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FEASIBILITY, EFFICACY OUTCOME AND SAFETY OF PRIMARY ANGIOPLASTY IN FEMALE PATIENTS WITH ST – ELEVATION MYOCARDIAL INFARCTION PRESENTING TO A TERTIARY CARE HOSPITAL.

Cardiology

KEYWORDS:

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ABSTRACT

Background: In acute myocardial infarction (AMI), primary percutaneous transluminal coronary angioplasty (PTCA) has proved to be the best therapeutic approach. However , previous studies mentions differences in the outcomes in the females as compared to males who undergo primary angioplasty.

Aim: To evaluate gender influence on clinical outcome and in-hospital mortality in patients with ST elevation myocardial infarction(STEMI) who undergo primary percutaneous interventions.

Methods: We studied 32 consecutive patients (10 women, 31.2 %), who underwent primary PTCA between February 2016 and September 2016 . The following parameters were analyzed : risk factors for coronary artery disease including hypertension, diabetes, smoking, hypercholesterolemia and family history, previous AMI, PTCA or angina, door-to-balloon time, extent of coronary disease and outcome.

Results: Female patients were older (60.6 yrs min 50yrs, max 85 yrs) with hypertension in majority of them (60% of the patients). Diabetes mellitus and hyperlipidemia was present in 40% of the patients. All the females were post menopausal. Angina was presenting symptom in all of them. One female was in Killip class II, all others were in Killip class I at presentation. None of the patient had smoking as risk factor. Door- to-balloon time was longer in women(mean 6.8 hours). LAD was most frequently involved vessel(60%) followed by RCA(40%). Glycoprotein IIb/IIIa inhibitors were used in 2 patients . Eight patients underwent stenting while 2 underwent balloon angioplasty alone. The procedure was uneventful in all the patients. Symptom relief noted immediate post procedure. Mean Left ventricular ejection fraction at discharge was 45%. No death or major adverse cardiovascular event occurred in 30 day follow up.

Conclusions: Primary angioplasty is feasible, efficacious and safe approach for treatment of AMI with good procedural outcome and no significant complication. Longer duration study with larger sample size will lead to further insight into the topic.

Introduction

The proportion of women diagnosed with CAD has increased in recent years[1], but it is still underdiagnosed and undertreated compared to men, with less use of revascularization strategies and optimized medical therapy.[2] Furthermore, the belief persists that women have worse prognosis than men following primary percutaneous coronary intervention (PPCI).[3,4] Women's greater mortality may be explained by the fact that they have a higher cardiovascular risk and that CAD is underdiagnosed and undertreated in women, or be due to gender-related differences in anatomy and biological response to infarction.[3] Previous registries have presented conflicting evidence as to whether female gender is an independent risk factor for mortality in ST-elevation myocardial infarction (STEMI).[3-7]

Our aim was to analyze the situation regarding treatment of STEMI in women by PPCI based on the profile and outcome of the female patients admitted with acute MI in a PCI capable tertiary care centre , and to assess how gender influenced in-hospital prognosis of these patients.

Methods

Between February 2016 and September 2016, 32 patients were included. We retrospectively analyzed patients undergoing PPCI in the context of STEMI of less than 12 hours evolution. STEMI was defined as the presence of symptoms consistent with myocardial ischemia lasting more than 30 minutes and persistent ST elevation (>1 mm in two contiguous leads) or new-onset or previously undocumented complete left bundle branch block. Patients who underwent thrombolysis during the index hospitalization were excluded.

No exclusion criteria were applied in terms of the complexity of STEMI presentation or type of lesion.

All patients gave their informed consent for inclusion.

Men and women were compared in terms of demographic characteristics, risk factors, previous cardiovascular history, disease severity, location of myocardial infarction (MI) and procedural characteristics.

