

RISK FACTORS OF ACUTE CORONARY SYNDROME IN YOUNG AGED PEOPLE IN SULAIMANI

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ABSTRACT

Background

Acute coronary syndrome is relatively rare in young aged people, but it is a serious condition which may cause many complications including sudden cardiac death.

Objectives

To assess the risk factors of ACS in those less than 45 years old.

Patients and Methods

This is a retrospective study that observed risk factor profiles of 40 cases of ACS who are younger than 45 years old and admitted to coronary care unit in Sulaimani.

Results

The mean age was 40.9 years old. Male to female ratio was 4.7:1 and 75% of the cases were ST elevation myocardial infarction (STEMI), the other 25% of the cases were non ST elevation myocardial infarction (NSTEMI) and unstable angina (UA). The most associated risk factor was smoking, in which 55% of the cases were smokers, while 40% of the cases were diabetics. There was hypercholesterolemia in 37% of the cases, and 32.5% of the cases had family history of ACS.

Conclusion

In this study we found that male sex, smoking, dyslipidemia, and presence of family history are the most associated risk factors for developing ACS in young aged groups.

Keywords: *Acute coronary syndrome, ST elevation myocardial infarctions, Non STEMI, Unstable angina.*

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INTRODUCTION

ACS refers to any group of clinical symptoms compatible with acute myocardial ischemia and includes ST-segment elevation myocardial infarction, non ST-segment elevation myocardial infarction and unstable angina ⁽¹⁾. ACS is the primary cause of hospital admission and mortality in the world ⁽²⁾. Although ACS in young aged people constitutes only 6–10% of all cases, but it has grave medical, social, and psychological consequences in this age group. Sudden cardiac death which is the most sever complication of ACS occurs also in young aged people ⁽³⁾. Approximately 12%of cases will die within one month ⁽⁴⁾. There are many common cardiovascular risk factors in young aged people nowadays, such as smoking, obesity, diabetes, dyslipidemia, and emotional stress that lead to premature coronary atherosclerosis ⁽⁵⁾. Family history of premature coronary artery disease significantly increases the risk of ACS ⁽⁶⁾because ACS occurs mostly in middle and old aged people; younger aged people have rarely been studied ⁽⁷⁾.

The aim of this study was to assess the risk factors of ACS in those less than 45 years old, so it will have a great role in decreasing the incidence of ACS among young people by removing or controlling the modifiable risk factors.

PATIENTS AND METHOD

This retrospective study was done in Sulaimani Teaching Hospital for cardiac disease. We observed

and analyzed data from 40 cases of ACS who are younger than 45 years old and admitted to hospital. This study started from Sep 2017 to Mar 2018. The inclusion criteria were less than 45 years old people and were diagnosed as ACS by electrocardiogram (ECG) changes, clinical symptoms like chest pain, and biochemical markers like troponin. 45 years old people or above was an exclusion criteria.

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) 23, descriptive analysis was presented as mean ± standard deviation for continuous measures and absolute values (percentages) for categorical measures. A two -tailed t-test were used to compare continuous measures and an exact fisher's test for categorical variables. P value of < or equal 0.05 was regarded as statistically significant.

RESULTS

We had 40 cases of ACS ; most of the cases were male which constituted 82.5% of the cases. 75% of the cases were STEMI, the remainder were NSTEMI and UA. From STEMI cases most of them were inferior STEMI , which constitutes 62.5% of them .The mean age in our study was 40.9 years old. Smoking was present in 55% of the cases, after smoking DM was the second most common associated risk factor in our study which was present in 40% of the cases, hypercholesterolemia specially elevated LDL cholesterol was present in 37% of the cases, about family Hx among the cases it was 32.5%, finally the mean of the BMI was 26.32kg/m², which means most of the cases were overweight or obese.

Table 1. Characteristics of study participants.

| Characteristics of patients | Number (%) |
|-----------------------------|------------|
| Sex | |
| Male | 33 (82.5) |
| Female | 7 (17.5) |
| Smoking status | |
| Smokers | 22 (55) |
| None smokers | 18 (45) |
| Diabetes mellitus | |
| Diabetics | 16 (40) |
| None diabetics | 24 (60) |
| Body Mass Index | |
| Normal weight | 16 (40) |
| Over weight | 18 (45) |
| Obese | 6 (15) |
| FHx of ACS | |
| Positive | 13 (32.5) |
| Negative | 27 (67.5) |
| Types of ACS | |
| ANT.STEMI | 11 (27.5) |
| INF.STEMI | 15 (37.5) |
| LAT.STEMI | 4 (10) |
| NSTEMI | 5 (12.5) |
| UA | 5 (12.5) |

