

*Original article*

# Hypertensive Nephropathy as a Cause of End Stage Renal Disease: Report from 37 Hemodialysis Centers in Libya.

Eman Gusbi<sup>1</sup>, Nada Elgriw<sup>1</sup>, Nabil Enattah<sup>1</sup>, Adam Elzeighed<sup>1</sup>

<sup>1</sup> Biotechnology Research Center Tripoli Libya

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## Abstract:

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**Background:** Hypertension is a cardinal feature of end stage renal disease (ESRD),hypertensive nephropathy is the primary cause of ESRD for nearly 30% of patients, and the prevalence of hypertension is more than 85% in patientswith ESRD, data on the hypertensive nephropathy in Libya, and particularly among hemodialysis patients, are scarce.

**Aim:**

This study was conducted to studyhypertensions a cause ofESRDin thesespecific health-care setting at 37 dialysis centers in Libya as well as demographic features and etiologic factors for hypertensive nephropathy.

**Patients and Methods:** The present cross-sectional study included a total of 2358 patients at 37 dialysis centers in different cities across the three main regions of Libya (Western, Eastern, and Southern regions), the majority of them from west. There were 902 (38.3%) female and 1456 (61.7%) male with mean age  $51.30 \pm 16.30$  years.

**Results:** Overall of the study population had renal failure but the causes of renal failure differ, 598 (25.4%) of patients due to hypertension, 560 (23.7%) due to diabetes mellitus,Blood pressure and diabetes in 305 (12.9%), blood pressure and glomerular disease 16 (0.7%), blood pressure and urinary tract obstruction 21 (0.9%), genetic diseases 193 (8.2%), glomerular diseases 141 (6.0%), inflammation of the tract 8 (0.3%), obstruction of the urinary tract 95 (4.0%), unclear reasons 421 (17.9%). All these risk factors were diverse underlying causes of end-stage renal disease in these patients.

**Conclusions:**

The present study showed that the highest number of renal failure patients due to hypertension and diabetes also the present study showed that the male sex is more affected by hypertensive nephropathy and the overall frequency of nephropathy was higher in western region.

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**Key words:** Diabetes mellitus, Hypertension, End Stage Renal disease.

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**Citation:** Gusbi E, Elgriw N, Enattah N, Elzeighed A. Hypertensive Nephropathy as a Cause of End Stage Renal Disease: Report from 37 Hemodialysis Centers in Libya. 2021;15(2):1-2. <https://doi.org/10.54361/ljmr.15201>

**Received:** 21/10/21; **accepted:** 30/10/21; **published:** 31/12/21

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## Introduction:

in these groups rates of ESRD continue to rise. These differences in healthcare may be due to increasing rates of obesity and type 2 diabetes in youth[9].

One of the important organs that are involved in diabetes are kidneys. In most parts of the world, diabetes is the most common cause of end-stage renal disease (ESRD). These increase morbidity and mortality in diabetic patients due to increase involvement of other organs both directly and indirectly. 20 to 30% of diabetic patient have diabetic nephropathy in type 1 and type 2.

Therefore, prevention and early diagnosis and treatment of diabetic nephropathy is important, since a significant decrease in life expectancy of patients happens with untreated diabetic nephropathy, because of increasing industrialization of societies, increased immobility and changes in diet and lifestyle and increasing prevalence of obesity, insulin resistance and increasing prevalence of type 2 diabetes.

Since many of the classic symptoms that occur in type 2 diabetes and not occur in type 1 diabetes. Therefore, it's very important the screening methods for kidney involvement in type 2 diabetes patients.[10]

Data on the hypertensive nephropathy in Libya, and particularly among hemodialysis patients, are scarce. The aim of this study was to reviewed the demographic features as well as the etiologic factors in this specific health-care setting at 37 dialysis centers in Libya and to investigate the risk factors for hypertensive nephropathy.

Hypertension is intertwined (coiled) with chronic kidney disease (CKD). The prevalence of hypertension increases inexorably when the endogenous kidney function declines, it's a major feature of end-stage renal disease (ESRD). Hypertensive nephropathy is the primary cause of ESRD for nearly 30% of patients, and the predominance of hypertension is more than 85% in new patients with ESRD[1].

Over the last decade, different kinds of glomerulonephritis (GN) were the leading causes of CKD in the world, too. However, possibly due to lifestyle changes and increasing prevalence of obesity, diabetes and hypertension and because of more available aggressive treatment of GN, it is well established that diabetes and hypertension are now the primary causes of CKD in developed countries[2-6].

There is significant increase in the incidence and prevalence of diabetes mellitus

throughout the world especially, type 2 diabetes. This overall increase in the number of people with diabetes lead to increase in one of the most frequent complications of both types of diabetes which is development of diabetic kidney disease (DKD) [7].

DKD is the main reason of end-stage renal disease (ESRD), accounting for approximately 50% of cases in the developed world. Although over the past few years the incidence rates for ESRD attributable to DKD have stabilized[8], differences remain in high-risk subgroups such as middle-aged African Americans, Native Americans, and Hispanics,

### Patients and methods

These patients file records correspond to all chronic hemodialysis patients in these dialysis centers, demographic, clinical, pathological information including: sex, age at diagnosis, causes of renal failure, viral examination, residence and dialysis center were extracted from medical file records, and all these patients were dialyzed about 2 or 3 times per a week,

### Statistical analysis:

compared using Chi-square test and fisher-exact test if appropriate. Quantitative data were compared using student T test. A p value of < 0.05 was considered statistically significant.

### Ethical considerations:

Data collection tool was anonymous, and data confidentiality was maintained throughout the study.

