A STUDY OF CORONARY DOMINANCE IN POPULATION OF JALGAON REGION OF NORTH MAHARASHTRA BY ANGIOGRAPHIC METHOD

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ABSTRACT

Introduction: The incidence of coronary artery disease is increasing now a day's all over the world. Dominance pattern of the heart has got important clinical significance in different pathologies. So the present work is undertaken to study the dominance of coronary arteries in population of Jalgaon region of North Maharashtra, India.

Aim and objectives: Aim of the present study was to determine dominance pattern of coronary arteries in Jalgaon region and to compare it with other studies.

Material and Method: The subjects (n=1000) attending cardiology outpatient department (OPD) at Dr. Ulhas Patil Medical College and Hospital, Jalgaon Kh. formed the study group for this study. Invasive coronary angiography was performed by either femoral or radial route using radio-opaque dye and cineangiograms were taken in different views. Using Schlesinger's criteria, the coronary dominance was determined

Results: In 82.4% of the subjects, right dominance was noted. In 13.3% of the subjects, left dominance was noted. Balanced dominance was noted in 4.3% of the subjects studied.

Conclusion: Balanced dominance is significantly less in Jalgaon region of northern Maharashtra when compared with results of most other studies. Similarly right dominance is significantly more in this area when compared with results of most other studies. So it can be concluded that every region carries its own proportions of dominance and detailed studies should be conducted for betterment of human being in each region.

KEY WORDS: Coronary dominance, Right dominance, Left dominance, balanced dominance, Angiographic method and Schlesinger's criteria.

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INTRODUCTION

Coronary artery disease is one of the major causes of death in developed countries. The incidence of coronary artery disease is increasing today in developing countries as well, because of changing life style, urbanization, sedentary nature of work, hypertension, diabetes mellitus and increased type A personality.

Coronary artery disease is responsible for over 70% of sudden cardiac deaths. In the young, the primary cause of death is non atherosclerotic coronary abnormalities [1].

As per different criteria's stated time to time, coronary dominance is determined. Dominance pattern of the heart has got important clinical significance. Left dominance was found to have

significantly higher mortality than right dominance and mixed types [2]. Dominance also plays important role in inferior wall infarcts of the heart. Inferior wall infarcts although less extensive than anterior infarcts, are more important as they can cause various degrees of atrioventricular blocks in approximately 30% of cases. The dominanat right coronary artery usually supplies atrioventricular node. Therefore an inferior wall infarcts caused by occlusion of right coronary artery will have higher risk of AV blocks [3].

So the present work is undertaken to study the dominance of coronary arteries in population of Jalgaon region, India.

MATERIALS AND METHODS

Materials: The subjects attending cardiology outpatient department (OPD) at Dr. Ulhas Patil Medical College and Hospital, Jalgaon Kh. formed the study group for this study. Out of them, some were known or newly diagnosed heart disease patients while some were healthy individuals who had been to us for routine cardiac check up. All were included in study group as any cardiac disease, social status, profession; religion does not affect coronary dominance once it is decided antenatally. Sample size for this study consisted of 1000 individuals undergoing invasive coronary angiography.

Method: Invasive coronary angiography was performed by either femoral or radial route using radio-opaque dye and cineangiograms were taken in different views. Using Schlesinger's criteria, the coronary dominance was determined by eminent cardiologist. This data was analysed and conclusions were drawn.

RESULTS

Schlesinger's criterion was used to determine coronary dominance. According to it, the dominance of the coronary artery is determined by the posterior interventricular artery. It is termed as right dominance if the posterior interventricular artery is a branch of right coronary artery. If the posterior interventricular artery is a branch of left coronary artery, it is termed as left dominance. If posterior interventricular groove contains branches from both right and left coronary arteries, it is labeled as balanced dominance.

Table 1: Table Showing Dominance in Coronary Circulation.

