

## ***Renal Data from the Arab World***

### **Prevalence of Patients with End-Stage Renal Disease on Dialysis in the West Bank, Palestine**

Mohammed I. Khader, Shehab Snouber, Abdallah Alkhatib, Zaher Nazzal, Anwar Dudin

An-Najah National University, Nablus, Palestine

**ABSTRACT.** This study was conducted to determine the point prevalence of patients with end-stage renal disease (ESRD) on dialysis in the West Bank, Palestine. As part of this study, the following parameters were studied: District, gender, age and presumed cause. This cross-sectional study was undertaken during the period 26–30 December 2010 at all dialysis units in the West Bank, and included all cases of ESRD on dialysis. The total prevalence of patients with ESRD on dialysis during the study period was 240.3 per million population (PMP). The highest prevalence was seen in Jericho city. There were 57.7% males and 42.4% females in the study. The majority of patients (62.3%) were living in villages, while 28.8% were living in cities and 8.9% were living in refugee camps. Most of the patients (45%) were aged between 45 and 64 years. The vast majority of patients were either diabetic (22.5%) or hypertensive (11.1%) or both at the same time (10.6%). There were a considerable number of patients in whom the cause was undetermined (27.6%). The majority of recorded cases of congenital causes were from the Hebron, Jenin and Tubas districts. The prevalence of ESRD noted in our study is comparable with other regional countries but far below the rate recorded in industrialized countries. In the Palestinian territories, there is a general lack of national statistics and surveys, particularly in the public health section. Increased efforts and awareness should be focused on the prevention and treatment of diabetes mellitus and hypertension as they are the main causes of ESRD. There should also be an additional enhancement and implementation of strategies for the registration of data in order to conduct periodic comparisons and analytical studies to improve the management and quality of life of ESRD patients.

#### **Introduction**

Chronic kidney disease (CKD) is characterized by an irreversible deterioration of renal

Correspondence to:

Dr. Mohammed Khader,  
An-Najah National University,  
Nablus, Palestine  
E-mail: [m\\_khader87@yahoo.com](mailto:m_khader87@yahoo.com)

function that gradually progresses to end-stage renal disease (ESRD). The definition of ESRD is included under stage-5 of the National Kidney Foundation Kidney Disease Outcomes Quality and refers to individuals with an estimated glomerular filtration rate below 15 mL/min/1.73 m<sup>2</sup> body surface area,<sup>1</sup> resulting in the deterioration of kidney function that is no longer adequate to sustain life without the use of renal replacement therapy (RRT) in the

form of dialysis or transplantation.

The incidence and prevalence of ESRD continues to grow worldwide. According to data collected from 120 countries using dialysis programs, at the end of 2005, about 1,900,000 people were receiving RRT.<sup>2</sup>

The aim of this study was to determine the point prevalence of patients with ESRD on dialysis in the West Bank, Palestine, in December 2010, and to study the relationship with age, gender and place of residence (city, village, refugee camp). In addition, this study assessed the presumed causes of ESRD in these patients.

Ninety percent of the patients with ESRD live in high-income countries, where the average gross income is in excess of US \$ 10,000 per capita.<sup>3</sup> The prevalence of ESRD in the United States of America (USA) and the European Union is 1500 and about 800 per million population (PMP), respectively.<sup>3-5</sup> In developing countries, the figures vary from less than 100 PMP in sub-Saharan Africa and India to about 330 PMP in Jordan, 360 PMP in Iran and 600 PMP in Saudi Arabia.<sup>3-5</sup>

The rapid increase in the prevalence of ESRD and the enormous cost of treatment necessitate an urgent approach to the implementation of strategies to prevent the further development and progression of ESRD, especially in the developing world. Detailed chronological changes in the prevalence of ESRD may sharpen the focus on its prevention.<sup>5</sup>

At the time of the study, there were 604 patients undergoing dialysis across nine dialysis units in the West Bank (pediatric patients are

dialyzed in the Augusta Victoria Hospital, Jerusalem). Based on the fact that there are no satisfactory or detailed studies about the prevalence of ESRD patients on dialysis in the West Bank, this study was conducted to build a foundation for future research. This study will allow further studies on period prevalence through comparison of the efficacy of services provided or the survival rate of patients using our results of point prevalence of ESRD on dialysis in the West Bank, Palestine.

### Materials and Methods

A cross-sectional study was carried out across all dialysis units in the West Bank, and included all cases of ESRD undergoing dialysis during the period 20–30 December 2010. We retrieved the demographic data, age, gender, cause of ESRD and residence of the study patients from the patients' hospital charts. We also collated related information about the distribution of the population from the Palestinian Central Bureau of Statistics and Ministry of Health.

