

The Study of Association Between Handedness, Coronary Dominance and Severity of Lesions in Coronary Artery Branches

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Abstract

Objective: To determine the association between handedness, coronary dominance and severity of lesions in coronary artery branches. **Methods:** A total of 96 patients (64 male and 32 female) with an ages between (25-76) years old, ages range (51) and age mean \pm SD (57.4063 ± 8.84793) were diagnosed with ischemic heart diseases a proved by coronary angiography, 32 patients presented with family history to ischemic heart diseases and 64 patients without family history to ischemic heart diseases. **Results:** The current results showed significance between handedness and coronary dominance (<0.001) and handedness with lesion and severity in left anterior descending, right coronary dominance, left circumflex, and left main stem. Otherwise the family history and sex and coronary dominance with lesion and severity in left anterior descending, right coronary dominance, left circumflex, and left main stem (<0.001). **Conclusion:** The study proved the presence of a relationship between handedness and coronary dominance; moreover we suggested there are relations between right handed and right coronary dominance with focal mid lesion in left anterior descending and right coronary.

Keywords: Handedness, Coronary dominance, Coronary angiography

INTRODUCTION

In 1904, Banchi was described the coronary circulation (GAWLIKOWSKA-SROKA *et al.* 2010). There are 3 types of circulation dominance: right, left, and balanced. When the arteries supplying the posterior interventricular septum originate from posterior descending artery and posterior lateral right coronary artery, it is called "right dominant (RD)" circulation. The dominance of right circulation is common in about 87-89% of the general population. The term "left dominance (LD)" refers to origination of the arteries supplying the posterior interventricular septum from left circumflex artery (LCX). The rate of the dominance of left circulation for the general population is about 7-8%. In co-dominance (balanced) circulation, however, the branches that run to the interventricular septum originate both from the RCA and LCX. The rate of co-dominance in the general population is around 4% (Gorlin 1976). The impact of association between coronary dominance and cardiac diseases, arteries lesions mentioned previously (LAM *et al.* 2015; MORRIS *et al.* 2010). Furthermore, handedness is a characteristic human trait. Even in our closest genetic relatives hand preference is not pronounced (SZAFLARSKI *et al.* 2012). The aims of the study are to determine the association between coronary dominance and handedness in unique and novel study among Iraqi population, sex and coronary dominance, sex and coronary artery and its branches lesions, family history of ischemic heart disease and coronary dominance, family history and coronary artery and its branches lesions, coronary dominance and coronary artery and its branches lesions.

PATIENT AND METHOD

Cases selection

A total of 96 patients (64 male and 32 female) with an ages between (25-76) years old, ages range (51) and age mean \pm SD (57.4063 ± 8.84793) were diagnosed with ischemic heart diseases a proved by coronary angiography, 32 patients presented with family history to ischemic heart diseases and 64 patients without family history to ischemic heart diseases were enrolled from the November 2016 till January 2017 included in our study and recruited at Iraqi center for heart diseases, medical city, Baghdad, Iraq. The Ethics Committees of participating and Iraqi center for heart diseases approved the study, and informed consent was obtained from all participants

Coronary angiography

All the patients underwent angiography study, the patients admitted to the ward for a few hours beforehand to check out general health of patients and to prepare them for the angiogram, the warfarin that taking usually by some patients is already stopped previously, the procedure traditionally done by injecting a radio-opaque contrast agent into the blood vessel and imaging using X-ray based techniques.

Statistical Analysis

Statistical analysis done by using statistical package for social studies (SPSS 22). Associations between different variables were measured by using the Pearson Chi-Square test. P value of <0.05 considered as level of statistically significance, Odds ratio and 95% confidence interval (95% CIs) were calculated for different studied parameters. The confidence interval (CI) at 95% was used to describe the amount of uncertainty associated with

the samples.

RESULTS

Table 1: shown the relationship between the sex and coronary artery dominance

| Sex | Coronary dominance | | | p value | 95% Confidence Interval | | |
|--------|-----------------------------|--------|--------|---------|-------------------------|-------------|--------|
| | Right | Left | Total | | Lower Bound | Upper Bound | |
| Male | Count | 60 | 4 | <0.001 | (0.001-0.002) | | |
| | % within sex | 93.8% | 6.3% | | | | 100.0% |
| | % within coronary dominance | 69.0% | 44.4% | | | | 66.0% |
| | % of Total | 61.9% | 4.1% | | | | 66.0% |
| Female | Count | 27 | 5 | | | | 32 |
| | % within sex | 84.4% | 15.6% | | | | 100.0% |
| | % within coronary dominance | 31.0% | 55.6% | | | | 33.0% |
| | % of Total | 27.8% | 5.2% | | | | 33.0% |
| Total | Count | 87 | 9 | | | | 96 |
| | % within sex | 89.7% | 9.3% | | | | 100.0% |
| | % within coronary dominance | 100.0% | 100.0% | | | | 100.0% |
| | % of Total | 89.7% | 9.3% | | | | 100.0% |

Our results revealed significance difference among sex group correlated with coronary dominance ($P < 0.001$) according to statistical analysis as shown in the table 1, (60 male with right coronary dominant and 4 male with left coronary dominant, while 27 female with right coronary dominant and 5 female with left coronary dominant).

Significance at < 0.05

Table 2: shown the relationship between the sex and sites, severity of lesion in left main stem

| Sex | left main stem (LMS) | | | | | Total | p value | 95% Confidence Interval | | |
|--------|-------------------------|-----------|--------------|--------------|--------------------------|--------|---------|-------------------------|-------------|--------|
| | Normal | Focal mid | Focal distal | Focal ostial | Focal distal bifurcation | | | Lower Bound | Upper Bound | |
| Male | Count | 56 | 2 | 4 | 1 | 1 | <0.001 | (0.025-0.031) | | |
| | % within sex | 87.5% | 3.1% | 6.3% | 1.6% | 1.6% | | | | 100.0% |
| | % within left main stem | 65.1% | 66.7% | 80.0% | 100.0% | 100.0% | | | | 66.0% |
| | % of Total | 57.7% | 2.1% | 4.1% | 1.0% | 1.0% | | | | 66.0% |
| Female | Count | 30 | 1 | 1 | 0 | 0 | | | | 32 |
| | % within sex | 93.8% | 3.1% | 3.1% | .0% | .0% | | | | 100.0% |
| | % within left main stem | 34.9% | 33.3% | 20.0% | .0% | .0% | | | | 33.0% |
| | % of Total | 30.9% | 1.0% | 1.0% | .0% | .0% | | | | 33.0% |
| Total | Count | 86 | 3 | 5 | 1 | 1 | | | | 96 |
| | % within sex | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | | | | 100.0% |
| | % within left main stem | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | | 100.0% |
| | % of Total | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | | | | 100.0% |

Significance at < 0.05

On the other hand the statistical interpretation shown strong difference between sex group and sites, severity of lesion in left main stem ($P < 0.001$) as shown in the table 2, (56 male was normal, 2 male with focal mid, 4 male with focal distal, 1 male with focal ostial and 1 male with focal distal bifurcation, respectively, while 30 female was normal, 1 female with focal mid, 1 female with focal distal, 0 female with focal ostial and 0 female with focal distal bifurcation respectively).

