

## Prevalence of End Stage Renal Disease in Menoufia Governorate

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**Abstract: Background:** End stage renal disease (ESRD) has become a worldwide health concern. In developed countries there is electronic data registry which allows easy statistical analysis and determination of the size of the problem for future planes. In developing countries there is no data registry and only scarce data were available about epidemiology of dialysis patients. **Aim of this work:** To study the prevalence of end stage renal disease in Menoufia Governorate. **Methods:** A questionnaire was conducted on dialysis units in five districts in Menoufia governorate chosen by simple random sample during the year 2013 focusing on demographic data, vascular access, hepatitis C status and causes of ESRD. Due to the frequency of renal dialysis (3 times per week) the patients always seek the nearby center, so these patients almost represent all patients in these districts. **Results:** The prevalence rate of end stage renal disease in Menoufia Governorate was 330 patients per million populations (pmp). The mean age was 52.45±14.12 years, 52.4 % male and 47.6 female. The main known cause of ESRD was hypertension (31.1 %), Diabetic nephropathy (DN) (15.9 %) while the unknown causes represent 20.5 %. The prevalence of hepatitis C was found to be 38.6 %. **Conclusion:** In Menoufia governorate there is a high prevalence rate of end stage renal disease which. Hypertension and diabetes constitute the major known causes. Unified system of electronic data registry should be started in each governorate to constitute the National Egyptian data registry.

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### 1. Introduction:

End-stage renal disease (ESRD) has become a public health concern worldwide as the total number of ESRD patients requiring renal replacement therapy has been growing drastically (1). Chronic kidney disease (CKD) is at least 3-4 times more frequent in Africa than in developed countries (2). Patient registry and a statistical evaluation of patients with ESRD is useful to clarify the characteristics of ESRD patients and dialysis therapy, as well as the complications or results based on scientific evidence, to improve the quality of dialysis therapy and provide socioeconomic health administration information for a future health plan (3).

According to the United States Renal Data System annual report 2011 (USRDS) the prevalence of ESRD varies worldwide, it can be high as in Taiwan 2447 patients per million populations (pmp), Japan 2205 pmp, and United States 1811 pmp and it can be low as in Philippines 110 pmp, Bangladesh 140 pmp and Russia 173 pmp(4). In developing countries like Egypt, there is an increase in prevalence and incidence of ESRD exerting a great burden on health system.

The prevalence of ESRD in Egypt increased from 225 (pmp) in 1996 to 483 pmp in 2004 (5). The main cause of ESRD in Egypt is hypertension followed by diabetes and still unknown causes represent about 15%

(5). The main problem in developing countries is lack and inaccuracy of data registry. Also there are no available epidemiological reports for different parts of the country.

In Menoufia governorate there is no peritoneal dialysis or transplant program and hemodialysis represent the main mode of treatment for ESRD. Although hemodialysis was initiated more than 3 decades in Menoufia governorate there is no reports depicted epidemiological characteristics of this group of patients in this area of the country. Menoufia is considered a rural region lying in delta area of Egypt.

The aim of this study is to describe the prevalence rate and etiology of ESRD in Menoufia governorate using a standardized epidemiological survey study.

### 2. Patients and Methods:

The protocol for this study followed the ethical standards and approved by the ethical committee of our institution and all subjects gave informed consent to participate in this study.

Five districts were chosen by simple random sample of Menoufia governorate and all the patients in the renal dialysis center in each district were involved in our study. Due to the frequency of renal dialysis (3 times per week) the patients always seek the nearby

center, so these patients almost represent all patients in these districts.

We conducted a questionnaire in hemodialysis units in these districts in Menoufia governorate from May 2013 to October 2013.

A questionnaire was designed focusing on the following data: demographics, etiology of ESRD, hemodialysis history, hepatitis C, hepatitis B and AIDS status.

The total population of these districts was 2,287,266 out of them 765 had end stage renal disease.

All patients were offered regular hemodialysis 3 times per week, each session 4 hours. The diagnosis of hypertension as a cause of ESRD was made when there is long standing hypertension before the development of ESRD with no evidence suggestive of other diagnosis.

The diagnosis of diabetic nephropathy was made when there is long standing diabetes with proteinuria and associated with diabetic retinopathy.

Lupus nephritis was diagnosed when there is a history or laboratory data suggestive of systemic lupus with kidney affection or biopsy proven kidney involvement of lupus nephritis.

