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Study of the Angiographic Profile of Acute Coronary Syndrome in Smokers Compared With Non Smokers

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Abstract:
Background*: To study the angiographic profile of ACUTE CORONARY SYNDROME in smokers versus non smokers and to analyse with respect to baseline characteristics,*
Method*: Patients with first episode of ACS (Unstable Angina with ECG changes, NSTEMI,STEMI) 2. Different types of ACS were diagnosed according to ECG criteria and Troponin T positivity . Smoking history in the form of -tobacco chewing / khaini / beedi / tambaku / cigars was included.*
Results*: Acute myocardial infarction STEMI+NSTEMI) was the most common presentation in both smokers and non smokers But Acute STEMI ,as the initial presentation, was often encountered in smokers .Unstable angina was often encountered as initial presentation in Non smokers s. Single vessel disease was the most common CAG diagnosis in both groups. Triple vessel disease was equally encountered in both* ***Conclusions****: Acute coronary syndrome occurred seven years earlier in smokers 2.Smokers presented with more Acute infarctions and less Unstable angina 3.Single vessel disease was the most common CAG diagnosis in both smokers and non smokers.*
Keywords: *STEMI ST elevation myocardial infarction, USA unstable angina, NSTEMI non ST elevation myocardial infarction, CVD Cardiovascular disease*.

I. Introduction

Cardiovascular disease is the leading cause of death globally(1). Cigarette smoking is a major modifiable risk factor for CVD, including coronary artery disease (CAD), stroke, peripheral vascular disease, and congestive heart failure (2,3). The relationship between cigarette smoking and many established risk factors for CVD have been studied. Cigarette smoking is associated with higher levels of serum

cholesterol, coronary vasomotor reactivity, platelet aggregation, and a prothrombotic state (4,5,6,7) . (8). There are multiple and interacting determinants that affect smoking (9). These are physiological factors (nicotine addiction), personal characteristics (demographics, personality, education, information), cognition and skills, environment (social, cultural, economic and political) and other concomitant habits (drinking alcohol, coffee etc) (10). Cigarette smoking is the most widespread type of tobacco use world over but in India chewing tobacco and bidi are the dominant forms of tobacco consumption (19).

II. Materials And Methods:

Inclusion Criteria:
1. Patients with first episode of ACS (Unstable Angina with ECG changes, NSTEMI,STEMI) attending the ICCU, Department of Cardiology, KGH, Visakhapatnam,
2. Different types of ACS were diagnosed according to ECG criteria and
Troponin T positivity 3.Both Smokers and non Smokers were included in the study group. Smoking history (all forms-tobacco chewing / khaini / beedi / tambaku / cigars).
4. Troponin positivity (qualitative) for NSTEMI differentiating from USA with ECG changes.
5.Coronary angiogram was done after 5 days of Heparin theraphy in acute coronary syndrome.

Exclusion Criteria:
1. Age<18yrs/>80yr
2. Patients with recurrent episode of ACS and Cardiogenic shock
3. Patients with Valvular heart diseases/cardiomyopathies/pericardial diseases/conduction diseases other than ischemia
4. Contradications to CAG(pts with serum creatinine >1.5mg/dl,lack of consent for CAG) and prior coronary angiogram report.
5. Unstable Angina without ECG changes. disease(TVD),Left main coronary artery(LMCA) involvement, Proximal
LAD involvement.

Statistical Analyses:

The observations were recorded in a proforma created for this purpose and entered in the master chart . Statistical Analysis was done using SPSS software . Mean, median, standard deviation and Chi Squares were calculated wherever applicable. A value of $p<0.05$ was considered statistically significant.

III. Results:

In the smokers group,Acute coronary syndrome was more frequently encountered in males (74.1% versus 39%,$p<0.001$) Non smokers group,Acute coronary syndrome was often encountered in females (61% versus 28%). Out of 108 study subjects in the smokers, Diabetes mellitus was present in 26(24%)subjects. Out of 100 study subjects in the non smokers,Diabetes mellitus was present in 44(44%) subjects.Diabetes mellitus was less commonly encountered in the smokers group(24% versus 44%,$p< 0.005$,statistically significant) Hypertension was present in 56(51.9%) subjects.,Hypertension was present in 60(60%)subjects.Hypertension was commonly encountered in both study groups(51.9% versus 60%,$p>0.05$,statiatically non significant).

Smokers group, Overweight/Obesity was present in 74(68.5%)subjects. Non smokers group ,Overweight/Obesity was present in 33(33%)subjects. Family history of CAD was less commonly and equally distributed in both study groups(19.4% versus 25%,$p>0.05$, statiatically non significant) . Acute myocardial infarction(STEMI+NSTEMI) was the most common presentation in both smokers(87.1%) and non smokers(70%).But Acute myocardial infarction,as the initial presentation, was often encountered in smokers (87.1% versus 70%,$p<0.001$,statistically significant).Unstable angina was often encountered as initial presentation in Non smokers (30% versus 12.9%,$p<0.001$, statistically significant). Single vessel disease was the most common CAG diagnosis in both the smokers and non smokers(45.3% versus 51%,$p>0.1$,Non significant).Double vessel disease,even though not statistically significant, was more commonly encountered in smokers (26.8% versus 18%,$p>0.1$,Not significant). The smokers group, LMCA stenosis (>30% diameter stenosis) was present in 8(7.4%) subjects. in the non smoker group,LMCA stenosis was present in 10(10%)subjects.No statistically significance difference.The LMCA stenosis was often encountered in Diabetic study subjects in both study groups(70.4% in diabetics,29.6% in non diabetics,$p<0.001$,statistically significant difference). 28 patients (25.9%) had LV dysfunction with EF < 50% by echocardiography. 80 patients (74.1%) had normal LV function. The mean EF was 55.56+/-10.16%. The median EF was 56.5%. 48 (44.4%) patients presented with Anterior wall STEMI which was the most common presentation of ACS in Smokers followed by inferior wall MI(34.3%) . Only 2 (1.9%) patients were presented with high lateral / true posterior wall STEMI.