On the other hand the statistical analysis shown significance difference between sex group and sites,

severity of lesion in left circumflex (P <0.001) as shown in the table 3, (47 male was normal, 4 male with focal mid, 6 male with focal distal, 3 male with focal proximal, 1 male with diffuse mid bifurcation, 1 male focal proximal rimas intermediate, 0 male diffuse proximal, I male total mid and 1 male with total distal), while (23 female was normal, 1 female with focal mid, 3 female with focal distal, 4 female with focal proximal, 0 female with diffuse mid bifurcation, 0 female focal proximal rimas intermediate, 1 female diffuse proximal, 0 female total mid and 0 female with total distal, respectively).

Table 3: shown the relationship between the sex and sites, severity of lesion in left circumflex

| Sex | left circumflex (LCX) | | | | | | | | | | Total | p value | 95% Confidence Interval | |
|--------|--------------------------|-----------|--------------|----------------|-------------------------|-----------------------------------|------------------|-----------|--------------|--------|--------|---------|-------------------------|-------------|
| | Normal | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Focal proximal rimas intermediate | Diffuse proximal | Total mid | Total distal | Total | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | | |
| Male | Count | 47 | 4 | 6 | 3 | 1 | 1 | 0 | 1 | 1 | 64 | <0.001 | (0.042-0.050) | |
| | % within sex | 73.4% | 6.3% | 9.4% | 4.7% | 1.6% | 1.6% | .0% | 1.6% | 1.6% | 100.0% | | | |
| | % within left circumflex | 67.1% | 80.0% | 66.7% | 42.9% | 100.0% | 100.0% | .0% | 100.0% | 100.0% | 66.0% | | | |
| | % of Total | 48.5% | 4.1% | 6.2% | 3.1% | 1.0% | 1.0% | .0% | 1.0% | 1.0% | 66.0% | | | |
| Female | Count | 23 | 1 | 3 | 4 | 0 | 0 | 1 | 0 | 0 | 32 | | | |
| | % within sex | 71.9% | 3.1% | 9.4% | 12.5% | .0% | .0% | 3.1% | .0% | .0% | 100.0% | | | |
| | % within left circumflex | 32.9% | 20.0% | 33.3% | 57.1% | .0% | .0% | 100.0% | .0% | .0% | 33.0% | | | |
| | % of Total | 23.7% | 1.0% | 3.1% | 4.1% | .0% | .0% | 1.0% | .0% | .0% | 33.0% | | | |
| Total | Count | 70 | 5 | 9 | 7 | 1 | 1 | 1 | 1 | 1 | 96 | | | |
| | % within sex | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |
| | % within left circumflex | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |

Significance at <0.05

The statistical analysis shown strong evidence between sex group and sites, severity of lesion in left anterior descending (P <0.001) as shown in the table 4, (19 male was normal, 1 male with focal ostial, 1 male with diffuse mid long, 1 male with ostial dicanal 1, 2 male with focal proximal dicanal 1, 18 male with focal mid, 0 male with focal distal , 5 male with focal proximal, 1 male with diffuse mid bifurcation, 2 male with total proximal, 6 male with diffuse proximal, 4 male with total mid and 4 male with focal ostial dicanal 1), otherwise (15 male was normal, 0 male with focal ostial, 0 male with diffuse mid long, 0 male with ostial dicanal 1, 1 male with focal proximal dicanal 5, 2 male with focal mid, 3 male with focal distal , 1 male with focal proximal, 0 male with diffuse mid bifurcation, 3 male with total proximal, 2 male with diffuse proximal, 0 male with total mid and 32 male with focal ostial dicanal 1).

Table 4: shown the relationship between the sex and sites, severity of lesion in left anterior descending

| Sex | Left anterior descending (LAD) | | | | | | | | | | | | | | Total | p value | 95% Confidence Interval | |
|--------|-----------------------------------|--------------|------------------|---------------|-----------------------|-----------|--------------|----------------|-------------------------|----------------|------------------|-----------|---------------------|-------------|--------|---------|-------------------------|--|
| | Normal | Focal ostial | Diffuse mid long | Ostial distal | Focal proximal distal | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Total proximal | Diffuse proximal | Total mid | Focal ostial distal | Lower Bound | | | Upper Bound | |
| Male | Count | 19 | 1 | 1 | 1 | 2 | 18 | 0 | 5 | 1 | 2 | 6 | 4 | 4 | 64 | <0.001 | (0.015-0.020) | |
| | % within sex | 29.7% | 1.6% | 1.6% | 1.6% | 3.1% | 28.1% | .0% | 7.8% | 1.6% | 3.1% | 9.4% | 6.3% | 6.3% | 100.0% | | | |
| | % within Left anterior descending | 55.9% | 100.0% | 100.0% | 100.0% | 66.7% | 78.3% | .0% | 62.5% | 50.0% | 100.0% | 66.7% | 66.7% | 100.0% | 66.0% | | | |
| | % of Total | 19.6% | 1.0% | 1.0% | 1.0% | 2.1% | 18.6% | .0% | 5.2% | 1.0% | 2.1% | 6.2% | 4.1% | 4.1% | 66.0% | | | |
| Female | Count | 15 | 0 | 0 | 0 | 1 | 5 | 2 | 3 | 1 | 0 | 3 | 2 | 0 | 32 | <0.001 | (0.015-0.020) | |
| | % within sex | 46.9% | .0% | .0% | .0% | 3.1% | 15.6% | 6.3% | 9.4% | 3.1% | .0% | 9.4% | 6.3% | .0% | 100.0% | | | |
| | % within Left anterior descending | 44.1% | .0% | .0% | .0% | 33.3% | 21.7% | 100.0% | 37.5% | 50.0% | .0% | 33.3% | 33.3% | .0% | 33.0% | | | |
| | % of Total | 15.5% | .0% | .0% | .0% | 1.0% | 5.2% | 2.1% | 3.1% | 1.0% | .0% | 3.1% | 2.1% | .0% | 33.0% | | | |
| Total | Count | 34 | 1 | 1 | 1 | 3 | 23 | 2 | 8 | 2 | 2 | 9 | 6 | 4 | 96 | <0.001 | (0.015-0.020) | |
| | % within sex | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | |
| | % within Left anterior descending | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | |

Significance at <0.05

Table 5: shown the relationship between the sex and sites, severity of lesion in right coronary artery

| Sex | Right coronary artery | | | | | | | | | Total | p value | 95% Confidence Interval | |
|--------|-------------------------|-----------|--------------|----------------|---------------------|----------------------------|-------------|-----------|--------|--------|---------|-------------------------|-------------|
| | Normal | Focal mid | Focal distal | Focal proximal | Focal mid RV branch | diffuse distal bifurcation | Diffuse mid | Total mid | | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | |
| Male | Count | 36 | 13 | 3 | 1 | 1 | 1 | 7 | 2 | 64 | <0.001 | (0.007-0.011) | |
| | % within sex | 56.3% | 20.3% | 4.7% | 1.6% | 1.6% | 1.6% | 10.9% | 3.1% | 100.0% | | | |
| | % within right coronary | 60.0% | 81.3% | 100.0% | 33.3% | 100.0% | 100.0% | 77.8% | 66.7% | 66.0% | | | |
| | % of Total | 37.1% | 13.4% | 3.1% | 1.0% | 1.0% | 1.0% | 7.2% | 2.1% | 66.0% | | | |
| Female | Count | 24 | 3 | 0 | 2 | 0 | 0 | 2 | 1 | 32 | | | |
| | % within sex | 75.0% | 9.4% | .0% | 6.3% | .0% | .0% | 6.3% | 3.1% | 100.0% | | | |
| | % within right coronary | 40.0% | 18.8% | .0% | 66.7% | .0% | .0% | 22.2% | 33.3% | 33.0% | | | |
| | % of Total | 24.7% | 3.1% | .0% | 2.1% | .0% | .0% | 2.1% | 1.0% | 33.0% | | | |
| Total | Count | 60 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 96 | | | |
| | % within sex | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |
| | % within right coronary | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |

Significance at <0.05

On the other hand the statistical analysis shown significance difference between sex group and sites, severity of lesion in right coronary artery (P <0.001) as shown in the table 5, (36 male was normal, 13 male with focal mid, 3 male with focal distal, 1 male with focal proximal, 1 male with diffuse distal bifurcation, 1 male focal mid RV branch , 7 male diffuse mid, and 2 male total mid), while (24 female was normal, 3 female with focal mid, 0 female with focal distal, 2 female with focal proximal, 0 female with diffuse distal bifurcation, 0 female focal mid RV branch , 2 female diffuse mid, and 1 female total mid).

According to role of the family history in the current study, our results revealed significance difference among family history correlated with coronary dominance ((P <0.001) according to statistical analysis as shown in the table 6, (28 persons with right coronary dominant and 4 persons with left coronary dominant were +ve to family history, while 59 persons with right coronary dominant and 5 persons with left coronary dominant were -ve to family history).

Table 6: shown the relationship between the family history and coronary artery dominance

| Family history | Coronary dominance | | Total | p value | 95% Confidence Interval | | |
|----------------|-----------------------------|--------|--------|---------|-------------------------|---------------|--|
| | Right | Left | | | Lower Bound | Upper Bound | |
| +ve | Count | 28 | 4 | 32 | <0.001 | (0.003-0.006) | |
| | % within family history | 87.5% | 12.5% | 100.0% | | | |
| | % within coronary dominance | 32.2% | 44.4% | 33.0% | | | |
| | % of Total | 28.9% | 4.1% | 33.0% | | | |
| -ve | Count | 59 | 5 | 64 | | | |
| | % within family history | 92.2% | 7.8% | 100.0% | | | |
| | % within coronary dominance | 67.8% | 55.6% | 66.0% | | | |
| | % of Total | 60.8% | 5.2% | 66.0% | | | |
| Total | Count | 87 | 9 | 96 | | | |
| | % within family history | 89.7% | 9.3% | 100.0% | | | |
| | % within coronary dominance | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 89.7% | 9.3% | 100.0% | | | |

Significance at <0.05

Also the statistical interpretation shown strong difference between family history and sites, severity of

lesion in left main stem ($P < 0.001$) as shown in the table 7, (27 persons was normal, 2 persons with focal mid, 2 persons with focal distal, 0 person with focal ostial and 1 person with focal distal bifurcation were +ve to family history, respectively, while 59 persons was normal, 1 person with focal mid, 3 persons with focal distal, 1 person with focal ostial and 0 person with focal distal bifurcation were -ve to family history respectively).

Table 7: shown the relationship between the family history and sites, severity of lesion in left main stem

| Family history | left main stem (LMS) | | | | | Total | p value | 95% Confidence Interval | | |
|----------------|-------------------------|-----------|--------------|--------------|--------------------------|--------|---------|-------------------------|-------------|--------|
| | Normal | Focal mid | Focal distal | Focal ostial | Focal distal bifurcation | | | Lower Bound | Upper Bound | |
| +ve | Count | 27 | 2 | 2 | 0 | 1 | <0.001 | (0.011-0.015) | | |
| | % within family history | 84.4% | 6.3% | 6.3% | .0% | 3.1% | | | | 32 |
| | % within left main stem | 31.4% | 66.7% | 40.0% | .0% | 100.0% | | | | 33.0% |
| | % of Total | 27.8% | 2.1% | 2.1% | .0% | 1.0% | | | | 33.0% |
| -ve | Count | 59 | 1 | 3 | 1 | 0 | | | | 64 |
| | % within family history | 92.2% | 1.6% | 4.7% | 1.6% | .0% | | | | 100.0% |
| | % within left main stem | 68.6% | 33.3% | 60.0% | 100.0% | .0% | | | | 66.0% |
| | % of Total | 60.8% | 1.0% | 3.1% | 1.0% | .0% | | | | 66.0% |
| Total | Count | 86 | 3 | 5 | 1 | 1 | | | | 96 |
| | % within family history | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | | | | 100.0% |
| | % within left main stem | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | | 100.0% |
| | % of Total | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | | | | 100.0% |

Significance at < 0.05

On the other hand the statistical analysis shown significance difference between family history and sites, severity of lesion in left circumflex ($P < 0.001$) as shown in the table 8, (21 persons was normal, 3 persons with focal mid, 3 persons with focal distal, 3 persons with focal proximal, 0 person with diffuse mid bifurcation, 1 person focal proximal rimas intermediate, 1 person diffuse proximal, 0 person total mid and 0 person with total distal were +ve to family history), while (49 persons was normal, 2 persons with focal mid, 6 persons with focal distal, 4 persons with focal proximal, 1 person with diffuse mid bifurcation, 0 person focal proximal rimas intermediate, 0 person diffuse proximal, 1 person total mid and 1 person with total distal were -ve to family history, respectively).