#### Statistical Evaluation:

Data were collected, tabulated, statistically analyzed by computer using SPSS version 16, two types of statistics were done:

#### 1-Descriptive statistics:

Quantitative data are expressed to measure the central tendency of data and diversion around the mean, mean (x) and standard deviation (SD).

Qualitative data expressed in number and percentage.

2- Analytic statistics: One sample t test was used to compare between one group of quantitative data and their corresponding standards.

P value > 0.05 was considered statistically non significant.

P value ≤ 0.05 was considered statistically significant.

P value ≤ 0.001 was considered statistically highly significant.

### 3. Results:

A total of 765 patients were included in this study. The total population of districts included in this study was 2,287,266 according to Menoufia governorate 2013 census.

Accordingly the hemodialysis prevalence rate is 330 pmp. Unfortunately we do not have annual data so we could not calculate incidence rate.

Table 1 showed Socio-demographic data of the end stage renal disease patients. The mean age of the populations having end stage renal disease was

52.45±14.12. 52.4 % were males, 89.9 % were married and 45.1 % don't work.

Figure 1 showed the different causes of ESRD.

Hypertension represents 31.1%, diabetic nephropathy 15.9%, obstructive uropathy 9.9%, analgesic nephropathy 7.4%, chronic pyelonephritis 5.5%, gout 3.2%, bilharziasis 2.9%, lupus nephritis 2% polycystic kidney diseases 1.6% of causes of end stage renal disease.

There are 20.5 % of patients with ESRD with unknown etiology.

Figure 2 and table 2 showed the prevalence of HCV, HBV, and AIDS among patients on regular hemodialysis 38.6% of the end stage renal disease patients had HCV, 2.2% of the end stage renal disease had HBV, and 0.14% of the end stage renal disease had AIDS.

Table 3 showed Hemodialysis history of the end stage renal disease patients 88.6% of them use bicarbonate as a dialysate, 88% had vascular access through AV fistula, 40.4% using dialyzer with surface area 1.3, the mean duration of dialysis was 4 years, frequency of dialysis was 3 per week, the mean dry body weight was 72.57 and the mean of heparin dose 3564.45.

**Table (1): Socio-demographic data of the end stage renal disease**

Socio-demographic data	No (765)	%
Age	X ±SD 52.45±14.12	Range 14-86
Gender		
Male	401	52.4
Female	364	47.6
Marital state		
Married	687	89.9
Single	67	8.7
Widow or divorced	11	1.4
Occupation		
Not work	345	45.1
Worker	214	28.0
Employee	177	23.1
Professional	29	3.8

**Table (2): HCV, HBV and AIDS prevalence among the end stage renal disease patients.**

Parameter	No (765)	%
HCV		
Negative	470	61.4
Positive	295	38.6
HBV		
Negative	748	97.8
Positive	17	2.2
AIDS		
Negative	764	99.86
Positive	1	0.14

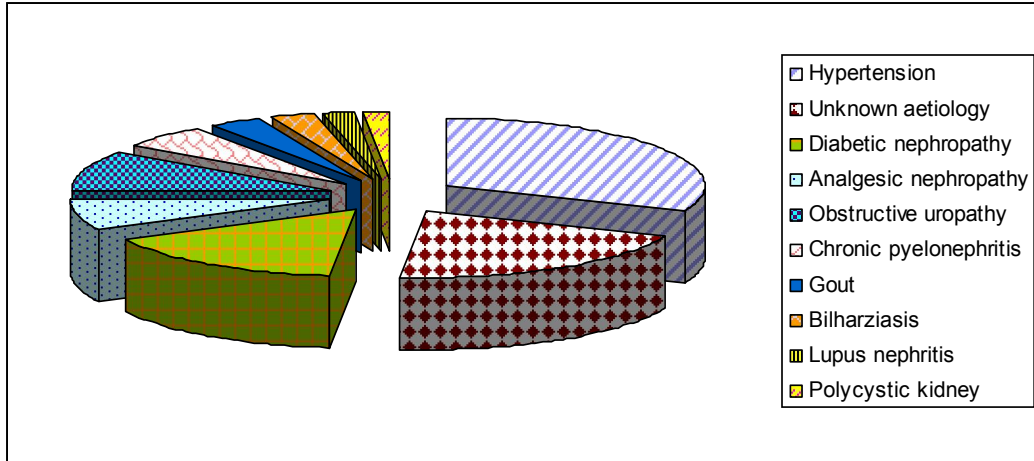


Figure (1): Different causes of end stage renal disease.

