclusion of cases, were the parameters. The maximum score possible was 3 and the minimum was 0. Using a structured format, the following data were independently extracted: year, type of study, sample size, patient characteristics, incidence, prevalence, risk factors, manifestations, treatments and outcomes of CAD.

3. Results

The initial search yielded 3885 studies. Of these, a total of 111 studies were excluded as they were either studies with Indians combined with other South Asians (20) or studies conducted among Indians living outside India (91). We found 37 RCTs in our search and none of them looked at clinical outcomes. After removing duplicates and reviewing the title and abstract for relevance, 342 observational studies were identified. Fifty four of the 342 articles were editorials, letter to the editor, comment and did not contain original data. We extracted data from 288 observational studies (cohort 12 [4.2%], case control 57 [19.8%], cross sectional 180 [62.5%] and mixed methods 39 [13.5%]) (Fig. 1). Of these there were sufficient data in 59 studies for further analyses (Chi-squared and time trend analysis).

3.1. Quality of the studies included (Table 1)

Among the observational studies (288), we were able to assess the quality for 194 (68.3%) studies that had evaluable data. The data were insufficient to assess the quality in other studies. Of the 194 studies, 131 (67.5%) studies scored 2, and only 2 studies (1.0%) obtained the maximum score of 4.

3.2. Incidence and prevalence of CAD

There were two community based studies that had data on the incidence of CAD. The study by Chadha et al in 1993 conducted in urban Delhi included 4151 subjects (25–64 years of age) and followed up for 3 years, reported an incidence of CAD as 19.7/1000 (male 17.3 and female 21.0).⁷ The study by

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