Table 2. Blood lipids measures of patients.

| Blood lipids | Number (%) |
|---------------------|------------|
| Cholesterol | |
| ≤ 200 | 25 (62.5) |
| > 200 | 15 (37.5) |
| Triglyceride | |
| ≤ 150 | 19 (47.5) |
| >150 | 21 (52.5) |
| HDL | |
| ≤40 | 29 (72.5) |
| >40 | 11 (27.5) |
| LDL | |
| ≤129 | 25 (62.5) |
| >129 | 15 (37.5) |

Table 3. Risk factors of ACE.

| | | | Types of ACS | | | | UA | P.Value |
|-------------------|----------|----------------------|--------------|--------|------------|------------|-----|---------|
| | | | INF. STEMI | NSTEMI | ANT. STEMI | LAT. STEMI | | |
| Sex | Male | Count | 12 | 5 | 10 | 1 | 5 | 0.018 |
| | | %within Types of ACS | 80 | 100 | 90.9 | 25 | 100 | |
| | Male | Count | 3 | 0 | 1 | 3 | 0 | |
| | | %within Types of ACS | 0.2 | 0 | 0.091 | 0.75 | 0 | |
| Smoker | Yes | Count | 9 | 4 | 5 | 0 | 4 | 0.093 |
| | | %within Types of ACS | 0.6 | 0.8 | 0.455 | 0 | 0.8 | |
| | No | Count | 6 | 1 | 6 | 4 | 1 | |
| | | %within Types of ACS | 0.4 | 0.2 | 0.545 | 1 | 0.2 | |
| DM | Yes | Count | 6 | 2 | 3 | 4 | 1 | 0.108 |
| | | %within Types of ACS | 0.4 | 0.4 | 0.273 | 1 | 0.2 | |
| | No | Count | 9 | 3 | 8 | 0 | 4 | |
| | | %within Types of ACS | 0.6 | 0.6 | 0.727 | 0 | 0.8 | |
| FHx of ACS | Positive | Count | 4 | 1 | 7 | 1 | 0 | 0.093 |
| | | %within Types of ACS | 0.267 | 0.2 | 0.636 | 0.25 | 0 | |
| | Negative | Count | 11 | 4 | 4 | 3 | 5 | |
| | | %within Types of ACS | 73.3 | 0.8 | 0.364 | 0.75 | 1 | |

Table 4. Age, BMI and lipid profile in cases of ACS

| Variables | Types of ACS | Number | Mean±Std.Deviation | P.Value |
|------------------------|---------------------|---------------|---------------------------|----------------|
| Age | INF. STEMI | 15 | 40.867±2.66 | 0.871 |
| | NSTEMI | 5 | 40.8±3.27 | |
| | ANT.STEMI | 11 | 40.36±5.29 | |
| | LAT.STEMI | 4 | 41.5±2.38 | |
| | UA | 5 | 41.8±2.28 | |
| | Total | 40 | 40.9±3.47 | |
| BMI | INF. STEMI | 15 | 26.73±3.97 | 0.317 |
| | NSTEMI | 5 | 25.2±3.56 | |
| | ANT.STEMI | 11 | 26.54±4.15 | |
| | LAT.STEMI | 4 | 27.0±5.29 | |
| | UA | 5 | 25.2±3.70 | |
| | Total | 40 | 26.32±3.92 | |
| LDL | INF. STEMI | 15 | 110.66±25.9 | 0.857 |
| | NSTEMI | 5 | 115.6±33.23 | |
| | ANT.STEMI | 11 | 105.54±27.58 | |
| | LAT.STEMI | 4 | 108.75±20.96 | |
| | UA | 5 | 133.2±22.70 | |
| | Total | 40 | 112.5±26.63 | |
| Total Cholstrol | INF. STEMI | 15 | 183.6±29.64 | 0.313 |
| | NSTEMI | 5 | 196.4±34.82 | |
| | ANT.STEMI | 11 | 184.54±20.53 | |
| | LAT.STEMI | 4 | 189±17.75 | |
| | UA | 5 | 219.4±27.80 | |
| | Total | 40 | 190.475±28.13 | |
| HDL | INF. STEMI | 15 | 38.66±7.42 | 0.014 |
| | NSTEMI | 5 | 40.4±1.67 | |
| | ANT.STEMI | 11 | 36.81±6.14 | |
| | LAT.STEMI | 4 | 38.0±2.44 | |
| | UA | 5 | 38±6.63 | |
| | Total | 40 | 38.22±5.99 | |
| TG | INF. STEMI | 15 | 196±103.07 | 0.974 |
| | NSTEMI | 5 | 196±102.67 | |
| | ANT.STEMI | 11 | 191.81±77.14 | |
| | LAT.STEMI | 4 | 166.25±24.95 | |
| | UA | 5 | 189.2±67.87 | |
| | Total | 40 | 191.25±83.77 | |