All analyses were conducted using the Social Package of Statistical Sciences software version 11.0, SPSS Inc., Chicago, USA, and Microsoft Office Excel 2007. Tables and figures were used to describe categorical variables.

Informed consent was obtained from The Ministry of Health to retrieve information about the patients from the dialysis units. The privacy of patients was assured by taking their data anonymously and approval was obtained from

Table 1. Distribution of the study dialysis patients according to district.

Valid	Total no. of population <sup>6</sup>	Frequency of patients	Prevalence (PMP)
Nablus	340,117	105	308.7
Hebron	600,364	147	244.8
Ramallah and Al-Beira	301,296	75	248.9
Jenin and Tubas	328,766	96	292.0
Tulkarem	165,791	56	337.7
Bethlehem	188,880	50	264.7
Qalqeliya	97,447	38	389.9
Salfit	63,148	17	269.2
Jericho	45,433	20	440.2
Total	2,513,283	604	240.3

PMP: Per million population

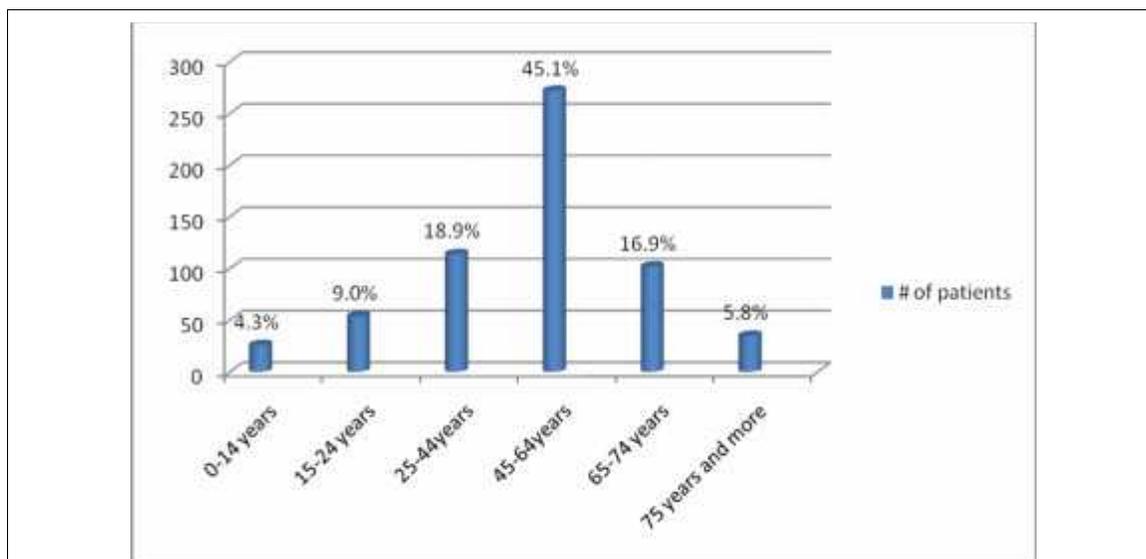


Figure 1. Distribution of dialysis patients according to age.

the Institutional Review Board committee at the An-Najah National University.

There is no conflict with anyone for full disclosure.

### Results

The total number of patients on dialysis in the West Bank at the time of study was 604, with a prevalence rate of 240.3 PMP. The distribution according to district is summarized in Table 1. Males contributed 57.7% of the pa-

tients and females contributed 42.4% of the patients. The majority of patients (62.3%) were living in villages while 28.8% of the patients were living in cities and 8.9% were living in refugee camps.

The distribution of the study patients according to age is summarized in Figure 1 and according to main causes of ESRD is summarized in Figure 2. It is worth noting that the percentage of documented congenital causes in the Hebron district was 12.2%; likewise, the percentage of documented congenital causes in

