

Comparing the Risk Factors of Atherosclerosis in Patients Suffering from X Syndrome and Comparing it Against the Normal Population

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<http://dx.doi.org/10.13005/bbra/2301>

(Received: 22 July 2016; accepted: 01 September 2016)

X syndrome is a cardiovascular disease during which the patient suffers from chest cage pains. There is currently no certain method to treat this disease. The treatments which are usually applied now use nitrogen compounds, calcium channel blockers, heart afterload reducers and beta blockers. However, these strategies have failed to have a significant influence on improving and treating this disease. Factors of atherosclerosis and control of these factors can have a significant impact on the treatment of syndrome X. However, determining the share and influence of each factor, their measurement and comparing them against normal population is quite necessary. This research conducted for the first time studies the effect of atherosclerosis factors such as hyperlipidemia, diabetes, high blood pressure, obesity, smoking cigarettes, long stress and family record of cardiovascular diseases among those suffering from X syndrome separately and, finally, we compare these factors with normal population. Having resorted to the heart unit of Tehran's Dey Hospital, as many as 4000 files corresponding to the patients who had undergone angiography there were studied. As many as 160 files of patients suffering from X syndrome were obtained and the information corresponding to each variable was extracted and registered in the special form prepared for this purpose. The EF of each atherosclerosis factor was analyzed compared to its negative counterpart. Then each factor was measured and compared against the normal population using SPSS and Pearson chi square test. EF was considered as a variable representing the intensity of disease and the level of functioning disruption. Then, other risk factors were compared against it. Gender, diabetes, hyperlipidemia, smoking, obesity and high blood pressure had no significant correlation with the level of EF of patients. However, there was a statistically significant correlation between long-term stress and EF and the level of EF in the group with positive long-term stress was significantly less than what was observed in negative stress group. Considering the ODDS Ratio calculated, obesity with an ODDS Ratio of 6.711 has the greatest correlation with X syndrome and it has the highest preference for future interventional studies on the effect of treating risk factors on reducing the symptoms of those patients suffering from X syndrome. obesity possesses the greatest preference for interventional studies in order to study the influence of treating risk factors of atherosclerosis on reducing the symptoms and enhancing the recovery of disease in patients suffering from heart X syndrome.

Keywords: X Syndrome, Cardiovascular Disease, Obesity, Atherosclerosis Factors, Heart Disease.

X syndrome is a cardiovascular disease during which the patient suffers from chest cage

pains. Their fitness test might be unnatural and the angiography of most of them is normal or close to normal. Various studies point to the fact that controlling factors make a great contribution to controlling this disease¹. As the researches

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indicate, there is currently no certain method to treat this disease. The treatments which are usually applied now use nitrogen compounds, calcium channel blockers, heart afterload reducers and beta blockers²⁻⁴. However, these strategies have failed to have a significant influence on improving and treating this disease.

Various researches conducted on patients suffering from X syndrome point to the fact that atherosclerosis factors and controlling them can have a major influence on treating it. Various references also point to the useful effect of controlling risk factors of atherosclerosis, but the effectiveness of each one and the main factors for controlling it are not specified yet^{1,5}.

In a research conducted on 142 patients whose fitness tests were positive and their angiographies were natural, the following results were achieved for heart risk factors: 45.7% for blood pressure, 33.8% for dyslipidemia, 19.7% for obesity, 18.3% for positive family history of coronary vessels, and 16.1% for smoking cigarettes¹.

In another research, 17 patients suffering from X syndrome underwent angiography after 9 years. 15 of them showed no symptoms or signs of vascular occlusion and this fact points to no increase of atherosclerosis risk factors in these patients compared to the normal population⁶.

Different studies conducted on those suffering from X syndrome points to the fact that daily and regular exercising as well as physical activities can reduce heart pains in these patients⁷.

However, determining the share and influence of each factor, their measurement and comparing them against normal population is quite necessary.

This research conducted for the first time studies the effect of atherosclerosis factors such as hyperlipidemia, diabetes, high blood pressure, obesity, smoking cigarettes, long stress and family record of cardiovascular diseases among those suffering from X syndrome separately and, finally, we compare these factors with normal population.