### Results:

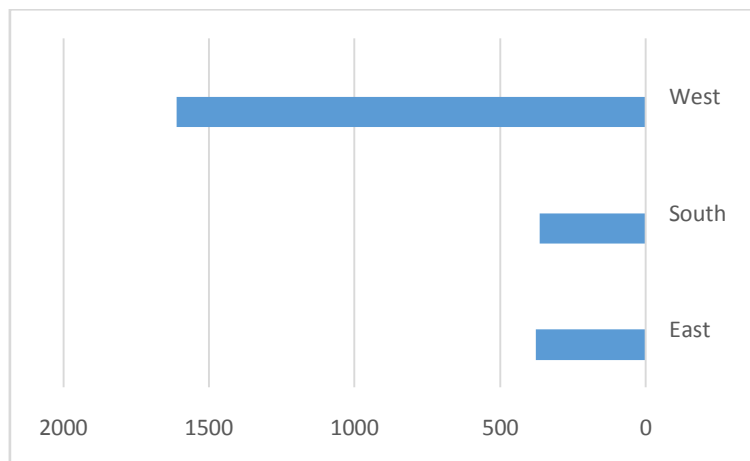
region, 379 (16.1%) patients from east region, 366 (15.5%) from south region (Figure 1).

The study was a descriptive, cross-sectional type, included a total of 2358 patients at 37 dialysis centers in different cities across the three main regions of Libya (Western, Eastern, and Southern regions), the majority of them from west. There were 902 (38.3%) female and 1456 (61.7%) male with mean age  $51.30 \pm 16.30$  years.

Collected data was sorted, coded and analyzed by SPSS program version [20]. Descriptive statistics including frequency, percentage and mean  $\pm$  standard deviation, were obtained for all variables as appropriate. Categorical data were

Ethical approval was conducted in accordance with the ethical principles of Helsinki Declaration. The protocol was approved by the Biotechnology Research Center Ethical Committee ( ).

This study comprises 2358 patients with end stage renal disease from three regions of Libya, 1613 (68.4%) patients from west



**Figure 1: Distribution of end stage renal disease (ESRD).**

(0.9%), genetic diseases 193 (8.2%), glomerular diseases 141 (6.0%), inflammation of the tract 8 (0.3%), obstruction of the urinary tract 95 (4.0%), unclear reasons 421 (17.9%). All these risk factors were diverse underlying causes of end-stage renal disease in these patients (Table 1).

Overall of the study population had renal failure but the causes of renal failure differ, 598 (25.4%) of patients due to hypertension, 560 (23.7%) due to diabetes mellitus, Blood pressure and diabetes in 305 (12.9%), blood pressure and glomerular disease 16 (0.7%), blood pressure and urinary tract obstruction 21

**Table 1: comparison of demographic features of patients with end- stage renal disease.**

Characteristics	All patients( n= 2358)	%
<b>Gender</b>		
<b>Male</b>	1456	61.7%
<b>Female</b>	902	38.3%
<b>Mean age ± SD (year)</b>	51.30 ± 16.30	
<b>Etiology of renal failure</b>		
<b>Hypertension</b>	598	25.4%
<b>Hypertension and Diabetes</b>	305	12.9%
<b>Hypertension and Glomerular disease</b>	16	0.7%
<b>Hypertension and urinary tract obstruction</b>	21	0.9%
<b>Diabetes mellitus</b>	560	23.7%
<b>Glomerular diseases</b>	141	6.0%
<b>Inflammation of the tract</b>	8	0.3%
<b>Obstruction of urinary tract</b>	95	4.0%
<b>Genetic diseases</b>	193	8.2%
<b>Unclear etiology</b>	421	17.9%

## Discussion:

determining the primary causes of CKD is not possible.

Renal biopsy is also not helpful and it cannot determine the cause of CKD at the end-stage of the disease. Regardless of the causes of CKD, histologic findings of kidney biopsy at the late stage of CKD are glomerulosclerosis, tubular atrophy and interstitial fibrosis and therefore renal biopsy is not helpful. In addition, in most of the patients with CKD, the sizes of kidneys are gradually decreased and kidney biopsy is not possible at the end stage. It is associated with increment risk and therefore kidney biopsy not recommended [17],[18].

## Conclusions:

about the benefits of early identification of the disease and subsequent kidney protection through appropriate interventions<sup>19</sup>.

The present study showed that the highest number of renal failure patients due to hypertension and diabetes also The present study showed that the male sex is more affected by hypertensive nephropathy and the overall frequency of nephropathy was higher in western region<sup>19</sup>.

## Disclaimer

The article has not been previously presented or published, and is not part of a thesis project.

## Conflict of Interest

There are no financial, personal, or professional conflicts of interest to declare.

Hypertensive nephrosclerosis and diabetic nephropathy were the most common causes of ESRD<sup>11,12,13</sup>, however in the significant number of patients (n=421, 17.9%), the causes of ESRD were unknown [13].

The results of other studies which have done in Iran, for example Haghghiet al. in 2002 <sup>14</sup>, Malekmakanet al. in 2009 <sup>15</sup> and Salahi et al. in 2004 <sup>16</sup>were also similar.

In some developing countries like Iran, the significant percent of patients with CKD are presented to the nephrologist with the severe symptoms of uremia and late stage of the disease. Unfortunately, at this time,

Although the hypertensive nephrosclerosis and diabetic nephropathy are also the most common causes of ESRD in developing countries, however, the causes of ESRD in the significant percent of patients in developing countries are still unknown possibly because of unawareness of patients with CKD and late referral of patients with CKD to the nephrologists, and therefore everyone with risk factors of CKD such as high blood pressure, diabetes mellitus, metabolic syndrome, family history of CKD and proteinuria have to be educated

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