DISCUSSION

Our study showed that most of the cases of ACS in young aged people were male and it is similar to most of the previous studies for example; a study done in Nigeria in that study almost all the cases were male ⁽⁸⁾.

It is mostly due to the role of estrogen in premenopausal women, as it inhibits platelet aggregation and decreases the level of low density lipoprotein ^(4, 9). Also the risk factors like smoking are more common among males ⁽¹⁰⁾. The mean age in our study was 40.9 years old, the minimum was 25 years old, and the maximum was 44 years old. Most of the cases were STEMI which constitute 75% of all the cases, and it is near the result of a study which is done at Tawam hospital, in which 67.6% of the cases were STEMI ⁽¹¹⁾, of STEMI cases 37.5% were inferior STEMI, anterior STEMI were 27.5%, and lateral STEMI constitutes 10% of all cases. The remained 25% was NSTEMI and UA, in which each one constitutes half of the cases. This study showed that smoking is the most predominant modifiable risk factor in cases of ACS in young people, 55% of the cases were smoker, and all of them were male. It tells us that prevalence of smoking in females in our community till now is much lower compared to males. There is a study done in Oman, prevalence of smoking among the cases was high in which 47% of the cases were smoker ⁽¹²⁾. Some authors believe that smoking has more serious effect for developing ACS in young aged females compared to males ⁽¹³⁾. Another risk factor which is strongly associated to ACS was diabetes; it is a metabolic disorder causes many vascular complications including coronary arteries and precipitating atherosclerosis ⁽⁹⁾. In most of the previous studies the prevalence of diabetes was less than 14% of the cases ⁽¹⁴⁾ but in our study was present in 40% of the cases, it is mostly due to coincidence of the other risk factors like smoking, family history and dyslipidemia. In addition of being a risk factor for development of ACS it also affects outcome after ACS ⁽¹⁵⁾. There is a study done in Malaysia in which prevalence of diabetes were more than our study, which was 56.1%, it may be due to their sedentary life style ⁽⁹⁾.

Dyslipidemia which includes (high total cholesterol, low high density lipoprotein (HDL) cholesterol, elevated low density lipoprotein and high triglycerides) is another associated risk factor that increases chance of ACS specially in young people, it is widely prevalent in cases of ACS specially in those diabetic and smokers⁽¹⁶⁾. In our study 37.5% of cases had high total cholesterol,

52.5% of cases their fasting triglycerides were above normal, 40% of cases had elevated LDL and 72.5% of the cases had low HDL.

There is an increased risk of in hospital death after ACS if dyslipidemia not treated and after ACS there will be a change in lipid profile including decreasing total cholesterol, LDL cholesterol and HDL cholesterol, and increasing triglycerides ⁽¹⁷⁾. There is a study done in Cipto Mangunkusmo hospital and the prevalence of dyslipidemia in their study is less compared to our study, only 21% had hypercholesterolemia, 26.1% had elevated LDL, and 38.6% of the patients had low HDL⁽¹⁸⁾. This difference in lipid profile is mostly due to our sedentary life style, and genetic predisposition.

Another risk factor which was prevalent in our study was presence of family history of ACS that tells us the role of genetic in cases of ACS, 32.5% of our cases had family history of ACS, and it is similar to a study which was done in Pakistan, in that study family history was present in 32% of the cases ⁽¹⁹⁾.

Finally, in our study we observed that most of our patients were either overweight or obese, 45% were overweight and 15% were obese. We put at the end because in some studies they said that there is no association between ACS and increased body mass index ⁽²⁰⁾.

Our study limitations were small size sample because the incidence of ACS in young age is relatively rare, and the period of study was short. Another limitation was that we only observed the classical risk factors, we could not investigate for other risk factors like genetic study (polymorphisms in CETP gene), homocysteinemia, and inflammatory conditions that increase risk of ACS like rheumatoid arthritis and systemic lupus erythematosus. The importance of our study is that it is the first study done in our locality about risk factors of ACS.

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