Table 8: shown the relationship between the family history and sites, severity of lesion in left circumflex

| Family history | left circumflex (LCX) | | | | | | | | | | Total | p value | 95% Confidence Interval | | |
|----------------|--------------------------|-----------|--------------|----------------|-------------------------|-----------------------------------|------------------|-----------|--------------|--------|--------|---------|-------------------------|-------------|-------------|
| | Normal | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Focal proximal rimas intermediate | Diffuse proximal | Total mid | Total distal | | | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | | | |
| +ve | Count | 21 | 3 | 3 | 3 | 0 | 1 | 1 | 0 | 0 | 32 | <0.001 | (0.029-0.036) | | |
| | % within family history | 65.6% | 9.4% | 9.4% | 9.4% | .0% | 3.1% | 3.1% | .0% | .0% | 100.0% | | | | |
| | % within left circumflex | 30.0% | 60.0% | 33.3% | 42.9% | .0% | 100.0% | 100.0% | .0% | .0% | 33.0% | | | | |
| | % of Total | 21.6% | 3.1% | 3.1% | 3.1% | .0% | 1.0% | 1.0% | .0% | .0% | 33.0% | | | | |
| -ve | Count | 49 | 2 | 6 | 4 | 1 | 0 | 0 | 1 | 1 | 64 | | | | |
| | % within family history | 76.6% | 3.1% | 9.4% | 6.3% | 1.6% | .0% | .0% | 1.6% | 1.6% | 100.0% | | | | |
| | % within left circumflex | 70.0% | 40.0% | 66.7% | 57.1% | 100.0% | .0% | .0% | 100.0% | 100.0% | 66.0% | | | | |
| | % of Total | 50.5% | 2.1% | 6.2% | 4.1% | 1.0% | .0% | .0% | 1.0% | 1.0% | 66.0% | | | | |
| Total | Count | 70 | 5 | 9 | 7 | 1 | 1 | 1 | 1 | 1 | 96 | | | | |
| | % within family history | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | | |
| | % within left circumflex | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | | |
| | % of Total | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | | |

Significance at <0.05

The statistical analysis shown strong evidence between family history and sites, severity of lesion in left anterior descending (P <0.001) as shown in the table 9, (10 persons was normal, 0 persons with focal ostial, 0 person with diffuse mid long, 0 person with ostial dicanal 1, 1 person with focal proximal dicanal 1, 9 persons with focal mid, 1 persons with focal distal , 2 persons with focal proximal, 0 person with diffuse mid bifurcation, 0 person with total proximal, 4 persons with diffuse proximal, 3 persons with total mid and 2 persons with focal ostial dicanal 1 were +ve to family history), otherwise (24 persons was normal, 1 person with focal ostial, 1 person with diffuse mid long, 1 person with ostial dicanal 1, 2 persons with focal proximal dicanal 1, 14 persons with focal mid, 1 person with focal distal , 6 persons with focal proximal, 2 persons with diffuse mid bifurcation, 2 persons with total proximal, 5 persons with diffuse proximal, 3 persons with total mid and 2 persons with focal ostial dicanal 1 were -ve to family history).

Table 9: shown the relationship between the family history and sites, severity of lesion in left anterior descending

| Family history | (Left anterior descending) LAD | | | | | | | | | | | | | Total | p value | 95% Confidence Interval | |
|-----------------------------------|--------------------------------|--------------|------------------|------------------|--------------------------|-----------|--------------|----------------|-------------------------|----------------|------------------|-----------|------------------------|--------|---------|-------------------------|-------------|
| | Normal | Focal ostial | Diffuse mid long | Ostial dicanal 1 | Focal proximal dicanal 1 | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Total proximal | Diffuse proximal | Total mid | Focal ostial dicanal 1 | | | Lower Bound | Upper Bound |
| +ve Count | 10 | 0 | 0 | 0 | 1 | 9 | 1 | 2 | 0 | 0 | 4 | 3 | 2 | 32 | <0.001 | (0.034-0.042) | |
| % within family history | 31.3% | .0% | .0% | .0% | 3.1% | 28.1% | 3.1% | 6.3% | .0% | .0% | 12.5% | 9.4% | 6.3% | 100.0% | | | |
| % within Left anterior descending | 29.4% | .0% | .0% | .0% | 33.3% | 39.1% | 50.0% | 25.0% | .0% | .0% | 44.4% | 50.0% | 50.0% | 33.0% | | | |
| % of Total | 10.3% | .0% | .0% | .0% | 1.0% | 9.3% | 1.0% | 2.1% | .0% | .0% | 4.1% | 3.1% | 2.1% | 33.0% | | | |
| -ve Count | 24 | 1 | 1 | 1 | 2 | 14 | 1 | 6 | 2 | 2 | 5 | 3 | 2 | 64 | | | |
| % within family history | 37.5% | 1.6% | 1.6% | 1.6% | 3.1% | 21.9% | 1.6% | 9.4% | 3.1% | 3.1% | 7.8% | 4.7% | 3.1% | 100.0% | | | |
| % within Left anterior descending | 70.6% | 100.0% | 100.0% | 100.0% | 66.7% | 60.9% | 50.0% | 75.0% | 100.0% | 100.0% | 55.6% | 50.0% | 50.0% | 66.0% | | | |
| % of Total | 24.7% | 1.0% | 1.0% | 1.0% | 2.1% | 14.4% | 1.0% | 6.2% | 2.1% | 2.1% | 5.2% | 3.1% | 2.1% | 66.0% | | | |
| Total Count | 34 | 1 | 1 | 1 | 3 | 23 | 2 | 8 | 2 | 2 | 9 | 6 | 4 | 96 | | | |
| % within family history | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | |
| % within Left anterior descending | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| % of Total | 35.1% | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 4.1% | 100.0% | | | |

Table 10: shown the relationship between the family history and sites, severity of lesion in right coronary artery

| Family history | | Right coronary artery | | | | | | | | Total | p value | 95% Confidence Interval | |
|----------------|-------------------------|-----------------------|-----------|--------------|----------------|---------------------|----------------------------|-------------|-----------|--------|---------|-------------------------|-------------|
| | | Normal | Focal mid | Focal distal | Focal proximal | Focal mid RV branch | diffuse distal bifurcation | Diffuse mid | Total mid | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | |
| +ve | Count | 21 | 7 | 0 | 1 | 0 | 0 | 3 | 0 | 32 | <0.001 | (0.017-0.022) | |
| | % within family history | 65.6% | 21.9% | .0% | 3.1% | .0% | .0% | 9.4% | .0% | 100.0% | | | |
| | % within right coronary | 35.0% | 43.8% | .0% | 33.3% | .0% | .0% | 33.3% | .0% | 33.0% | | | |
| | % of Total | 21.6% | 7.2% | .0% | 1.0% | .0% | .0% | 3.1% | .0% | 33.0% | | | |
| -ve | Count | 39 | 9 | 3 | 2 | 1 | 1 | 6 | 3 | 64 | <0.001 | (0.017-0.022) | |
| | % within family history | 60.9% | 14.1% | 4.7% | 3.1% | 1.6% | 1.6% | 9.4% | 4.7% | 100.0% | | | |
| | % within right coronary | 65.0% | 56.3% | 100.0% | 66.7% | 100.0% | 100.0% | 66.7% | 100.0% | 66.0% | | | |
| | % of Total | 40.2% | 9.3% | 3.1% | 2.1% | 1.0% | 1.0% | 6.2% | 3.1% | 66.0% | | | |
| Total | Count | 60 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 96 | <0.001 | (0.017-0.022) | |
| | % within family history | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |
| | % within right coronary | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |

Significance at <0.05

On the other hand the statistical analysis shown significance difference between family history and sites, severity of lesion in right coronary artery (P <0.001) as shown in the table 10, (21 persons was normal, 7 persons with focal mid, 0 person with focal distal, 1 person with focal proximal, 0 person with diffuse distal bifurcation, 0 person focal mid RV branch , 3 persons diffuse mid, and 0 person total mid were +ve to family history), while (39 persons was normal, 9 persons with focal mid, 3 persons with focal distal, 2 persons with focal proximal, 1 person with diffuse distal bifurcation, 1 person focal mid RV branch, 6 persons diffuse mid, and 3 persons total mid were -ve to family history).

