

Majority of the strategies attempting to improve cardioprotection like thrombectomy devices, distal embolization devices, glucose insulin potassium infusion, adenosine, endovascular cooling etc., have yielded equivocal results because of delayed time to reperfusion. In the present study mechanical reperfusion was established within 6 h of symptom onset, hence ensuring reasonable reperfusion window period.

In our opinion this is an important landmark study showing potential cardioprotective benefit of EIVBB in STEMI patients undergoing primary PCI within 6 h and having no contraindications for BB and it may play a vital role in the future in shifting the guideline for IV beta-blocker from class IIa to class I, especially in acute anterior wall MI with sympathetic stimulation and Killip class \leq II. The 20% greater reduction in infarct size above that was achieved by mechanical reperfusion offers great hope. Hence EIVBB can be regarded as an asset with certainty for cardioprotection. Well-designed RCTs aiming to achieve improvement in hard clinical outcomes with EIVBB in STEMI patients is the need of the hour.

REFERENCES

- Hjalmarson A, Herlitz J, Holmberg S, et al. The Goteborg metoprolol trial. Effects on mortality and morbidity in acute myocardial infarction. *Circulation*. 1983; 67(6 Pt 2):126.
- Freemantle N, Cleland J, Young P, Mason J, Harrison J. B Blockade after myocardial infarction: systematic review and meta regression analysis. *BMJ*. 1999;318:1730.
- Pfisterer M, Cox JL, Granger CB, et al. Atenolol use and clinical outcomes after thrombolysis for acute myocardial infarction: the GUSTO-I experience. *JACC*. 1998;32:634–640.
- Chen Z, Jiang L, Chen Y, et al, COMMIT (CLOpidogrel and Metoprolol in Myocardial Infarction Trial) collaborative group. Addition of clopidogrel to aspirin in 45,852 patients with acute myocardial infarction: randomised placebo-controlled trial. *Lancet*. 2005;366:1607–1621.
- Halkin A, Grines CL, Cox DA, et al. Impact of intravenous beta-blockade before primary angioplasty on survival in patients undergoing mechanical reperfusion therapy for acute myocardial infarction. *JACC*. 2004;43:1780–1787.
- Valle JA, Zhang M, Dixon S, et al. Impact of pre-procedural beta blockade on inpatient mortality in patients undergoing primary Percutaneous Coronary Intervention for ST Elevation myocardial infarction. *AJC*. 2013;111:1714–1720.

Suraj Khanal*

Assistant Professor of Cardiology, Department of Cardiology,
3rd Floor, Block-C, Advanced Cardiac Center, PGIMER,
Chandigarh 160012, India

R. Vadivelu

Senior Resident in Cardiology, PGIMER, Chandigarh, India

*Corresponding author. Tel.: +91 (0) 9878222526.

E-mail address: khanal.s@rediffmail.com

0019-4832/\$ – see front matter

<http://dx.doi.org/10.1016/j.ihj.2013.12.044>

Dario Sillano, Chiara Resmini, Emanuele Meliga, Giacomo Boccuzzi, Andrea Zuffi, Emanuele Barbato, Julian Gunn, Matthew Price, Fiorenzo Gaita, Imad Sheiban, Retrospective multicenter observational study of the interventional management of coronary disease in the very elderly: The NINETY. *Catheter Cardiovasc Interv* 82 (2013) 414–421.

Objectives: The aim of this observational, multicenter study was to describe the outcome of very elderly patients undergoing percutaneous coronary intervention (PCI).

Background: There is a paucity of data among nonagenarians undergoing PCI.

Methods: All consecutive patients 90 years of age or older undergoing PCI with stent implantation between April 2002 and June 2009 were included in the study. The primary endpoint was the long term rate of net adverse cardiac events (NACE), that is, death, myocardial infarction (MI), target lesion revascularization, and life threatening or major bleedings.

Results: One hundred forty-six nonagenarians were divided in three groups according to clinical setting: 27 (group A) stable angina or silent ischemia, 85 (group B) unstable angina or non-ST elevation MI, and 34 (group C) with ST elevation MI (STEMI). At 30 days, the incidence of NACE was significantly lower in patients in Group A vs. B or C (0% vs. 17.3% vs. 31.2%, $p = 0.006$), and the frequency of definite stent thrombosis was higher in Group C vs. A or B (9.4% vs. 0% vs. 0%, $p = 0.007$), respectively. Up to a median follow up of 24 months, NACE rate was 33.3% in group A, 49.3% in group B, and 50% in group C ($p = 0.32$). There were no significant differences between groups in the individual components of the primary endpoint.

Conclusions: PCI in nonagenarians is safe and feasible with acceptable major bleeding rates. However, long term results show high mortality rates particularly in the STEMI group.

1. Perspective

1.1. NINETY – age not a PENALTY

With an increase in life expectancy, there is a significant increase in the elderly and very elderly population. This trend is expected to increase further in the coming years. CAD is an important cause of mortality in the very elderly age group. Elderly age is an independent risk factor for short term mortality in CAD, especially STEMI patients. Atypical symptoms, late presentation, lack of timely medical advice and transportation to hospitals with critical care units put this population at high risk with increased complications and adverse effects. Elderly and very elderly patients are usually excluded from the major trials of revascularization and optimal treatment strategies and outcomes in this subgroup are less clear.