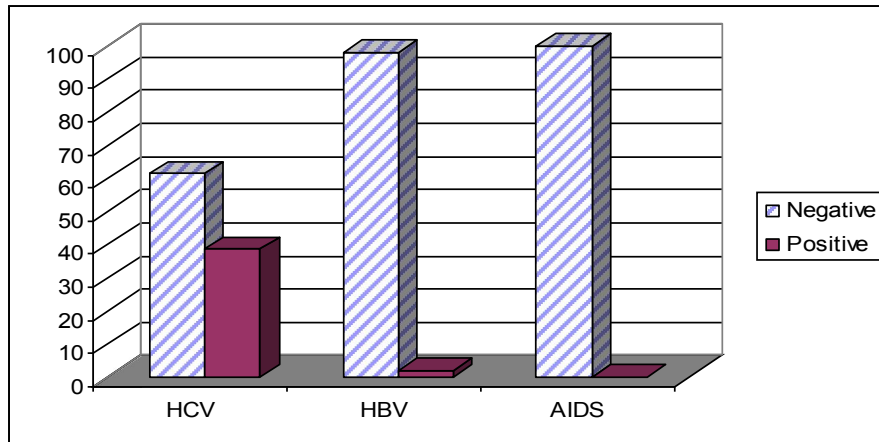


Figure (2): HCV, HBV and AIDS prevalence among the end stage renal disease patients.

Table (3): Hemodialysis history of the end stage renal disease patients.

Hemodialysis history	No(765)	%
Dialysate		
Acetate	87	11.4
Bicarbonate	678	88.6
Vascular access		
AV fistula	673	88.0
Catheter	92	12.0
Machine		
gampro	26	3.4
Fersenius	739	96.6
Dialyzer surface area		
1.3	309	40.4
1.4	19	2.5
1.6	86	11.2
1.7	253	33.1
2.1	98	12.8
Duration of dialysis	4.00±0.00	4-4
Frequency of dialysis	3/week	3-3
Dry body weight	72.57±13.56	3-116
Heparin dose	3564.45±885.45	300-5000

4. Discussion:

The incidence of ESRD requiring renal replacement therapy is steadily increasing and poses a tremendous burden on health care budget even in developed countries (6)

In our study the prevalence of ESRD patients on regular hemodialysis is 0.033% (330pmp).

In EL Minia governorate, one of Upper Egypt governorates the prevalence was 308 pmp (7)

Worldwide the prevalence differs greatly. According USRDS the highest prevalence was found in Taiwan with 2447 pmp and the lowest prevalence was in Philippines 110 pmp. In United States the prevalence was 1811 pmp. (4).

Low prevalence in Egypt may be due to lack of registration and documentation programs for end stage renal disease patients and also due to short life expectancy for these patients in Egypt.

In Europe the prevalence was increased from 760 pmp in 2004 to 889 pmp in 2008 (8).

In our study the mean age was 52 years. Adel Afifi reported that mean age in Egypt increased from 45.6 years in 1996 to 49.8 years in 2008 (5).

Increasing mean age of ESRD patients reflect the improvement of health care however we still away from developed countries as mean age in United State was 61.1 years (4) and median age in United Kingdom (UK) was 65.9 years (9).

In current study the main known cause of ESRD was hypertension (31.1 %) and diabetic nephropathy (15.9 %). The global diabetes burden is predicted to rise to 366 million by 2030 and would present itself as a major health challenge and it has been predicted that the greatest relative increases in diabetes in the next 25 years will occur in the Middle Eastern Crescent, Sub-Saharan Africa and India (10).

In Egypt the prevalence of DN as a cause of ESRD was increased from 8.9 % in 1997 to 13.5 % in 2008 still accounting the 2nd cause as hypertension is the main cause with 36.6% (5).

In some Egyptian governorates like Cairo the main cause of ESRD was hypertension with 29.7% followed by DN with 12.5 %, in Canal governorates hypertension was the main cause of ESRD with 27.3 % followed by DN with 10.7% and in Minia governorate the main cause was also hypertension with 20 % followed by DN 8% (7).

In Sub Saharan Africa the prevalence of DN ranged from 6 % – 16 % (11). The prevalence of DN was estimated to be 14 % - 16 % in South Africa, 23.8 % in Zambia, 9 % in Sudan, and 6.1 % in Ethiopia (2).

In Aleppo city Syria, Ghamez Moukeh reported that the prevalence of DN as a cause of ESRD was found to be 19.5 % counts the 3rd cause after hypertension 21.5 % and GN 20.5 % (12).