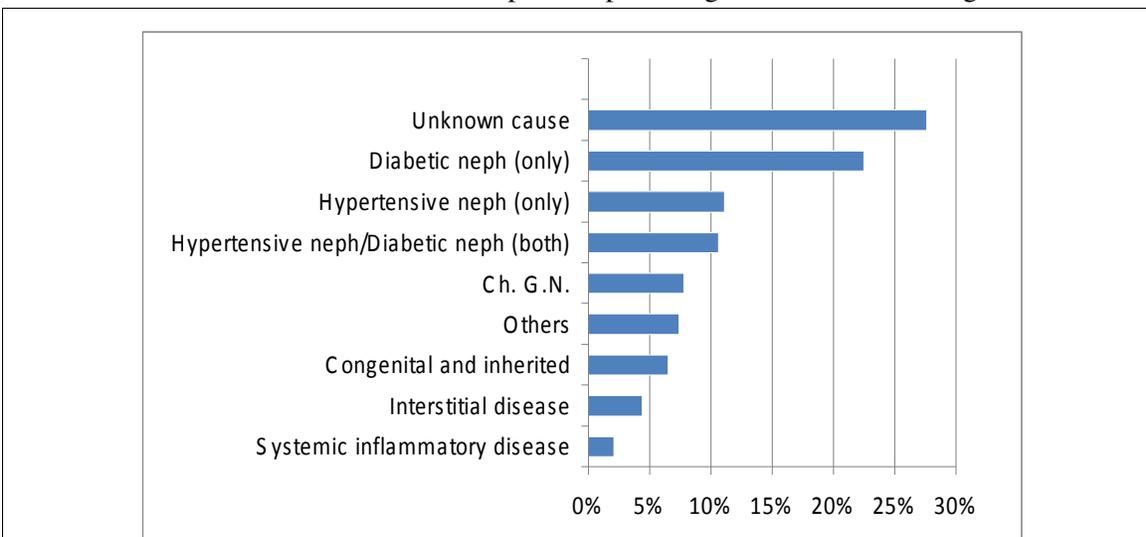


Figure 2. Distribution of dialysis patients according to the main causes of ESRD.

Neph: Nephropathy, Ch: Chronic, GN: Glomerulonephritis

Jenin and Tubas was 8.3%.

### Discussion

Providing dialysis services and programs depends on both the medical knowledge and the socio-economic status of a given nation. It is clear that economic constrains may limit the number of patients starting RRT, which explains why the numbers vary from country to country.

The most crucial aspect of this registry is not merely to collect data but to analyze, interpret and apply the data collected. It is also important for undertaking periodic comparisons and analytical studies to improve the management and quality of life of these patients. A remarkable example of this is evident in the comparison of data from the United States Renal Data System with that from Lombardy and Japan, where a higher mortality rate was documented among the dialysis patients in the USA, which was associated with a shorter dialysis time.<sup>7,8</sup> This led to a prolongation of dialysis sessions in the USA.

In the Palestinian territories, a lack of general national statistics and surveys, particularly in the public health section, means that researchers lack statistical data to analyze the prevalence of different illnesses, to assess the significance of the illness as well as its social, psychological and economical impact. This encouraged us to study diseases and make recommendations to enable the public authorities to create a foundation for future research. Some promising efforts to enhance the documentation of data have begun. For example, the dialysis unit in Nablus district has started to computerize patients' data, which is an im-

portant starting step.

The prevalence of ESRD in the West Bank (240.3 PMP) is not very different from that in the regional countries (312 PMP in the Middle East as a whole in 2009<sup>9</sup>), perhaps as a result of similar genetic, social, economic and environmental factors. However, it is still far below the high prevalence rate recorded in Western countries (581 PMP in Europe as a whole in 2009<sup>9</sup> and 1500 PMP in the USA<sup>10</sup>). This may be attributed to economic status and demographic distribution in these countries, which have a higher percentage of older people. Additionally, this high prevalence is largely due to longer survival made possible by RRT, which in turn is dependent on health-care expenditures and economic strength, resulting in more patients living on dialysis in industrialized countries.

The highest prevalence of ESRD in the West Bank was in Jericho district, in which 50% of the patients were diabetic, hypertensive or both. The cause of this high prevalence remains unclear, but may be attributed to the increasing number of families who have recently moved to that region as a large number of Palestinian National Authority Agencies have their headquarters there. Moreover, the distribution of residence, in which 30% live in the refugee camps, 35% in the villages and 35% in the city, is logical when considering the distribution of population in this district; 19,991 live in the city, 14,862 live in villages and 11,262 live in refugee camps.<sup>6</sup>

Among the causes leading to ESRD in the West Bank, the most frequent were diabetes mellitus and hypertension (making about 44% of cases). This follows similar data from around the world (Table 2)<sup>11</sup> and reflects the

Table 2. Common causes of chronic renal failure among the study patients.

Disease	Proportion of the total cases
Congenital and inherited	5%
Renal artery stenosis	5%
Hypertension	5–25%
Glomerular disease	10–20%
Interstitial disease	5–15%
Systemic inflammatory disease	5%
Diabetes mellitus	20–40%
Unknown cause	5–20%

catastrophic sequelae of these two silent killers. This mandates a need for increasing awareness and efforts for their prevention and treatment.