DOMINANCE	NO. OF SUBJECTS	PERCENTAGE
RIGHT	824	82.40%
LEFT	133	13.30%
BALANCED	43	4.30%

Graph 1: Coronary Dominance. (In percentage).
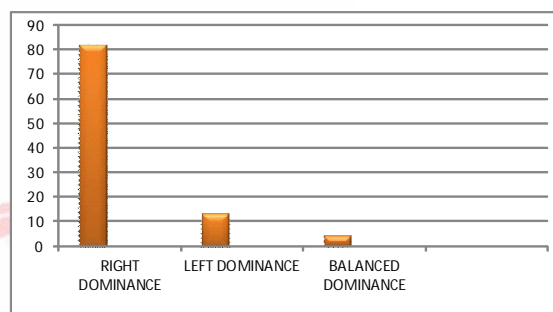
In 82.4% of the subjects, right dominance was noted. In 13.3% of the subjects, left dominance was noted. Balanced dominance was noted in 4.3% of the subjects studied.

DISCUSSION

Considering clinical significance of coronary arterial dominance, number of studies has been conducted all across the world till date. Different methods have been employed for the same. Angiographic method is one of them. In 1938, Schlesinger [4] considered the reference point indicating dominance consisted of determining which coronary artery supplied the posterior inter ventricular branch and which branches went beyond the crux cordis. Other criteria's like lengths [5] of right coronary artery and left marginal artery, layout [6] of arteries at the apex of heart, length [7] of paraconal inter ventricular artery, number [8] of branches to ventricles are also stated in the literature.

In majority of the previous studies, percentage of right dominance exceeds over that of left dominance. The incidence of right dominance ranges from 48% to 83.6%. In the present study, right dominance was noted in 82.4% of the subjects studied which is resembling closely with result of studies of Goldberg et al and Knappen et al. [13] Incidence of left dominance ranges from 8% to 18% in various previous studies. In present study, it was noted in 13.3%

of specimens which is closely resembling with result of studies of Kaimkhani et al [9]. Balanced dominance was less commonly noted in all previous studies except that of Schlesinger. Incidence of balanced dominance ranges from 8.2% to 34% in various previous studies. Balanced dominance was noted in only 4.3% of subjects in present study.

Table 2: Showing Comparison of Coronary Arterial Dominance (In Percentage).

STUDIES	CORONARY ARTERIAL DOMINANCE		
	RIGHT	LEFT	BALANCED
Schlesinger [4]	48	18	34
Kaimkhani et al [9]	60.45	15	24.5
Goldberg et al [10]	83.6	8.2	8.2
Abdellah AAA et al [11]	77	8	15
Fazlul et al [12]	60.5	19.5	20
Knappen M et al [13]	81.2	9.1	9.7
Kannan U. et al [14]	70	16.66	13.33
Present Study	82.4	13.3	4.3

It is observed in left dominant hearts that left anterior descending artery wraps around apex of heart and supplies majority of inferior surface of heart. In right dominance, the posterior interventricular branch of right coronary artery supplies it, reducing the territory supplied by left anterior descending artery. So left anterior descending artery lesions would be more severe in left dominant systems as compared to that in right dominant ones.

Dominance also plays important role in inferior wall infarcts of the heart. Inferior wall infarcts although less extensive than anterior infarcts, are more important as they can cause various degrees of atrioventricular blocks in approximately 30% of cases. The dominant right coronary artery usually supplies atrioventricular node. Therefore an inferior wall infarcts caused by occlusion of right coronary artery will have higher risk of AV blocks [3].

On application of test of significance, it is noted that balanced dominance is significantly less in Jalgaon region of northern Maharashtra when compared with results of most other studies. Similarly it is also noted that right dominance is significantly more in this area when compared with results of most other studies. From all this, we can come to a conclusion that every region

carries its own proportions of dominance and detailed studies should be conducted for betterment of human being in each region.

A descriptive ante mortem study like the present study can give an overview about the anatomy of the coronary arteries in individuals of Jalgaon region, Maharashtra, India. A large sample size is always very important in such epidemiological studies. Routine autopsy studies of hospital deaths should be encouraged. These findings correlated with angiographic study may result in developing a comprehensive epidemiological data pool. These data may be helpful in planning research. Due to limitation of resources all age groups were not included in the present study. Further studies with large sample size with wider age group using different methods like corrosive cast and dissection method are recommended.

Conflicts of Interests: None

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