Chronic Kidney Disease in the Arab World: A Call for Action

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Key Words

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Abstract

Chronic kidney disease (CKD) is an emerging non-communicable disease worldwide. The Arab countries have a high prevalence of CKD risk factors, e.g. diabetes, obesity and hypertension. Unfortunately, the magnitude of CKD in the Arab world has not been studied well. This review presents the current data on CKD in the Arab world and proposes a call for action to address this rising epidemic.

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Much attention is now being directed to non-communicable diseases. As the world's population ages and the diabetes epidemic continues unabated, chronic kidney disease (CKD) is emerging as an important non-communicable disease worldwide [1]. The three very important risk factors for CKD – diabetes, hypertension and obesity – are highly prevalent in the Arab world, more so than perhaps anywhere else. However, the magnitude of CKD seems to have escaped the attention of policy makers and researchers insofar as this pertains to the 'Arab world'.

Progression of CKD to end-stage renal failure (ESRF) has tremendous human and economic implications. Mortality is as much as 17-fold higher in patients with

ESRF compared to age- and gender-matched healthy individuals, and the cost of dialysis or transplantation is frequently unaffordable to many in the absence of governmental programs. Little attention and limited resources are being allocated to CKD and/or its risk factors even though the Arab world comprises 313.9 million people in 23 countries and territories spanning the two major continents of Africa and Asia. The situation needs to change because the current data underestimates the magnitude of the problem, which, if fully realized, will pose a tremendous burden to the public health system in these countries.

Data available on the exact prevalence of various kidney diseases in the Arab world is very limited. In reviewing the recent literature, we found that there is no Arab country with up-to-date information on the epidemiology of CKD. Most of the data come from small studies of approximately 100 patients or less (table 1). Based on their size and other design considerations, data from these studies have limited generalizability.

Diabetes and hypertension are the top two causes of ESRF in seven of twelve Arab countries (table 1). Remarkably, Arab countries such as the UAE, Saudi Arabia, Bahrain and Kuwait, where the World Health Organization (WHO) estimates 'very high prevalence of diabetes' (in the 15–25% range), there is a lack of accurate data on the CKD prevalence. In contrast, the American Diabetes Association estimates the diabetes prevalence in the USA to be about 8.3%. The estimates for ESRF are a fraction of that reported in the USA where the incidence is 360 per

Table 1. Available data on the epidemiology of CKD and ESRF in the Arab world (data may date back as far as 1992 or be as recent as 2007)

Country	Incidence of CKD, pmp	Incidence of ESRF, pmp	Prevalence of ESRF, pmp	Leading cause of ESRF	Second leading cause of ESRF
Algeria	–	34	78.5	–	–
Egypt	–	74	375	Diabetes	Hypertension
Jordan	–	111	312	Diabetes	Hypertension
Kuwait	366	78	81	Diabetes	GN
Libya	–	200	30	–	–
Morocco	–	60	52	GN	IN
Oman	–	100	–	–	–
Saudi Arabia	–	136	434	Hypertension	Diabetes
Sudan	–	100	–	GN	Obstructive uropathy
Tunisia	–	159	–	Diabetes	Hypertension
UAE	–	74	–	GN	Diabetes
Qatar	–	122	480	GN	Diabetes

GN = Glomerulonephritis; IN = interstitial nephritis.

million population (pmp) and the prevalence is 1,626 pmp [2]. Unless the likelihood of developing ESRF is dramatically lower in the Arab world than that in western countries, these lower reported prevalence and incidence data in Arab countries most probably reflect underreporting and/or the lack of properly designed national renal registries. In addition, many patients with untreated and possibly undiagnosed ESRF are not counted. This could result in underestimating the incidence and prevalence of ESRF.

Diabetes, hypertension and obesity are powerful risk factors in the etiology of CKD. Extrapolations based on the epidemiology of these risk factors may provide some insights into the epidemiology of CKD. In 2007, according to the WHO, four out of the top five countries with diabetes were high-income countries from the Arab world [3, 4]. With the exception of Nauru, which had a prevalence of diabetes mellitus in its adult population of 30.7%, the UAE (19.5%), Saudi Arabia (16.7%), Bahrain (15.2%) and Kuwait (14.4%) represent focal points for diabetes. Table 2 depicts the estimated prevalence of diabetes in 2000 and the expected data in 2030 in the Arab countries and US.