Thrombolytic therapy was thought to be associated with increased bleeding risks in elderly, especially intracranial bleeding, as compared to primary PCI, but major trials testing this hypothesis had failed to prove it.^{1,2} In fact, registry data show that less than 50% of the elderly patients receive any form of revascularization therapy despite suggested mortality benefit. About 20–30% of these patients undergoing PCI

present with STEMI and around 5% of the patients present with high risk features like ventricular arrhythmias and congestive cardiac failure.³ Dynina et al reported that patients with age > 85 years undergoing PCI more commonly developed stroke and renal failure requiring dialysis as compared to patients with age < 85 years.⁴ In that study it was also shown that age was not an independent risk factor for excess in hospital mortality in the very elderly cohort.⁴

In the present study, both short term and long term mortality was highest in STEMI patients as compared to UA/NSTEMI and stable angina group. Antonsen et al showed a similar finding with the highest short term and 1-year mortality among elderly STEMI patients as compared to stable angina patients.³

The most common type of stent used in this study in all three groups (STEMI/NSTEMI/stable angina) was BMS as compared to DES (67% vs. 22.6%) and only 13.3% of patients in STEMI group had received DES. In spite of this it did not reveal any difference in TLR rates. One of the reasons for this finding could be inadequate power of the study to elucidate difference in TLR between BMS and DES. This is in contrast to another study which has shown that usage of DES in elderly patients has increased from 0.0% to 60.3% from the year 2002–2008 and TLR has reduced from 7.1% to 2.5% during that corresponding period.³

Both at short term and long term follow up, the occurrence of stent thrombosis (ST) was higher in STEMI patients. STEMI is a known independent risk factor for ST both in young and elderly patients. Hypercoagulable state associated with STEMI is the possible explanation for this finding and due to perceived higher risk of ST, DES is being used in only in less than one third of elderly STEMI patients.³

Though the present study is only an observational study, the enthusiasm for conducting randomized controlled trials in elderly CAD patients undergoing PCI was already shattered by premature termination of two such trials in the elderly, Senior-PAMI and TRIANA trials, due to slow enrolment. This study is one of the very few studies available in such a very elderly age group and this is the only study showing long term outcomes upto 2 years of follow up. It also gives positive hope on bleeding risks in elderly.

In our opinion, with increasing aging of population and increased access to healthcare, we are likely to encounter more and more patients with CAD requiring intervention in the very elderly cohort. We should not leave such patients at the mercy of God and in spite of perceived increased risk, we should try to do our best for such patients. The present study supports this observation and shows that PCI is feasible in the very elderly with acceptable mortality, NACE and bleeding risks, with highest events occurring in STEMI group (like in any other age group).

REFERENCES

1. Grines Sr C. PAMI: a prospective randomized trial of primary angioplasty and thrombolytic therapy in elderly patients with acute myocardial infarction. *Transcatheter Cardiovasc Therap.* 2005.

2. Bueno HC, Betriu A, Heras M, et al. Primary angioplasty vs. fibrinolysis in very old patients with acute myocardial infarction: TRIANA (TRatamiento del Infarto Agudo de miocardio en Ancianos) randomized trial and pooled analysis with previous studies. *EJH.* 2011;32:51–60.
3. Antonsen L, Jensen LO, Thayssen P, et al. Comparison of outcomes of patients ≥ 80 Years of age having percutaneous coronary intervention according to presentation (stable vs unstable angina pectoris/non ST-segment elevation myocardial infarction vs ST-segment elevation myocardial infarction). *Am J Cardiol.* 2011;108:1395–1400.
4. Dynina O, Vakili BA, Slater JN, et al. In-hospital outcomes of contemporary percutaneous coronary interventions in the very elderly. *Catheter Cardiovasc Interven.* 2003;58:351–357.

Suraj Khanal*

Assistant Professor, Department of Cardiology, 3rd Floor, Block-C, Advanced Cardiac Center, PGIMER, Chandigarh 160012, India

R. Vadivelu

Senior Resident in Cardiology, PGIMER, Chandigarh, India

*Corresponding author. Tel.: +91 (0) 9878222526.

E-mail address: khanal.s@rediffmail.com

0019-4832/\$ – see front matter

<http://dx.doi.org/10.1016/j.ihj.2013.12.045>

Stephen G. Worthley, Costas P. Tsioufis, Matthew I. Worthley, Ajay Sinhal, Derek P. Chew, Ian T. Meredith, Yuvi Malaiapan, Vasilios Papademetriou, Safety and efficacy of a multi-electrode renal sympathetic denervation system in resistant hypertension: the EnlightHTN I trial. *Eur Heart J* 34 (2013) 2132–2140.

1. Background

Catheter-based renal artery sympathetic denervation has emerged as a novel therapy for treatment of patients with drug-resistant hypertension. Initial studies were performed using a single electrode radiofrequency catheter, but recent advances in catheter design have allowed the development of multi-electrode systems that can deliver lesions with a pre-determined pattern. This study was designed to evaluate the safety and efficacy of the EnlightHTN, a multi-electrode system.

2. Methods and results

We conducted the first-in-human, prospective, multicentre, non-randomized study in 46 patients (67% male, mean age 60 years, and mean baseline office blood pressure 176/96 mmHg) with drug-resistant hypertension. The primary efficacy objective was change in office blood pressure from baseline to 6 months. Safety measures included all adverse events with a focus on the renal artery and other vascular