Table 11: shown the relationship between the coronary dominance and sites, severity of lesion in left main stem

| Coronary dominance | left main stem (LMS) | | | | | Total | p value | 95% Confidence Interval | |
|--------------------|-----------------------------|-----------|--------------|--------------|--------------------------|--------|---------|-------------------------|---------------|
| | Normal | Focal mid | Focal distal | Focal ostial | Focal distal bifurcation | | | Lower Bound | Upper Bound |
| Right | Count | 78 | 2 | 5 | 1 | 1 | 87 | <0.001 | (0.009-0.014) |
| | % within coronary dominance | 89.7% | 2.3% | 5.7% | 1.1% | 1.1% | 100.0% | | |
| | % within left main stem | 90.7% | 66.7% | 100.0% | 100.0% | 100.0% | 89.7% | | |
| | % of Total | 80.4% | 2.1% | 5.2% | 1.0% | 1.0% | 89.7% | | |
| Left | Count | 8 | 1 | 0 | 0 | 0 | 9 | | |
| | % within coronary dominance | 88.9% | 11.1% | .0% | .0% | .0% | 100.0% | | |
| | % within left main stem | 9.3% | 33.3% | .0% | .0% | .0% | 9.3% | | |
| | % of Total | 8.2% | 1.0% | .0% | .0% | .0% | 9.3% | | |
| Total | Count | 86 | 3 | 5 | 1 | 1 | 96 | | |
| | % within coronary dominance | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | 100.0% | | |
| | % within left main stem | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | |
| | % of Total | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | 100.0% | | |

Significance at <0.05

The correlation between coronary dominance and sites, severity of lesion in left main stem, the statistical interpretation shown strong difference ($P < 0.001$) as shown in the table 11, (78 persons was normal, 2 persons with focal mid, 5 persons with focal distal, 1 person with focal ostial and 1 person with focal distal bifurcation were right coronary dominant, respectively, while 8 persons was normal, 1 person with focal mid, 0 person with focal distal, 0 person with focal ostial and 0 person with focal distal bifurcation were left coronary dominant respectively). On the other hand the statistical analysis shown significance difference between coronary dominance and sites, severity of lesion in left circumflex ($P < 0.001$) as shown in the table 12, (63 persons was normal, 5 persons with focal mid, 8 persons with focal distal, 7 persons with focal proximal, 1 person with diffuse mid bifurcation, 1 person focal proximal rimas intermediate, 0 person diffuse proximal, 1 person total mid and 1 person with total distal were right coronary dominant), while (7 persons was normal, 0 person with focal mid, 1 person with focal distal, 0 person with focal proximal, 0 person with diffuse mid bifurcation, 0 person focal proximal rimas intermediate, 1 person diffuse proximal, 0 person total mid and 0 person with total distal were left coronary dominant, respectively).

| Table 12: shown the relationship between the coronary dominance and sites, severity of lesion in left circumflex | | | | | | | | | | | | | | |
|--|-----------------------------|-----------------------|-----------|--------------|----------------|-------------------------|-----------------------------------|------------------|-----------|--------------|--------|---------|-------------------------|-------------|
| Coronary dominance | | left circumflex (LCX) | | | | | | | | | Total | p value | 95% Confidence Interval | |
| | | Normal | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Focal proximal rimas intermediate | Diffuse proximal | Total mid | Total distal | | | Lower Bound | Upper Bound |
| Right | Count | 63 | 5 | 8 | 7 | 1 | 1 | 0 | 1 | 1 | 87 | <0.001 | (0.021-0.027) | |
| | % within coronary dominance | 72.4% | 5.7% | 9.2% | 8.0% | 1.1% | 1.1% | .0% | 1.1% | 1.1% | 100.0% | | | |
| | % within left circumflex | 90.0% | 100.0% | 88.9% | 100.0% | 100.0% | 100.0% | .0% | 100.0% | 100.0% | 89.7% | | | |
| | % of Total | 64.9% | 5.2% | 8.2% | 7.2% | 1.0% | 1.0% | .0% | 1.0% | 1.0% | 89.7% | | | |
| Left | Count | 7 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 9 | <0.001 | (0.021-0.027) | |
| | % within coronary dominance | 77.8% | .0% | 11.1% | .0% | .0% | .0% | 11.1% | .0% | .0% | 100.0% | | | |
| | % within left circumflex | 10.0% | .0% | 11.1% | .0% | .0% | .0% | 100.0% | .0% | .0% | 9.3% | | | |
| | % of Total | 7.2% | .0% | 1.0% | .0% | .0% | .0% | 1.0% | .0% | .0% | 9.3% | | | |
| Total | Count | 70 | 5 | 9 | 7 | 1 | 1 | 1 | 1 | 1 | 96 | <0.001 | (0.021-0.027) | |
| | % within coronary dominance | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |
| | % within left circumflex | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |

Significance at <0.05

The statistical analysis shown strong evidence between coronary dominance and sites, severity of lesion in left anterior descending (P <0.001) as shown in the table 13, (31 persons was normal, 0 persons with focal ostial, 1 person with diffuse mid long, 1 person with ostial dicanal 1, 2 persons with focal proximal dicanal 1, 21 persons with focal mid, 28 persons with focal distal , 2 persons with focal proximal, 2 persons with diffuse mid bifurcation, 2 persons with total proximal, 7 persons with diffuse proximal, 6 persons with total mid and 4 persons with focal ostial dicanal 1 were right coronary dominant), otherwise (3 persons was normal, 1 persons with focal ostial, 0 person with diffuse mid long, 0 person with ostial dicanal 1, 1 persons with focal proximal dicanal 1, 2 persons with focal mid, 0 persons with focal distal , 0 persons with focal proximal, 0 persons with diffuse mid bifurcation, 0 persons with total proximal, 2 persons with diffuse proximal, 0 persons with total mid and 0 persons with focal ostial dicanal 1 were left coronary dominant).

