Early data suggests that the chimney technique may provide results that are similar to open procedures in terms of success of repair even when the patient has anatomy that makes traditional endovascular repair difficult, said Dr. Rosa. In a nonrandomized study of 21 patients with juxtarenal or pararenal aneurysms who underwent repair using the chimney technique and were compared with 21 matched open cases, mortality was similar at 4.8% in each group (one death in each group). The frequency of renal dysfunction was also similar between the two groups occurring in 6 patients (29%) in the endovascular group and 5 patients (1 patient with acute kidney injury and 4 patients with acute renal failure) in the open group. Dr. Rosa pointed out that this yielded a rate of renal complications similar to that found in the literature for open cases in which the renal cross-clamp is performed [Bruen KJ et al. *J Vasc Surg* 2011].

Another technique that makes percutaneous aneurysm repair possible is the preclose method. This technique prepares the arteriotomy for percutaneous repair prior to removal of the sheath. This method was successful in 94.3% of cases according to a study in which 559 Proglide devices were used to repair 279 femoral arteries [Lee WA et al. *J Vasc Surg* 2007]. There were only 16 failures, some of which were attributed to patient obesity and severe calcifications of the artery. Dr. Rosa commented that even in the presence of severely calcified vessels, the preclose method could still be performed if used in conjunction with an ultrasound device.

Custom-made fenestrated grafts used to accommodate visceral arteries is another way to increase the available proximal landing zone in difficult to treat patients. According to a retrospective observational study conducted at the Cleveland Clinic [Greenberg RK et al. *J Vasc Surg* 2009], 30 patients were treated with fenestrated devices over a 1-year period, with a 100% procedural success rate. Two-year follow-up data was available for 23 patients, and showed that 69.6% of the patients experienced a decrease in size of their aneurysm. There were no aneurysm-related deaths, ruptures, or conversions into open repair at 2-year follow-up.

Dr. Rosa concluded that percutaneous repair of aneurysms has now become the predominant method of performing the procedure and will likely become even more widespread with the invention of new techniques and devices which expand their indication.



## Sex-Specific Differences in Pathophysiology, Presentation, and Outcomes in Coronary Artery Disease

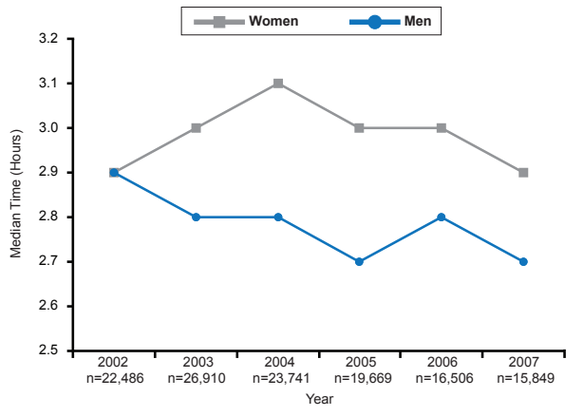
Written by John Otrompke

The past decades have demonstrated significant improvements in the care and resulting outcomes of patients presenting with an acute coronary syndrome (ACS). In her presentation, Angela Maas, MD, PhD, University Medical Center in St Radboud, Nijmegen, The Netherlands, highlighted some of the differences between the development of coronary disease, its clinical presentation, and the outcomes between men and women. For example, a well-described phenomenon is that women presenting with ST-elevation myocardial infarction are more than twice as likely to have "nonobstructive" coronary epicardial disease compared with men, yet higher mortality [Anderson RD et al. *Circulation* 2007].

One possible cause of higher mortality rate in women might be a longer time from symptom onset to hospital presentation, perhaps because the impact of cardiovascular disease is often underappreciated by women and the presence of "atypical" symptoms may obscure the true etiology. For instance, 37% of women present without pain during an ACS, compared with only 27% of men [Canto JG et al. *Arch Intern Med* 2007]. Other symptoms in women could include difficulty breathing, flu symptoms, fatigue, anxiety or loss of appetite. Studies in the past decade have found that women usually present 17 to 20 minutes later than men when having an MI (Figure 1) [Kaul P et al. *Am Heart J* 2011; Diercks DB et al. *Am Heart J* 2010]. Consideration of alternative diagnoses in women is also critical, especially coronary dissection in those aged <60 years and stress-induced cardiomyopathy depending upon the presentation [Mackman N. *Nature* 2008].

Physicians should also be aware that mortality is higher in women despite better TIMI flow at the time of the patient's first angiography and less multi-vessel disease [Otten AM et al. *Eur Heart J Acute Cardiovasc Care* 2013]; perhaps related to more vasospasm during an acute MI [Thygesen K et al. *J Am Coll Cardiol* 2012]. Study of women with unstable and stable coronary disease has revealed that women have less calcification, more often diffuse epicardial disease without discrete luminal narrowing, and significant involvement of the coronary microvasculature circulation [Reynolds HR et al. *Circulation* 2011]. In contrast to men, women with ACS may have other exacerbating factors such as estrogen deficiency, and are more likely to have metabolic syndrome and diastolic dysfunction [Pizzi C, Bugiardini R. *Heart* 2010].

