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Influence of Age and Gender on Clinical Outcomes Following Percutaneous Coronary Intervention for Acute Coronary Syndromes

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Background

Gender and age are non-modifiable factors influencing clinical outcomes in acute coronary syndromes (ACS). There is evidence that coronary artery disease pathophysiology varies in women. We therefore evaluated the effect of age and gender on clinical outcomes in patients with ACS undergoing percutaneous coronary interventions (PCI).

Methods

Among 3178 (25% female) consecutive ACS patients who underwent PCI at Liverpool Hospital, Sydney from 2003 to 2010, using femoral access in 98% of cases, we determined late events including mortality, myocardial infarction and bleeding according to Bleeding Academic Research Consortium (BARC) criteria.

Results

Females compared with males were older (median 68 vs. 60 years; $p < 0.001$), and were more likely to have diabetes (30% vs. 22% $p < 0.001$), hypertension (62% vs. 49%, $p < 0.001$), anaemia (26% vs. 15%, $p < 0.001$), and renal impairment (43% vs. 20%, $p < 0.001$); they were more likely to be non-smokers (19% vs. 30%, $p < 0.001$). Females had less class B2/C lesions (64% vs. 68%, $p = 0.048$), but had more calcified lesions (20% vs. 11%, $p < 0.001$), and smaller stent diameters (2.75[2.5–3.0] vs. 3.0[2.75–3.5] mm, $p < 0.001$). Females had higher three-year mortality rates (11% vs. 7.0%, $p = 0.001$), and more type 2–5 BARC bleeding post-PCI (22% vs. 16%, $p = 0.003$). Among patients under 55 years ($n = 988$), mortality and bleeding were higher in females (6.0% vs. 3.0%, $p = 0.028$) and (26% vs. 14%, $p = 0.001$) respectively. There was no effect of gender on mortality or bleeding in patients 55 years and over. However, on multivariable stepwise regression analysis, female gender was not an independent predictor of mortality, but was a significant predictor of bleeding (OR=1.84 [95% CI:1.38–2.45], $p < 0.001$).

Conclusion

Bleeding and mortality were higher in younger females with ACS who underwent PCI. While females had more post-PCI bleeding events, which were associated with late mortality, gender per se was not an independent predictor for mortality.

Keywords

Acute coronary syndromes • Mortality • Bleeding • Gender • Renal dysfunction

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Introduction

Female patients presenting with acute coronary syndromes (ACS) often have a higher prevalence of coronary risk factors such as diabetes and hypertension, resulting in increased late morbidity and mortality compared with male patients.[1–3] In ACS patients percutaneous coronary intervention (PCI) with stent deployment improves clinical outcomes of both genders.[4–6] However, as these patients receive both dual antiplatelet therapy and a thrombin inhibitor, bleeding is the major non-ischaemic complication of PCI, and females are at increased risk of bleeding, compared to males.[7,8] Moreover, radial access may not reduce the risk of bleeding (as defined by the Bleeding Academic Research Consortium (BARC)), or vascular complications post-PCI compared with femoral access in females.[9–11] Also, female patients have been reported to have worse post-procedural adverse outcomes compared with male patients.[2,12] The age of the patient is a non-modifiable risk factor for mortality after an ACS. Previous studies have reported that an ACS presentation in female patients tends to be almost a decade older than in males.[13] As a few studies have reported associations between the non-modifiable risk factors of age and gender with the long-term outcome post-PCI in females with ACS, we examined factors potentially associated with increased

adverse events including, in particular, peri-procedural bleeding and pre-PCI renal function.

Methods

Study Population

The study population consisted of consecutive patients, presenting directly to a tertiary centre, or to referral hospitals in the area, who underwent PCI for ACS (unstable angina, non-ST segment elevation MI [NSTEMI] and ST-segment elevation myocardial infarction [STEMI]) at the cardiac catheterisation laboratory at Liverpool Hospital, Sydney, Australia from 1st October 2003 to 31st March 2010.

Patients were divided into two age groups, patients under 55 years and patients 55 years and older (Figure 1), based on the median age of menopause in Australia.[14] Exclusions were patients with stable coronary heart disease (CHD) and repeated PCI on the same patients. All patients had detailed clinical, angiographic and procedural data collected prospectively from the medical records and reports within the cardiology department and hospital laboratory databases. This data included procedural indications, patient demographics, medications, angiographic lesion characteristics, and stent types (drug-eluting stent [DES]

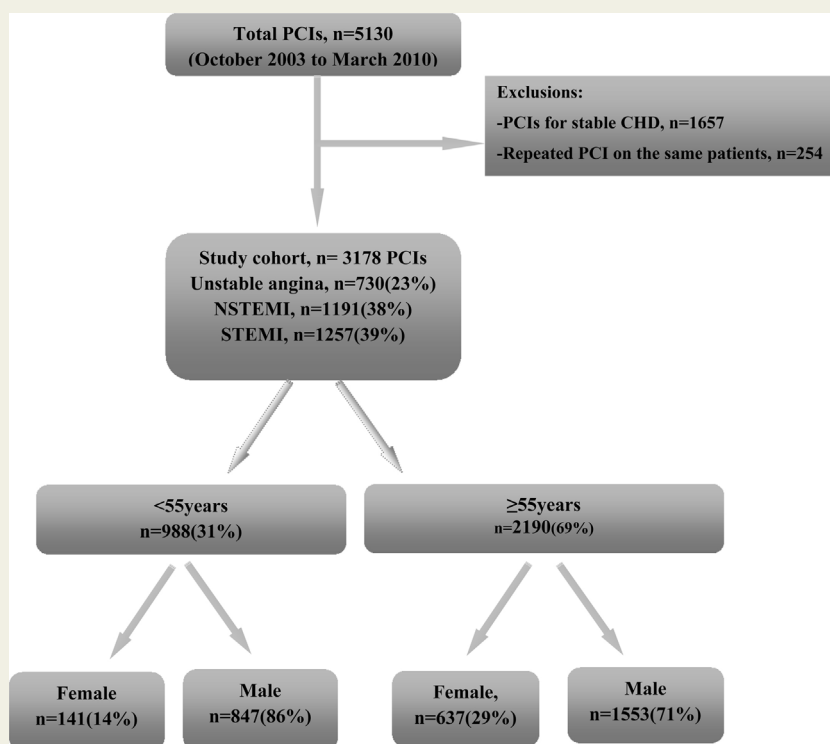


Figure 1 Study Population. The diagram shows the patients from the total angioplasty cohort, with the reasons for exclusion from the current study for those who underwent PCI in the study period shown. PCI, Percutaneous coronary intervention; CHD, Coronary heart disease; STEMI, ST-segment elevation myocardial infarction; NSTEMI, Non-STsegment elevation MI; CABG, Coronary artery bypass graft.

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