Table 14: shown the relationship between the coronary dominance and sites, severity of lesion in right coronary artery

| Coronary dominance | Right coronary artery | | | | | | | | Total | p value | 95% Confidence Interval | |
|-----------------------------|-----------------------|-----------|--------------|----------------|---------------------|----------------------------|-------------|-----------|--------|---------|-------------------------|-------------|
| | Normal | Focal mid | Focal distal | Focal proximal | Focal mid RV branch | diffuse distal bifurcation | Diffuse mid | Total mid | | | Lower Bound | Upper Bound |
| | Right Count | 51 | 16 | 3 | 3 | 1 | 1 | 9 | | | 3 | 87 |
| % within coronary dominance | 58.6% | 18.4% | 3.4% | 3.4% | 1.1% | 1.1% | 10.3% | 3.4% | 100.0% | | | |
| % within right coronary | 85.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 89.7% | | | |
| % of Total | 52.6% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 89.7% | | | |
| Left Count | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | | | |
| % within coronary dominance | 100.0% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 100.0% | | | |
| % within right coronary | 15.0% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 9.3% | | | |
| % of Total | 9.3% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 9.3% | | | |
| Total Count | 60 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 96 | | | |
| % within coronary dominance | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |
| % within right coronary | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| % of Total | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |

Table 13: shown the relationship between the coronary dominance and sites, severity of lesion in left anterior descending

| Coronary dominance | | (Left anterior descending) LAD | | | | | | | | | | | | | Total | p value | 95% Confidence Interval | | |
|--------------------|-----------------------------------|--------------------------------|--------------|------------------|------------------|--------------------------|-----------|--------------|----------------|-------------------------|----------------|------------------|-----------|------------------------|--------|---------|-------------------------|-------------|-------------|
| | | Normal | Focal ostial | Diffuse mid long | Ostial dicanal l | Focal proximal dicanal l | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Total proximal | Diffuse proximal | Total mid | Focal ostial dicanal l | | | Total | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | | | | | | | |
| Right | Count | 31 | 0 | 1 | 1 | 2 | 21 | 2 | 8 | 2 | 2 | 7 | 6 | 4 | 87 | <0.001 | (0.007-0.011) | | |
| | % within coronary dominance | 35.6% | .0% | 1.1% | 1.1% | 2.3% | 24.1% | 2.3% | 9.2% | 2.3% | 2.3% | 8.0% | 6.9% | 4.6% | 100.0% | | | | |
| | % within Left anterior descending | 91.2% | .0% | 100.0% | 100.0% | 66.7% | 91.3% | 100.0% | 100.0% | 100.0% | 77.8% | 100.0% | 100.0% | 89.7% | | | | | |
| | % of Total | 32.0% | .0% | 1.0% | 1.0% | 2.1% | 21.6% | 2.1% | 8.2% | 2.1% | 7.2% | 6.2% | 4.1% | 89.7% | | | | | |
| Left | Count | 3 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 9 | | | | |
| | % within coronary dominance | 33.3% | 11.1% | .0% | .0% | 11.1% | 22.2% | .0% | .0% | .0% | 22.2% | .0% | .0% | 100.0% | | | | | |
| | % within Left anterior descending | 8.8% | 100.0% | .0% | .0% | 33.3% | 8.7% | .0% | .0% | .0% | 22.2% | .0% | .0% | 9.3% | | | | | |
| | % of Total | 3.1% | 1.0% | .0% | .0% | 1.0% | 2.1% | .0% | .0% | .0% | 2.1% | .0% | .0% | 9.3% | | | | | |
| Total | Count | 34 | 1 | 1 | 1 | 3 | 23 | 2 | 8 | 2 | 2 | 9 | 6 | 4 | 96 | | | | |
| | % within coronary dominance | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | | |
| | % within Left anterior descending | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | | | |
| | % of Total | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | | |

Significance at <0.05

Table 14: shown the relationship between the coronary dominance and sites, severity of lesion in right coronary artery

| Coronary dominance | | Right coronary artery | | | | | | | | | Total | p value | 95% Confidence Interval | |
|--------------------|-----------------------------|-----------------------|-----------|--------------|----------------|---------------------|----------------------------|-------------|-----------|--------|--------|---------------|-------------------------|-------------|
| | | Normal | Focal mid | Focal distal | Focal proximal | Focal mid RV branch | diffuse distal bifurcation | Diffuse mid | Total mid | Total | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | | |
| Right | Count | 51 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 87 | <0.001 | (0.009-0.013) | | |
| | % within coronary dominance | 58.6% | 18.4% | 3.4% | 3.4% | 1.1% | 1.1% | 10.3% | 3.4% | 100.0% | | | | |
| | % within right coronary | 85.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 89.7% | | | | |
| | % of Total | 52.6% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 89.7% | | | | |
| Left | Count | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | | | | |
| | % within coronary dominance | 100.0% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 100.0% | | | | |
| | % within right coronary | 15.0% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 9.3% | | | | |
| | % of Total | 9.3% | .0% | .0% | .0% | .0% | .0% | .0% | .0% | 9.3% | | | | |
| Total | Count | 60 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 96 | | | | |
| | % within coronary dominance | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | | |
| | % within right coronary | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | | |
| | % of Total | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | | |

Significance at <0.05

On the other hand the statistical analysis shown significance difference between coronary dominance and sites, severity of lesion in right coronary artery ($P < 0.001$) as shown in the table 14, (51 persons was normal, 16 persons with focal mid, 3 persons with focal distal, 3 persons with focal proximal, 1 person with diffuse distal bifurcation, 1 person focal mid RV branch , 9 persons diffuse mid, and 3 person total were right coronary dominant), while (9 persons was normal, 0 person with focal mid, 0 person with focal distal, 0 person with focal proximal, 0 person with diffuse distal bifurcation, 0 person focal mid RV branch, 0 person diffuse mid, and 0 person total mid were left coronary dominant).

Our results revealed significance difference among handedness correlated with coronary dominance (($P < 0.001$) according to statistical analysis as shown in the table 15, (84 persons with right coronary dominant were right handed and 8 persons with left coronary dominant were right handed, while 3 persons with right coronary dominant were left handed and 1 person with left coronary dominant were left handed).

Table 15: shown the relationship between the handedness and coronary artery dominance

| Handedness | Coronary dominance | | Total | p value | 95% Confidence Interval | |
|------------|-----------------------------|--------|--------|---------|-------------------------|---------------|
| | Right | Left | | | Lower Bound | Upper Bound |
| Right | Count | 84 | 8 | 92 | <0.001 | (0.001-0.003) |
| | % within handedness | 91.3% | 8.7% | 100.0% | | |
| | % within coronary dominance | 96.6% | 88.9% | 94.8% | | |
| | % of Total | 86.6% | 8.2% | 94.8% | | |
| Left | Count | 3 | 1 | 4 | | |
| | % within handedness | 75.0% | 25.0% | 100.0% | | |
| | % within coronary dominance | 3.4% | 11.1% | 4.1% | | |
| | % of Total | 3.1% | 1.0% | 4.1% | | |
| Total | Count | 87 | 9 | 96 | | |
| | % within handedness | 89.7% | 9.3% | 100.0% | | |
| | % within handedness | 100.0% | 100.0% | 100.0% | | |
| | % of Total | 89.7% | 9.3% | 100.0% | | |

Significance at < 0.05

The correlation between handedness and sites, severity of lesion in left main stem, the statistical interpretation shown strong difference ($P < 0.001$) as shown in the table 16, (84 persons was normal, 2 persons with focal mid, 4 persons with focal distal, 1 person with focal ostial and 1 person with focal distal bifurcation were right handed, respectively, while 2 persons was normal, 1 person with focal mid, 1 person with focal distal, 0 person with focal ostial and 0 person with focal distal bifurcation were left handed respectively).