MATERIAL AND METHOD

Population and sampling methods

Having resorted to the heart unit of Tehran's Dey Hospital, as many as 4000 files corresponding to the patients who had undergone

angiography there were studied. As many as 160 files of patients suffering from X syndrome were obtained and the information corresponding to each variable was extracted and registered in the special form prepared for this purpose.

Patients with positive fitness test, positive heart scan or positive echo stress were included in our research and patients with obstruction in two or three coronary veins were excluded and those patients whose angiography results were normal or close to normal were included in the research.

Variables and the method of studying them

Variables such as age, gender, sweet diabetes, hyperlipidemia, high blood pressure, obesity, smoking cigarettes, long-term stress and positive family history were studied in this research. They were then categorized in terms of the type of variable, role of variable, scientific definition and unit of measurement. Table 1 shows the type of variables, the role of each one, scientific definition and measurement unit of each one.

In this research, the EF of each atherosclerosis factor was analyzed compared to its negative counterpart. Then each factor was measured and compared against the normal population using SPSS and Pearson chi square test.

RESULTS

Gender

In studying the effect of gender on the EF (Ejection fraction) of patients, the EF variable was compared across male and female groups. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 1.57 with the mean EF for males and females being 53.48 and 55.05 respectively. This difference with a P-value of 0.119 and an alpha value of 0.05 was not statistically significant.

Long-term stress

In studying the effect of long-term stress on the EF of patients, the EF variable was compared across positive and negative long-term stress groups. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 1.39 with

the mean EF for people with negative and positive stress being 55.4 and 54.01 respectively. This difference with a P-value of 1.011 and an alpha value of 0.05 was statistically significant.

Diabetes

In studying the effect of diabetes on the EF of patients, the EF variable was compared across positive and negative diabetes groups. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 0.82 with the mean EF for people with negative and positive diabetes being 54.16 and 54.98 respectively. This difference with a P-value of 0.38 and an alpha value of 0.05 was not statistically significant.

Hyperlipidemia

In studying the effect of hyperlipidemia on the EF of patients, the EF variable was compared across positive and negative hyperlipidemia groups. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 0.67 with the mean EF for people with negative and positive hyperlipidemia being 54.09 and 54.76 respectively. This difference with a P-value of 0.489 and an alpha value of 0.05 was not statistically significant.

Smoking cigarettes

In studying the effect of smoking cigarettes on the EF of patients, the EF variable was compared across the groups of smokers and non-smokers. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 0.72 with the mean EF for non-smokers and smokers being 54.19 and 54.91 respectively. This difference with a P-value of 0.879 and an alpha value of 0.05 was not statistically significant.

Family history

In studying the effect of family history on the EF of patients, the EF variable was compared across positive and negative family history groups. Due to the abnormal distribution of EF in both groups, independent samples Mann-Whitney U test was used for them. The difference observed between the two groups in this test was 0.57 with the mean EF for people with negative and positive family histories being 53.86 and 54.43 respectively.

This difference with a P-value of 0.179 and an alpha value of 0.05 was not statistically significant.

Comparing the correlation between X syndrome and atherosclerosis factors

Diabetes

Pearson chi square test was utilized to study the correlation between mellitus diabetes and heart X syndrome. The following results were obtained among the participants: 132 people with negative diabetes and positive X syndrome, 28 people with positive diabetes and positive X syndrome, 9452 people with negative diabetes and negative X syndrome, and 1116 people with positive diabetes and negative X syndrome. Chi statistics for these two variables was 7.968. With a freedom degree of 1 and a P-value of 0.005 and an alpha value of 0.05, it was statistically significant.

Hyperlipidemia

In order to study this variable the following groups were selected: 98 with negative hyperlipidemia and positive X syndrome, 62 with positive hyperlipidemia and positive X syndrome, 7513 with negative hyperlipidemia and negative X syndrome, and 3055 with positive hyperlipidemia and negative X syndrome. Chi statistics for these two variables was 7.106. With a freedom degree of 1 and a P-value of 0.008 and an alpha value of 0.05, it was statistically significant.