IV. Discussion

In the present study,the majority of patients in the smoking group were males (74.1%) when compared to females but majority of patients in the non smoking group were females(61%).The mean age of the patients in the smoking group was 53.52years and in the non smokers,mean age was 59.48years. smoking reduced the age at which the first coronary event occurred by approximately seven years.

Majority of the study subjects reached ICCU with acute myocardial infarction as acute coronary event but Unstable angina with ECG changes was often encountered in the non smokers group. The smokers had a greater prevalence of infarction and less unstable angina,probably related to younger age and due to the procoagulant effect
of tobacco.

In smokers, anteriorwall STEMI(44.1%) was the most common presentation followed by acute inferior wall STEMI(34.3%). A stronger association was seen between smoking and obesity and a weaker one with Diabetes mellitus.Diabetes mellitus was more common in the non smoker group.Hypertension had no association with smoking. Smokers had a relatively greater number of associated risk factors than non smokers.The smokers had more obesity than non smokers. Majority of the patients(74.1%) in the study group had EF >50% with mean EF was 55.56%. The Combined form of Tobacco(64.8%) use was the most commom in the smokers group and difficulty to measure smoking index in all smoking subjects and heavy smoking (smoking index>/=20 pack years) was less common (3.29%).Present study included patients with 79 current smoking and Ex smoking within 6 monthes of cessation with all forms of smoking. Majority of the study subjects in smokers had the dominant Right coronary artery and the Rigyt coronary artery was codominant in 2.8%in smokers. Type 3 LAD was seen in majority of the smokers(92.6%). Single vessel disease was the most common CAG diagnosis followed by Double vessel disease was in both smokers and non smokers.

Significant LMCA(>/=30%diameter stenosis) involvement was often seen in Diabetic patients as an additional risk factor in smokers.There was no significant difference between males and females with respect to number of vessels involved in study population. LAD was the artery predominantly involved in smokers .Among the involved coronaries, discrete lesions were predominantly seen when compared to long/diffuse lesions in each of the individual vessels in smokers group compared to non smokers. There was no statistical

difference with respect to proximal LAD involvement(>/= 40%diameter stenosis) between smokers and non smokers.

An analysis between the baseline characteristics and the angiographic profile in smokers was suggestive of the following features. Significant coronary artery involvement (diameter stenosis>/=40% of the reference vessel) was seen in a higher proportion of patients who were older than 50 years, in a higher proportion of patients who were diabetics , hypertensive & obese patients in addition to the smoking.

The LMCA was involved in majority of patients older than 50years and often seen in Diabetics in all study subjects. GRACE is a multinational observational registry and compared smokers Vs non smokers in acute coronary syndrome and based on 19,325 patients aged at least 18 years admitted for acute coronary syndromes .

GRACE study showed that Smokers were more frequently diagnosed with STEMI (46.0%) than former smokers (27.4%) and nonsmokers (30.2%(P<0.001). Smokers were mostly men, were younger than non-smokers across the three acute coronary syndrome groups.(115). In the study by Jain T Kallarakkal et al,published in The Indian

hert journal in October 2005, Clinical Outcome and Angiographic Profile of Acute Myocardial Infarction in Smokers were studied.The baseline characters included All smokers admitted with acute MI were males and their mean age was 48 ± 11.6 years. 39% of patients were diabetics , 36 % of patients were hypertensives and 26 % had a family history of CAD. 71% of patients were smokers and 61 % had anterior wall MI, 36 % had inferior wall MI and 3% had true posterior wall MI. 81% received thrombolytic therapy with a window period of 2.1 ± 1.9 hours. 59 % had normal LV systolic function and 22% had LV dysfunction (mean EF 42 ± 4 %). . In coronary angiogram, single vessel disease was seen in 42% of patients and multi vessel disease in 37% of patients. Recanalised coronary arteries with no significant flow limitingdisease were seen in 21% of patients.Multi vessel disease was seen in patients with diabetes or newly detected diabetics. Multi vessel disease was higher in patients with LV dysfunction (68%) whereas recenalised coronaries after thrombolytic therapy was 9 %. 81 . In comparison with above two studies, present study showed younger age of presentation of acute coronary syndrome in smokers, often seen in males, with mean age of 53.52 years and smokers had more obesity and less diabetes mellitus when compared to non smokers. Single vessel disease, LAD involvement were seen in a higher percentage of patients in the present study subjects.

V. Conclusions:

1.Acute coronary syndrome occurred seven years earlier in smokers compared with non smokers.(p<0.05)
2.Smokers were frequently male subjects compared with non smokers (p<0.001)
3.Smokers had a lower prevalence of Diabetes compared with non smokers (p<0.001)
4.Smokers had a higher prevalence of Obesity compared with non smokers (p<0.001)
5.Smokers presented with more Acute infarctions and less Unstable angina compared with non smokers (P<0.001)
6.Anterior wall STEMI was the most common Acute coronary syndrome among smokers.
5.Single vessel disease was the most common CAG diagnosis in both smokers and non smokers.
6.LMCA involvement was commonly encountered in both smokers and non smokers who had diabetes mellitus.

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