Table 16: shown the relationship between the handedness and sites, severity of lesion in left main stem

| Handedness | left main stem (LMS) | | | | | Total | p value | 95% Confidence Interval | |
|-------------------------|----------------------|-----------|--------------|--------------|--------------------------|--------|---------|-------------------------|-------------|
| | Normal | Focal mid | Focal distal | Focal ostial | Focal distal bifurcation | | | Lower Bound | Upper Bound |
| Right Count | 84 | 2 | 4 | 1 | 1 | 92 | <0.001 | (0.004 | 002-0. |
| % within handedness | 91.3% | 2.2% | 4.3% | 1.1% | 1.1% | 100.0% | | | |
| % within left main stem | 97.7% | 66.7% | 80.0% | 100.0% | 100.0% | 94.8% | | | |
| % of Total | 86.6% | 2.1% | 4.1% | 1.0% | 1.0% | 94.8% | | | |
| Left Count | 2 | 1 | 1 | 0 | 0 | 4 | | | |
| % within handedness | 50.0% | 25.0% | 25.0% | .0% | .0% | 100.0% | | | |
| % within left main stem | 2.3% | 33.3% | 20.0% | .0% | .0% | 4.1% | | | |
| % of Total | 2.1% | 1.0% | 1.0% | .0% | .0% | 4.1% | | | |
| Total Count | 86 | 3 | 5 | 1 | 1 | 96 | | | |
| % within handedness | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | 100.0% | | | |
| % within left main stem | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| % of Total | 88.7% | 3.1% | 5.2% | 1.0% | 1.0% | 100.0% | | | |

Significance at <0.05

On the other hand the statistical analysis shown significance difference handedness and sites, severity of lesion in left circumflex ($P < 0.001$) as shown in the table 17, (70 persons was normal, 5 persons with focal mid, 8 persons with focal distal, 5 persons with focal proximal, 1 person with diffuse mid bifurcation, 1 person focal proximal rimas intermediate, 0 person diffuse proximal, 1 person total mid and 1 person with total distal were right handed), while (0 person was normal, 0 person with focal mid, 1 person with focal distal, 2 persons with focal proximal, 0 person with diffuse mid bifurcation, 0 person focal proximal rimas intermediate, 1 person diffuse proximal, 0 person total mid and 0 person with total distal were left handed).

Table 17: shown the relationship between the handedness and sites, severity of lesion in left circumflex

| Handedness | left circumflex (LCX) | | | | | | | | | | Total | p value | 95% Confidence Interval | |
|------------|--------------------------|-----------|--------------|----------------|-------------------------|----------------------------------|------------------|-----------|--------------|--------|--------|---------|-------------------------|-------------|
| | Normal | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Focal proximal rimas intermedate | Diffuse proximal | Total mid | Total distal | | | | Lower Bound | Upper Bound |
| | | | | | | | | | | | | | | |
| Right | Count | 70 | 5 | 8 | 5 | 1 | 1 | 0 | 1 | 1 | 92 | <0.001 | (0.001-0.002) | |
| | % within handedness | 76.1% | 5.4% | 8.7% | 5.4% | 1.1% | 1.1% | .0% | 1.1% | 1.1% | 100.0% | | | |
| | % within left circumflex | 100.0% | 100.0% | 88.9% | 71.4% | 100.0% | 100.0% | .0% | 100.0% | 100.0% | 94.8% | | | |
| | % of Total | 72.2% | 5.2% | 8.2% | 5.2% | 1.0% | 1.0% | .0% | 1.0% | 1.0% | 94.8% | | | |
| Left | Count | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 4 | | | |
| | % within handedness | .0% | .0% | 25.0% | 50.0% | .0% | .0% | 25.0% | .0% | .0% | 100.0% | | | |
| | % within left circumflex | .0% | .0% | 11.1% | 28.6% | .0% | .0% | 100.0% | .0% | .0% | 4.1% | | | |
| | % of Total | .0% | .0% | 1.0% | 2.1% | .0% | .0% | 1.0% | .0% | .0% | 4.1% | | | |
| Total | Count | 70 | 5 | 9 | 7 | 1 | 1 | 1 | 1 | 1 | 96 | | | |
| | % within handedness | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |
| | % within left circumflex | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 72.2% | 5.2% | 9.3% | 7.2% | 1.0% | 1.0% | 1.0% | 1.0% | 1.0% | 100.0% | | | |

Significance at <0.05

Table 18: shown the relationship between the handedness and sites, severity of lesion in left anterior descending

| Handedness | (Left anterior descending) LAD | | | | | | | | | | | | | | Total | p value | 95% Confidence Interval | |
|------------|-----------------------------------|--------------|------------------|------------------|--------------------------|-----------|--------------|----------------|-------------------------|----------------|------------------|-----------|------------------------|-------------|--------|---------|-------------------------|--|
| | Normal | Focal ostial | Diffuse mid long | Ostial dicanal 1 | Focal proximal dicanal 1 | Focal mid | Focal distal | Focal proximal | Diffuse mid bifurcation | Total proximal | Diffuse proximal | Total mid | Focal ostial dicanal 1 | Lower Bound | | | Upper Bound | |
| Right | Count | 33 | 1 | 1 | 1 | 3 | 22 | 1 | 8 | 2 | 2 | 8 | 6 | 4 | 92 | <0.001 | (0.012-0.016) | |
| | % within handedness | 35.9% | 1.1% | 1.1% | 1.1% | 3.3% | 23.9% | 1.1% | 8.7% | 2.2% | 2.2% | 8.7% | 6.5% | 4.3% | 100.0% | | | |
| | % within Left anterior descending | 97.1% | 100.0% | 100.0% | 100.0% | 100.0% | 95.7% | 50.0% | 100.0% | 100.0% | 100.0% | 88.9% | 100.0% | 100.0% | 94.8% | | | |
| | % of Total | 34.0% | 1.0% | 1.0% | 1.0% | 3.1% | 22.7% | 1.0% | 8.2% | 2.1% | 2.1% | 8.2% | 6.2% | 4.1% | 94.8% | | | |
| Left | Count | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | | | |
| | % within handedness | 25.0% | .0% | .0% | .0% | .0% | 25.0% | 25.0% | .0% | .0% | .0% | 25.0% | .0% | .0% | 100.0% | | | |
| | % within Left anterior descending | 2.9% | .0% | .0% | .0% | .0% | 4.3% | 50.0% | .0% | .0% | .0% | 11.1% | .0% | .0% | 4.1% | | | |
| | % of Total | 1.0% | .0% | .0% | .0% | .0% | 1.0% | 1.0% | .0% | .0% | 1.0% | .0% | .0% | .0% | 4.1% | | | |
| Total | Count | 34 | 1 | 1 | 1 | 3 | 23 | 2 | 8 | 2 | 2 | 9 | 6 | 4 | 96 | | | |
| | % within handedness | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | |
| | % within Left anterior descending | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 35.1% | 1.0% | 1.0% | 1.0% | 3.1% | 23.7% | 2.1% | 8.2% | 2.1% | 2.1% | 9.3% | 6.2% | 4.1% | 100.0% | | | |