As noted earlier, majority of the study patients (62.3%) were living in villages away from the dialysis units, which necessitates new plans and projects to deal with their treatment, such as facilitation of travel for patients and their attendants and to educate and train both about day-to-day care when they are away from the hospital. This further necessitates the need for a greater focus on palliative care in the home, such as home dialysis.

There was no significant difference in the distribution of presumed cause in respect to gender, other than cases of Alport's syndrome and neoplasms, where all affected patients were male. Alport's syndrome is an X-linked recessive inherited disease and, hence, it is logical to see it in male patients. It is not clear why urinary tract neoplasms in general are more common in males than in females.

It is important to note that the majority of recorded cases of congenital causes were from the Hebron (mainly familial nephrolithiasis), Jenin and Tubas districts (mainly adult polycystic kidney disease). The reasons behind these observations are not clear and may encourage us to look at them closely, possibly due to the higher percent of parent consanguinity in these districts.

A further remarkable finding is that there were no recorded cases of renal artery stenosis. This may be due to poor diagnostic tools rather than absence of such patients in the West Bank, and is worth further research. Furthermore, the higher percentage of undetermined causes (27.6%), which is slightly higher than the range worldwide (5–20%<sup>11</sup>), points to the necessity of improved pre-ESRD work-up.

In conclusion, the prevalence of ESRD patients on dialysis in the West Bank, Palestine, is comparable with that of adjacent countries, but is still far below the high prevalence rate recorded in Western countries. In the Palestinian territories, there is a lack of general national statistics and surveys, particularly in the public health sector, as a result of poor registry and

documentation of data. More efforts are required to enhance and implement strategies for the registration of data due to its importance in conducting periodic comparisons and analytical studies to improve the management and quality of life of ESRD patients. In addition, these results will provide a foundation for future researchers to undertake further studies such as period prevalence, with comparisons of the efficacy of the services provided and the survival rate of patients.

Our study is subject to some limitations, including poor proper registry, which made collecting information about patients, especially about renal transplantation, extremely difficult and rendered much of the information insufficient and unsatisfactory. The limited timeframe for the study was also a factor. Both these limitations forced us to focus only on ESRD patients on dialysis.

## References

1. Kopple JD. National kidney foundation K/DOQI clinical practice guidelines for nutrition in chronic renal failure. *Am J Kidney Dis* 2001;37(1 Suppl 2):S66-7.
2. Grassmann A, Gioberge S, Moeller S, Brown G. End-stage renal disease: Global demographics in 2005 and observed trends. *Artif Organs* 2006;30:895-7.
3. Barsoum RS. Chronic kidney disease in the developing world. *N Engl J Med* 2006;354:997-9.
4. Mahdavi-Mazdeh M, Heidary Rouchi A, Norouzi S, Aghighi M, Rajolani H, Ahrabi S. Renal replacement therapy in Iran. *Urol J* 2007;4:66-70.
5. Aghighi M, Mahdavi-Mazdeh M, Zamyadi M, Heidary Rouchi A, Rajolani H, Nourozi S. Changing Epidemiology of End-Stage Renal Disease in Last 10 Years in Iran. *Iran J Kidney Dis* 2009;3:192-6.
6. Population Projections. Localities in selected district Governorate by Type of Locality and Population Estimates for Selected Years. Available from: <http://pcbs.gov.ps/site/803/default.aspx>. [Last accessed on 2010 Dec 30].
7. Marcelli D, Stannard D, Conte F, Held PJ, Locatelli F, Port FK. ESRD patient mortality with adjustment for comorbid conditions in Lombardy (Italy) versus the United States. *Kidney*

- Int 1996;50:1013-8.
8. Locatelli F, Manzoni C. Duration of dialysis session-was Hegal right? *Nephrol Dial Transplant* 1999;14:560-3.
  9. Najafi I. Peritoneal dialysis in Iran and the Middle East. *Perit Dial Int* 2009;29 Suppl 2:217-21.
  10. Mahdavi-Mazdeh M, Zamyadi M, Nafar M. Assessment of management and treatment responses in haemodialysis patients from Tehran province, Iran. *Nephrol Dial Transplant* 2008; 23:288-93.
  11. Boon N, Colledge N, Walker B. Davidson's principles and practice of medicine. 20<sup>th</sup> ed. USA: Elsevier; 2006. p. 485-6.