Obesity

In this research, the following results were achieved concerning obesity: 62 with negative obesity and positive X syndrome, 98 with positive obesity and positive X syndrome, 8114 with negative obesity and negative X syndrome, and 2454 with positive obesity and negative X syndrome. Chi statistics for these two variables was 114.312. With a freedom degree of 1 and a P-value of 0.000, it was statistically significant.

Smoking cigarettes

In this research, the following results were achieved concerning smoking cigarettes: 124 non-smokers with positive X syndrome, 36 smokers with positive X syndrome, 9458 non-smokers with negative X syndrome, and 1110 smokers with negative X syndrome. Chi statistics for these two variables was 12.985. With a freedom degree of 1 and a P-value of 0.000, it was statistically significant.

Blood pressure

In this research, the following results were

achieved concerning blood pressure: 90 with negative blood pressure and positive X syndrome, 70 with positive blood pressure and positive X syndrome, 8122 with negative blood pressure and negative X syndrome, and 2446 with positive blood pressure and negative X syndrome. Chi statistics for these two variables was 37.274. With a freedom degree of 1 and a P-value of 0.000, it was statistically significant.

DISCUSSION

X syndrome is a cardiovascular disease during which the patient suffers from chest cage pains. Their fitness test might be unnatural and the angiography of most of them is normal or close to normal. Various studies point to the fact that controlling factors make a great contribution to controlling this disease.

In a research conducted by Kaski *et al* (1995), it turned out that the plasma levels of endothelin in patients suffering from X syndrome is significantly higher. This fact points to the failure of endothelium in these patients. We may also arrive at the conclusion that any pain in chest cage can be caused by high levels of endothelin in blood plasma⁸.

In the researches conducted by Lanza *et al* (1997), it turned out that a high percentage of X syndrome patients show disruption in performance of Adrenergic nerves⁹.

In another study conducted by Likelten *et al* (1995), 176 patients suffering from X syndrome were followed and monitored for 5 to 15 years. Their death toll caused by cardiovascular incidents was natural and similar to normal population. The risk of cardiovascular incidents among those patients with more risk factors had increased⁵.

In another research conducted by Pit *et al* (1997), it was demonstrated that 17 patients suffering from X syndrome underwent angiography after 9 years and 15 cases showed no signs of obstruction. This fact was indicative of good survival and no rise of Atherosclerosis risk in these patients compared to normal population⁶.

In this research, 160 of the patients resorting to the heart unit of 502 Hospital of the Army were studied in terms of age, gender, sweet diabetes, Hyperlipidemia, high blood pressure, obesity, smoking cigarette, long stresses and

positive family history and their correlation with X syndrome disease.

Among various factors studied among patients, EF was considered as a variable representing the intensity of disease and the level of functioning disruption. Then, other risk factors were compared against it. Gender, diabetes, hyperlipidemia, smoking, obesity and high blood pressure had no significant correlation with the level of EF of patients. However, there was a statistically significant correlation between long-term stress and EF and the level of EF in the group with positive long-term stress was significantly less than what was observed in negative stress group. Thus, heart functioning in the positive long-term stress group was more than what was observed in negative stress group.

There was a significant correlation between mellitus diabetes, hyperlipidemia, obesity, smoking, and high blood pressure with X syndrome. A Cohort study is required to determine which one is the risk factor of the other.

Considering the ODDS Ratio calculated, obesity with an ODDS Ratio of 6.711 has the greatest correlation with X syndrome and it has the highest preference for future interventional studies on the effect of treating risk factors on reducing the symptoms of those patients suffering from X syndrome. Following it, factors such as high blood pressure with an ODDS ratio of 2.583, smoking cigarette with an ODDS ratio of 2.092, diabetes with an ODDS ratio of 1.795 and Hyperlipidemia with an ODDS ratio of 1.545 had the greatest correlation with heart X syndrome.

Based on this study, obesity possesses the greatest preference for interventional studies in order to study the influence of treating risk factors of atherosclerosis on reducing the symptoms and enhancing the recovery of disease in patients suffering from heart X syndrome.

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