Results

Women were older (mean 60.6 years , minimum 50yrs , maximum 85 yrs) and had a higher prevalence of diabetes (30%), hypertension (69%) and chronic renal failure (4%). On the other hand, they were less likely to smoke and less often had a history of coronary disease, including MI , PCI or coronary artery bypass grafting (CABG). All the females were post menopausal. Women were revascularized later than men (6.8 hours vs. 4.9 hours in males) as they arrived at hospital later, and the percentage of revascularized within six hours of symptom onset was lower in women (40%). The proportion of patients undergoing PPCI who went directly to a center with interventional cardiology facilities was greater among women, but this did not influence door-to-balloon times. Angina was presenting symptom in all of them. One female was in Killip class II , all others were in Killip class I at presentation. LAD was most frequently involved vessel(60%) followed by RCA (40%). Glycoprotein IIb/IIIa inhibitors were used in 2 patients . Eight patients underwent stenting while 1 underwent balloon angioplasty alone. The procedure was uneventful in all the patients. Symptom relief noted immediate post procedure. Mean Left ventricular ejection fraction at discharge was 45%. No death or major adverse cardiovascular event occurred in 30 day follow up.

Discussion

As seen in most other studies on coronary revascularization, both surgical and percutaneous, clinical presentation of coronary disease differs between the males and females.[3-6,8,9] Women tend to present at older ages with acute coronary syndrome as compared to males, and more often have atypical symptoms rather than classic angina. They also have a higher prevalence of diabetes and hypertension, and the presence of multiple cardiovascular risk factors especially amongst post-menopausal women.

Despite the higher risk profile of women undergoing PPCI, disease severity is similar to males including similar prevalence of multivessel disease.[9]

Though the females less often have previous MI and present similar left ventricular function to men, the incidence of congestive heart failure and cardiogenic shock at admission is significantly higher in them as observed in numerous studies.[3,4,9] The most frequently suggested explanation is the greater prevalence of diastolic dysfunction due to older age and hypertensive heart disease.[10] Hypertrophied myocardium is more vulnerable in situations of transient ischemia, the decreased diastolic compliance that occurs following sudden occlusion of a vessel being less well tolerated in patients with a preexisting "stiff" ventricle.[10] Also, the higher incidence of hemodynamic instability at admission may be explained by the fact that women arrive in the catheterization laboratory after a longer delay from symptom onset.[3] The time to revascularization is thus longer in women due to longer prehospital delay and door to balloon time.[3,4,11] Changes in their lifestyle, with increased prevalence of smoking, change in dietary habits, use of oral contraceptives and increasing numbers of women in employment are the factors considered responsible for increase in the incidence of CAD in Indian females.[12] This, together with the fact that cardiovascular disease is still the leading cause of death in women,[1] highlights the importance of implementing measures to raise awareness among women of the symptoms of MI and of the need to seek immediate medical attention. The longer delay between symptom onsetand presentation to PCI capable centre is one of the modifiable predictors of a worse prognosis.

Procedural characteristics

There are also gender-based differences in procedural characteristics. Smaller caliber arteries, together with a greater tendency for arterial vasospasm, may explain the less frequent use of radial access in women in previous studies. However , we were able to carry out the procedure through the radial access in most of them. Ticagrelor was the preferred antiplatelet in most of the patients due to better efficacy. Glycoprotein IIb/IIIa inhibitors are far less often administered in women as adjuvant therapy to antithrombins in primary angioplasty. This may be because women undergoing PCI present more bleeding and vascular complications than men. A subset analysis of the ACUITY trial showed that women have more bleeding complications at 30 days compared to men, but with no differences in short- or long-term mortality. Women treated with bivalirudin have fewer bleeding complications compared to those receiving heparin together with glycoprotein IIb/IIIa inhibitors, but with no difference in ischemic events.

Evidence shows that there are still gender-based differences in treatment of coronary disease, with women presenting STEMI and age >65 years less often receiving reperfusion therapy.[1] In India , there has been a progressive increase in recent years in women undergoing PPCI, with reduced in-hospital mortality for STEMI in both sexes. However, despite these advances in STEMI treatment, in-hospital mortality in India remains higher in women, who failed to receive standard care and timely revascularization, which highlights the need for strategies to improve general awareness, diagnosis and treatment of cardiovascular disease in women.

Limitations

The present study was observational, non- randomized with smaller sample size and may therefore be subject to confounding factors. Further studies with larger sample size is necessary to reinforce the current findings.

Conclusion

Coronary artery disease in females in India is a rapidly increasing problem with AMI as its deadliest manifestation . With recent data it seems Primary angioplasty is feasible, efficacious and safe approach for treatment of AMI with good procedural outcome and no significant complication. Longer duration study with larger sample size will lead to further insight into the topic.

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