

## Gender disparity in the management and outcomes of cardiovascular risk factors in diabetic and hypertensive patients: A cross-cultural phenomenon

Cardiovascular disease (CVD) is the major cause of morbidity and mortality among the diabetic population and is substantially increased in the presence of hypertension.<sup>[1]</sup> Over the past decades advances have been made in the diagnosis and treatment of CVD, leading to decreased mortality from coronary heart disease (CHD) among non-diabetic men and women as well as among diabetic men.<sup>[2]</sup> However, diabetic women have not enjoyed the benefits of these advanced therapeutic options for CHD and mortality has increased among diabetic women over the past three decades, compared to diabetic men.<sup>[2]</sup> While women with diabetes have had higher burden of both traditional and non-traditional CVD risk factors, compared to men,<sup>[3-5]</sup> these facts have not explained the lack of decline, let alone the actual increase in CHD mortality among diabetic women over the past three decades.<sup>[2]</sup> Therefore, several studies have been conducted, including one by our group, to investigate whether differences in health care delivery would provide partial explanation for the poor control of CVD risk factors among diabetic women compared to men.<sup>[6-9]</sup> Our study was conducted in seven medical centers across four US cities and involved 2,789 diabetic men and women.<sup>[8]</sup> In our cohort, despite comparable age, BMI and percentage with hypertension, diabetic women tended to have higher hemoglobin A1C, LDL-cholesterol and systolic blood pressure (SBP), compared to men.<sup>[8]</sup> Women were also less likely to be referred for eye exam or be screened for nephropathy. Interestingly, there was significantly lower percentage of smoking among diabetic women compared to men; perhaps attesting to better health behavior among diabetic women.<sup>[8]</sup> Gender disparity was also observed in a cross-sectional analysis from a cohort of patients with diabetes sampled from 10 US-managed health care plans involving 1,315 women and 1,575 men with a history of CVD and 3,415 women and 2,516 men without a history of CVD.<sup>[6]</sup> Among patients with CVD, probabilities for not being in control for SBP and LDL-cholesterol were significantly higher for women compared to men. Authors concluded that in diabetic patients with CVD, poorer control of SBP and LDL-cholesterol for women may contribute to the sex disparity in CVD mortality trends. These data collectively attest to gender disparity in health care delivery and outcomes in developed countries with advanced health care technology and application of evidence-based medicine, thus prompting guidelines to specifically address CVD management among women.<sup>[10]</sup>

The accompanying study by Damanhori *et al.*,<sup>[11]</sup> from the Kingdom of Bahrain, that is composed of a group of small islands located in the Arabian Gulf with an approximate

population of 650,000, was conducted in a primary health care organization with a network of 20 health centers that provides health care including dispensing essential drugs. Despite availability of resources, women were less likely to receive essential medications that have been shown to reduce CVD morbidity and mortality such as angiotensin converting enzyme inhibitors and aspirin. These results from a Middle Eastern country parallel those findings from the US, albeit with an overall poorer control in the Bahraini population. Furthermore, these findings by Damanhori *et al.*,<sup>[11]</sup> also confirm the higher burden of CVD risk factors such as obesity, hypercholesterolemia and hyperuricemia among diabetic women compared to men. Collectively, these data indicate that gender disparity in diabetes care is a cross-cultural phenomenon and therefore efforts by international bodies such as the World Health Organization should be concerted to address the poor CVD risk factor-control among diabetic women, a rapidly growing and a particularly vulnerable population.

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