Figure 1. Women Delay Presenting to Hospital With MI




Reproduced from Diercks B et al. Gender differences in time to presentation for myocardial infarction before and after a national women's cardiovascular awareness campaign: A temporal analysis from the Can Rapid Risk Stratification of Unstable Angina Patients Suppress ADverse Outcomes with Early Implementation (CRUSADE) and the National Cardiovascular Data Registry Acute Coronary Treatment and Intervention Outcomes Network–Get with the Guidelines (NCDR ACTION Registry–GWTG). Am Heart J 2010;160(1):80. With permission from Elsevier.

A lower rate of obstructive atherosclerosis may have implications when diagnostic testing in women for cardiovascular disease [Shaw LJ et al. *J Am Coll Cardiol* 2009; *Circ Cardiovasc Imaging* 2010]. Exercise or bicycle testing, for example, is less useful in diagnosing women due to lower rates of obstructive epicardial disease [Montalescot G et al. *Eur Heart J* 2013]. Dr. Maas suggested use of coronary flow measurements during catheterization for diagnosis of diffuse obstructive atherosclerosis and computed tomography angiogram in the emergency room for diagnosis of ACS [Troung QA et al. *Circulation* 2013].

## Optimizing Outcomes in Patients With Hypertension

Written by Nicola Parry

Arthur Liqui-Lung, MD, Stichting Teaching Hospital, Willemstad, Curaçao, Netherlands Antilles, addressed the rising problem of hypertension and its complications, especially in black patients. He discussed strategies for maximizing blood pressure (BP) control and the current BP goals as recommended by 2013 European Society of Hypertension (ESH)–European Society of Cardiology (ESC) and Joint National Committee (JNC) 7 guidelines.

Hypertension is already a major global health challenge with the prevalence only expected to increase in the coming decades. Based on a pooled analysis of regional data, an estimated 972 million adults worldwide had hypertension in 2000 with a predicted increase by 60% to 1.56 billion by 2025 [Kearney PM et al. *Lancet* 2005]. To maximize the reduction in the long-term risk of death owing to cardiovascular consequences, prevention and control of hypertension will be critical. Even a 2-mm Hg reduction in systolic BP can lower mortality risk from ischemic heart disease and stroke by 7% and 10%, respectively [Lewington S et al. *Lancet* 2002].

Current guidelines indicate a target BP of <140/90 mm Hg for patients without diabetes mellitus, kidney disease, or cardiovascular disease, with lower targets for those with one or more of these conditions (Table 1). Despite knowledge on lifestyle interventions and availability of effective medications, even countries with enviable healthcare systems report low attainment of current BP targets. A 2004 European study demonstrated that as many as 80% of patients receiving therapy for hypertension fail to reach target BP goals of <140/90 mm Hg (Figure 1) [Wolf-Maier K et al. *Hypertension* 2004].

Table1. Current BP Guidelines

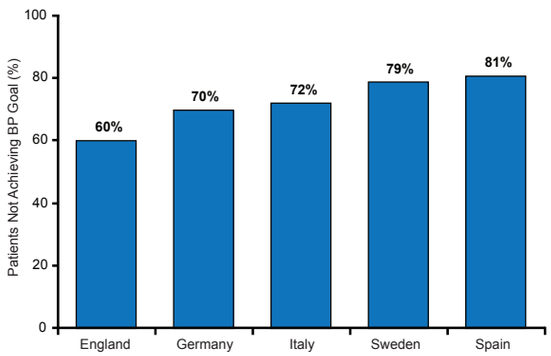
| | JNC 7[1] | ESH-ESC[2] |
|---|---|---|
| | BP Goal (mm Hg) | BP Goal (mm Hg) |
| Uncomplicated | <140/90 | 140/90 |
| Complicated | | |
| Diabetes mellitus | <130/80 | 140/<85 |
| Kidney disease | <130/80* | 135-140/80-85 |
| Other high risk (stroke, myocardial infarction) | <130/80 | 130-139/80-85 |

BP=blood pressure; ESC=European Society of Cardiology; ESH=European Society of Hypertension; JNC=Joint National Committee.

*Lower if proteinuria is >1 g/day.

[1]Chobanian AV et al. *Hypertension* 2003; [2]Mancia G et al. *J Hypertens* 2013

Figure 1. Failure to Achieve BP Goals in Europe




BP=blood pressure.

Source: Wolf-Maier K et al. *Hypertension* 2004.

Dr. Liqui-Lung highlighted that hypertension and its sequelae are more prevalent in black patients, providing an even greater challenge to regions like the Caribbean with a high proportion of patients with African ancestry [Flack JM et al. *Hypertension* 2010]. In addition, there are important differences regarding hypertension in blacks including, a greater role for hypertension in the development of