Significance at <0.05

The statistical analysis shown strong evidence between handedness and sites, severity of lesion in left anterior descending (P <0.001) as shown in the table 18, (33 persons was normal, 1 persons with focal ostial, 1 person with diffuse mid long, 1 person with ostial dicanal 1, 3 persons with focal proximal dicanal 1, 22 persons with focal mid, 1 persons with focal distal , 8 persons with focal proximal, 2 persons with diffuse mid bifurcation, 2 persons with total proximal, 8 persons with diffuse proximal, 6 persons with total mid and 4 persons with focal ostial dicanal 1 were right coronary dominant), otherwise (1 persons was normal, 0 persons with focal ostial, 0 person with diffuse mid long, 0 person with ostial dicanal 1, 0 persons with focal proximal dicanal 1, 1 persons with focal mid, 1 persons with focal distal , 0 persons with focal proximal, 0 persons with diffuse mid bifurcation, 0 persons with total proximal, 1 persons with diffuse proximal, 0 persons with total mid and 0 persons with focal ostial dicanal 1 were left coronary dominant).

Table 19: shown the relationship between the handedness and sites, severity of lesion in right coronary artery

| Handedness | | Right coronary artery | | | | | | | | Total | p value | 95% Confidence Interval | |
|------------|-------------------------|-----------------------|-----------|--------------|----------------|---------------------|----------------------------|-------------|-----------|--------|---------|-------------------------|-------------|
| | | Normal | Focal mid | Focal distal | Focal proximal | Focal mid RV branch | diffuse distal bifurcation | Diffuse mid | Total mid | | | Lower Bound | Upper Bound |
| | | Right | Count | 57 | 15 | 3 | 3 | 1 | 1 | | | 9 | 3 |
| | % within handedness | 62.0% | 16.3% | 3.3% | 3.3% | 1.1% | 1.1% | 9.8% | 3.3% | 100.0% | | | |
| | % within right coronary | 95.0% | 93.8% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 94.8% | | | |
| | % of Total | 58.8% | 15.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 94.8% | | | |
| Left | Count | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | | | |
| | % within handedness | 75.0% | 25.0% | .0% | .0% | .0% | .0% | .0% | .0% | 100.0% | | | |
| | % within right coronary | 5.0% | 6.3% | .0% | .0% | .0% | .0% | .0% | .0% | 4.1% | | | |
| | % of Total | 3.1% | 1.0% | .0% | .0% | .0% | .0% | .0% | .0% | 4.1% | | | |
| Total | Count | 60 | 16 | 3 | 3 | 1 | 1 | 9 | 3 | 96 | | | |
| | % within handedness | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |
| | % within right coronary | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | | | |
| | % of Total | 61.9% | 16.5% | 3.1% | 3.1% | 1.0% | 1.0% | 9.3% | 3.1% | 100.0% | | | |

Significance at <0.05

On the other hand the statistical analysis shown significance difference between coronary dominance and sites, severity of lesion in right coronary artery ($P < 0.001$) as shown in the table 14, (57 persons was normal, 15 persons with focal mid, 3 persons with focal distal, 3 persons with focal proximal, 1 person with diffuse distal bifurcation, 1 person focal mid RV branch, 9 persons diffuse mid, and 3 person total were right coronary dominant), while (3 persons was normal, 1 person with focal mid, 0 person with focal distal, 0 person with focal proximal, 0 person with diffuse distal bifurcation, 0 person focal mid RV branch, 0 person diffuse mid, and 0 person total mid were left coronary dominant).

DISCUSSION

As we mentioned previously, the coronary dominance play important role in cardiac diseases. Also the relationship between coronary dominance and handedness not mention previously, therefor we focused on this point to discuss it. In correlation between sex groups and coronary dominance, our finding suggested that, the sex have-not role in coronary dominance, otherwise, Zorin Makarovic et al. suggested that left dominance (particularly in women) and the absence of a mixed supply in men could cause regional ischemia, thus affecting the development of non-obstructive CAD. Furthermore, sex may determine the incidence of specific coronary artery supply types, therefore influencing disease development and prognosis (MAKAROVIC *et al.* 2014). Also according to our results the correlations between the types, severity of lesions in right coronary artery, left circumflex, left main stem and sex group, we suggest there is no evidence between them, while we suggested maybe there is an association between the left anterior descending lesion and sex, we think the males more predisposed to suffering from focal mid lesion in the left anterior descending more than female. According to the coronary dominance, left circumflex, left main stem, right coronary artery and left anterior descending lesion correlated with sex group we suggested there are no association between recent parameters. Family history of coronary heart disease (CHD) is a well-recognized risk factor, with multiple prospective studies demonstrating a consistent, independent association with CHD (ANDRESDOTTIR *et al.* 2002; LLOYD-JONES *et al.* 2004; MARENBERG *et al.* 1994). Otherwise the role coronary dominance in severity, lesions of left circumflex and left main stem still un clear in our study, but we suggest the patients with right coronary dominance may be susceptible to suffering from focal mid lesion in left anterior descending and right coronary artery. Samad Ghaffari, et al. revealed that left coronary dominance was not associated with atherosclerotic involvement of LAD ostium and ischemic MR (GHAFFARI *et al.* 2013). On the other hand, the recent study revealed that the Left and codominance are associated with modestly increased post-percutaneous coronary intervention in-hospital mortality in patients with acute coronary syndrome. Confirmation of these findings with angiographic core laboratory verification of coronary dominance and longer term follow-up will be desirable (PARIKH *et al.* 2012). The important aspect in our study the study of handedness associated with coronary dominance, the handedness mentioned and involved in more than one study but in other aspect (SZAFLARSKI *et al.* 2012). So our study was

designed depending our notices during the coronary angiography and the using of hand right/left. Our novel finding that's, the patients using the right hand usually presented with right coronary dominance and the patients using the left hand usually presented with left coronary dominance, also we think there is an association between the patients using right handed and severity, lesions of left anterior descending and right coronary artery, otherwise we suggest there is no relation between handedness and severity, lesions of left circumflex and left main stem.

In conclusion, via our finding the handedness play important role whereas the patients using right hand usually will be right coronary dominance and the patients using right hand maybe suffering from focal mid lesion in lesions of left anterior descending and right coronary artery, also we expect the male more suffering than female for focal mid lesion in left anterior descending and the patients with right coronary dominance maybe suffering from focal mid lesion in lesions of left anterior descending and right coronary artery.

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