In Gulf countries like Qatar DN was the commonest cause of ESRD with 48%, while in Kuwait it was 25% constituting 2nd cause after GN which accounts 32 % (13) and in Iran it was 30.1 % following hypertension with 30.5 % (14) and in Saudi Arabia DN accounts for 25.2 % as 2nd cause following hypertension with 30.4 % (15)

Yao et al in China reported that the incidence of DN increased from 9.9 % in 2000 to 17.2 % in 2005 and counts the 2nd cause of ESRD after GN (16).

In Europe countries, one study from Netherland found that DN 16.7 % is the 2nd cause of ESRD following hypertension 20.4 % (17). In France it was reported that in year 2007, 39 % of ESRD on regular hemodialysis was due to DN (18).

In United Kingdom DN accounts the 2nd cause of ESRD with 14.7 % following GN proven biopsy with 16 % (9).

In United States diabetes accounts the main cause of ESRD with 38.4 % followed with hypertension 25 % (5).

In this study unknown causes constitute 20.5 % of all causes of ESRD. It was estimated to be 27 % in Minia governorate and 18.1 % in Cairo governorate (7) and in all Egypt it was estimated to be 15.2 % (5).

Uncertain etiology of ESRD was estimated to be 14.4 % in Iran (14), 14 % in Qatar (19) and 19.9 % in Saudi Arabia (15). Comparing our results to developed countries like USA (4) in which uncertain causes represent 3.7 % demonstrated a great difference reflecting the poor health care system in developing countries.

In this study the prevalence of hepatitis C was found to be 38.6 %. The prevalence of hepatitis C in dialysis patients showed wide variations worldwide. It was estimated to be 52.1 in Egypt (5), 54.4 % in Syria (12), 21 % in Jordan (20), 18.9 % in Saudi Arabia (21), 43 % in Kosovo (22), 9.83 % in Japan (23) and 5.8% in Brazil (24).

The high prevalence of hepatitis C in Menoufia governorate may be attributed to the high prevalence of hepatitis C in general population, high rate of blood transfusion in dialysis units to treat anemia instead of iron therapy and erythropoietin which is costly and lack of standard methods for infection control in dialysis units.

In this study we found a great percentage of patients discovered their kidney problem when they required dialysis reflecting the lack of awareness of patients for proper time for seeking medical advice and also lack of awareness of primary health care physician about early detection and prevention of CKD especially for those at high risk to develop CKD.

There were a few number of patients were prepared with permanent vascular access when started dialysis reflecting the lack of awareness of treating physician and primary health care physician about the proper time for referral to the nephrologists and may be lack of awareness of some nephrologists about the proper time for preparing patient for renal replacement therapy.

There are no peritoneal dialysis or transplant programs in Menoufia and we found only 2 % of patients under work up of transplantation on personal private bases. In UK the total prevalence of renal replacement therapy is 794 pmp divided as follows 354 pmp for hemodialysis, 64 pmp for peritoneal dialysis and 377 pmp for kidney transplantation (9).

The highest prevalent rates for functioning grafts were reported in Norway 591 pmp and U S 562 pmp while the highest prevalent rate of transplantation per year pmp was reported in Canada 63.1 /year/pmp (4).

### **Conclusions and Recommendations:**

In Menoufia governorate we reported a high prevalence of ESRD patients treated with



hemodialysis. Hypertension and DN were the main known causes of ESRD and unknown causes represent 20.5 %. There is no data registry of dialysis patients. Great proportion of patients discovered their kidney problem late and also not well prepared for renal replacement therapy. Also we have a higher prevalence of hepatitis C. We recommend the following, unified local electronic data registry for each governorate to constitute the National registry.

Increase public awareness about CKD and also increase awareness among primary health care physician about the early detection and prevention of CKD, proper control of hypertension and diabetes mellitus and the proper time for referring patients to nephrologists.