Most individuals with diabetes in low- and middle-income countries are middle aged (45–64) and elderly (>65 years). In Jordan, Libya, Morocco and Oman, data shows that the prevalence of diabetes has increased from approximately 3% prior to 1980 to a current prevalence of 5–16% (prevalence exceeding 10% of the adult population) [5]. In Jordan, the leading cause of ESRF was reported to be diabetes (29.2%). In the UAE 23.3% of patients

Table 2. The estimated prevalence of diabetes in 2000 and the expected number in 2030 in the world, the USA and Arab countries for which information is available [4]

Country	2000	2030
World	171,000,000	366,000,000
USA	17,702,000	30,312,000
Arab World	7,814,000	22,157,000
Algeria	426,000	1,203,000
Bahrain	37,000	99,000
Comoros	4,000	15,000
Djibouti	7,000	9,000
Egypt	2,623,000	6,726,000
Iraq	668,000	2,009,000
Jordan	195,000	680,000
Kuwait	104,000	319,000
Lebanon	146,000	378,000
Libya	88,000	245,000
Mauritania	34,000	103,000
Morocco	427,000	1,138,000
Oman	113,000	343,000
Qatar	38,000	88,000
Saudi Arabia	890,000	2,523,000
Somalia	97,000	331,000
Sudan	447,000	1,277,000
Syria	627,000	2,313,000
Tunisia	166,000	388,000
UAE	350,000	684,000
Yemen	327,000	1,286,000

with ESRF had diabetes as the cause. Therefore, collectively, since 30% of individuals with diabetes develop kidney failure, it is likely that diabetic kidney disease is a significant, albeit relatively underreported, burden in the Arab world.

Likewise, the prevalence of hypertension, its level of public awareness and hypertension risk factors are poorly understood in the Arab world. Hypertension is both a cause and a complication of CKD since >50% of patients with CKD have hypertension (blood pressure >140/90 mm Hg). In addition, hypertension is a risk factor for progression of kidney disease and cardiovascular diseases. In the National Hypertension Project (NHP) in Egypt [6, 7], the national estimate of the prevalence of hypertension in Egyptians was 26.3%. Only 37.5% of the hypertensive individuals were aware of being hypertensive. Hypertension is also responsible for 28% of causes of ESRF in Egypt [8]. In Saudi Arabia, the prevalence of hypertension varied between different studies in part because there was variability in how hypertension was defined. In one study, the prevalence of hypertension in Saudi Arabia was 15.2% [9], while in another study, also by Al-Nozha et al. [10], in 2007 the prevalence of hypertension was 26.1%.

The reported prevalence of hypertension in the UAE and Syria has varied because of different criteria for defining hypertension. In 1999, the reported prevalence in the UAE was 36.6% [11]. In a cross-sectional community-based study in Al-Ain in the UAE, of 817 participants 20.8% had hypertension [12]. In 2007, Syrian investigators reported a 40.6% prevalence of hypertension, which was higher among men [13]. These disparate observations could be explained by small sample sizes and/or different definitions of hypertension. This is supported by a recent report of the under-diagnosis (33%) and under-treatment (76%) of hypertension in the UAE [14].

Obesity is also related to CKD epidemiology since obesity appears to be an important risk factor for CKD [16–20]. The prevalence of obesity has increased over the past 2 decades. Over 3,000 million adults worldwide are obese [21]. The prevalence of a body mass index of at least 35 among incident dialysis patients has increased by 64% over the past decade, and if trends continue 20% of all patients will initiate dialysis with this degree of obesity. In Syria, obesity was found to be 38.2%, with the prevalence in women nearly one and half times more than in men [13]. Obesity affects 16–50% of individuals with diabetes in the Arab world, 20–38% have hyperlipidemia, 24–46% have hypertension and, although data are incomplete, nephropathy and retinopathy rates appear to

be quite high [5, 22]. Moreover, in a review of obesity prevalence in the Arab world [23] it was concluded that one-third of Arabs are obese and women have particularly higher rates of obesity as defined by a body mass index of 30.

In summary, even though the data is limited, the evidence points to a high prevalence of three of the major risk factors for CKD in the Arab world, which implies that this population has a significant risk for developing CKD. Unfortunately, the lack of epidemiologic data on CKD is a key stumbling block to highlighting the importance of this problem among policy makers. On the other hand, it is important to mention the recent findings of the U.S. Preventive Services Task Force (USPSTF) that there is not enough evidence to show that screening healthy adults for CKD improves outcomes [24]. Additionally, it shows that the balance of benefits and harms cannot be determined, and subsequently, the screening of healthy adults with asymptomatic CKD is not advisable.

A Call for Action

There is an urgent need to conduct proper epidemiologic studies on CKD in the Arab world. Many Arab countries do have the resources and the public health infrastructure to do such work – Egypt, Saudi Arabia and the UAE being prime examples. Furthermore, screening programs in CKD are relatively inexpensive as we have demonstrated in Saudi Arabia [25] and elsewhere. We believe policy makers and clinicians should consider emphasizing CKD as a public health problem and devote resources to it especially since money is now being made available for research. This will bring Arab countries in line with other middle- to high-income nations. To this point, the budget for research in the Arab world is approximately 0.15% of GDP, compared with an average of 1.4% in the world and 2.5% in Europe. While we recognize that resources, lack of awareness, cultural and social issues may have contributed to the absence of studies on CKD in the Arab world, the past should not be a prologue to what must happen in the future.

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