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#### References

1. *Bello AK, Nwankwo E, El Nahas AM.* Prevention of chronic kidney disease: a global challenge. *Kidney Int Suppl.* 2005 Sep;(98):S11-7.
2. *Naicker S.* End-stage renal disease in sub-Saharan Africa. *Ethn Dis.* 2009 spring; 19(1 Suppl 1):S1-13-5.
3. *Jin DC.* Current status of dialysis therapy in Korea. *Korean J Intern Med.* 2011 Jun; 26(2):123-31.
4. *U S Renal Data System, USRDS 2011 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, 2011.*
5. *Zahrán A.* Epidemiology of hemodialysis patients in Menoufia governorate, Egypt. *MNF medical J* 2011; 24:59-70.
6. *Eckardt KU.* Frontiers in the pathogenesis of kidney disease. *J Mol Med.*2009; 87:837-9.
7. *Elminshay O.:* End stage renal disease in the EL-Minia governorate, Upper Egypt: An epidemiological study. *Saudi J Kidney Dis transpl.*2011; 22(5):1048-1054.
8. *Stel VS, van de Luijngaarden MW, Wanner C, Jager KJ;* On behalf of the European Renal Registry Investigators, the 2008 ERA-EDTA Registry Annual Report-a précis. *NDT Plus.* 2011 Feb; 4(1):1-13.
9. *Stenkamp R, Castledine C, Feest T, Fogarty D* UK Renal Registry 13<sup>th</sup> Annual Report (December 2010): Chapter 2: UK RRT prevalence in 2009: national and centre-specific analyses. *Nephron Clin Pract.*2011; 119 Suppl 2:c27-52.
10. *Sarah W, Gojka R, Anders G, Richard S, and Hilary K.* (2005): Global Prevalence of Diabetes. Estimates for the year 2000 and projections for 2030. *Diabetes Care.* 27:1047 1053.
11. *Naicker S.* Burden of end-stage renal disease in sub-Saharan Africa. *Clin Nephrol.*2010 Nov; 74 Suppl 1:S13-6.
12. *Moukeh G, Yacoub R, Fahdi F, Rastam S, Albitar S.* Epidemiology of hemodialysis patients in Aleppo city. *Saudi J Kidney Dis Transpl.*2009 Jan; 20(1):140-6.
13. *El-Reshaid W, El-Reshaid K, Kapoor M, Hakim A.* Chronic renal disease in Kuwaiti nationals: a prospective study during the past 4 years. *Ren Fail.*2005; 27(2):227-33.
14. *Malekmakan L, Haghpanah S, Pakfetrat M, Malekmakan A, Khajehdehi P.* Causes of chronic renal failure among Iranian hemodialysis patients. *Saudi J Kidney Dis Transpl.*2009 May; 20(3):501-4.
15. *Shaheen FA, Al-Khader AA.* Epidemiology and causes of end stage renal disease (ESRD). *Saudi J Kidney Dis Transpl.*2005 July-September; 16(3):277-81.
16. *Yao Q, Zhang W, Qian J.* Dialysis status in China: a report from the Shanghai Dialysis Registry (2000-2005). *Ethn Dis.*2009 spring; 19(1 Suppl 1):S1-23-6.
17. *Termorshuizen F, Korevaar JC, Dekker FW, Jager KJ, van Manen JG, Boeschoten EW, Krediet RT.* Time trends in initiation and dose of dialysis in end-stage renal disease patients in The Netherlands. *Nephrol Dial Transplant.*2003 Mar; 18(3):552-8.
18. *Couchoud C, Lassalle M, Stengel B, Jacquelinet C.* Renal Epidemiology and Information Network: 2007 annual report. *Nephrol Ther.*2009 Jun; 5 Suppl 1:S3-144.
19. *Shigidi MM, Ramachandiran G, Rashed AH, Fituri OM.* Demographic data and hemodialysis population dynamics in Qatar: A five year survey. *Saudi J Kidney Dis Transpl.*2009 May; 20(3):493-500.
20. *Batieha A, Abdallah S, Maghaireh M, Awad Z, Al-Akash N, Batieneh A, Ajlouni KA.* Epidemiology and cost of haemodialysis in Jordan. *East Mediterr Health J.* 2007May-Jun; 13(3):654-63.
21. *Hussein MM, Mooij JM, Hegazy MS, Bamaga MS.* The impact of polymerase chain reaction assays for the detection of hepatitis C virus infection in a hemodialysis unit. *Saudi J Kidney Dis Transpl.*2007 Mar; 18(1):107-13.
22. *Telaku S, Fejza H, Elezi Y, Bicaj T.* Hepatitis B and C in dialysis units in Kosova. *Virologia.*2009 Jun 4; 6:72.
23. *Nakai S, Masakane I, Shigematsu T, Hamano T, Yamagata K.* An overview of regular dialysis treatment in Japan (as of 31 December 2007). *Ther. Apher Dial.*2009 Dec; 13(6):457-504.
24. *Sesso RC, Lopes AA, Thomé FS, Lugon JR, Santos DR.* 2010 report of the Brazilian dialysis census. *J Bras Nefrol.*2011 Dec; 33(4):442-7.