



Prevalence of Hypertension and Diabetes Mellitus among Haemodialysis Patients at Elobied Haemodialysis Unit –West Sudan

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Authors' contributions

This work was a thesis done by author STAM and supervised by author AMHE. Author STAM wrote the protocol and designed the questionnaire and all were revised by the author AMHE. Data and interview were done by author STAM and were checked by the author AMHE. References, data analysis were all done collaboratively between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Background and Objectives: Hypertension and diabetes mellitus are major risk factors of end – stage renal disease (ESRD). This study aimed to determine the prevalence of hypertension and diabetes mellitus among haemodialysis patients at Elobied haemodialysis unit.

Patients and Methods: The study was a single – centre cross - sectional study including 130 patients on chronic haemodialysis in Elobied hospital haemodialysis unit. Each patient was personally interviewed by the co-author in the haemodialysis unit using a structured questionnaire prepared by the investigators. Data collected include: socioeconomic data (gender, age, residence, and occupation), history of hypertension, diabetes mellitus, treatment of hypertension, treatment of diabetes mellitus, duration of hypertension, duration of diabetes mellitus and duration of dialysis. Hypertension was defined as blood pressure $\geq 140/90$ or the use of antihypertensive medications. Diabetes mellitus is defined by use of insulin therapy. In this study both hypertension and diabetes

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mellitus were already diagnosed and on regular medications. Statistic package for social sciences (SPSS) version 20 was used for data analysis.

Results: One hundred and thirty patients were recruited. More than two thirds of patients were males with male to female ratio of 2.2: 1. Patient's age ranged from 12 years to 90 years. The mean age was 46.3 ± 17.8 years. Forty (32%) patients were above 56 years of age. Ninety eight (75%) patients were hypertensive, the majority of hypertensive patients were males (90%). Eighty six hypertensive patients were on calcium channel blocker (88%). Amlodipine was the commonly used antihypertensive used. Twenty five (19%) patients were diabetics and all of them were males. All diabetic patients were also hypertensive. Fourteen diabetic patients (56%) were on insulin therapy, while 11 patients were using metformin.

Conclusion: The prevalence of hypertension among haemodialysis patients was high while the prevalence of diabetes is less than that reported globally. The blood pressure should be tidily controlled specially in diabetic patients and patients with impaired renal function. For early detection of chronic kidney disease and elevated blood pressure as a sequel, routine blood pressure measurement is highly recommended in adult patients attend the clinic for any reason.

Keywords: Hypertension; diabetes mellitus; haemodialysis.

1. INTRODUCTION

End – Stage Renal Disease (ESRD) is a growing problem worldwide and renal replacement therapy is exerting an increasing pressure on health systems. The situation is particularly serious in developing countries where health resources are limited. Approximately 30% - 40% of all patients with diabetes mellitus will develop nephropathy and many will progress to ESRD, necessitating dialysis or kidney transplantation [1]. Hypertension is highly prevalent in dialysis patients. At initiating of dialysis 80% of patients are hypertensive [2].

Haemodialysis unit at Elobied hospital was established in the year 2002 and provides haemodialysis services to a large catchment area including patients from North Kordofan State, Southern Kordofan state, and West Kordofan state.

This study aimed to determine the prevalence of hypertension and diabetes mellitus among haemodialysis patients at Elobeid haemodialysis unit.

2. PATIENTS AND METHODS

The study was a single centre cross sectional study including 130 patients on chronic haemodialysis at Elobeid hospital haemodialysis unit. Each patient was personally interviewed in the haemodialysis unit using a structured questionnaire prepared by the investigators. Data collected include: socioeconomic data (gender, age, residence, and occupation), history of hypertension, diabetes mellitus, and treatment of hypertension, treatment of diabetes mellitus,

duration of hypertension, duration of diabetes mellitus and duration of dialysis. Hypertension was defined as blood pressure $\geq 140/90$ or the use of antihypertensive medications. Diabetes mellitus is defined by use of insulin therapy. In this study both hypertension and diabetes mellitus were already diagnosed and on regular medications. Statistic package for social sciences (SPSS) version 20 was used for data analysis.

3. RESULTS

More than two thirds of patients were males with male to female ratio of 2.2: 1. The mean age was 46.3 ± 17.8 years. Forty two (32%) patients were above 56 years of age Table 1.

Ninety eight (75%) patients were hypertensive, the majority of hypertensive patients were males (90%). Eighty six hypertensive patients were on calcium channel blocker (88%). Amlodipine was the commonly used antihypertensive used (Table 2).

25 (19%) patients were diabetics and all of them were males. All diabetic patients were also hypertensive (Table 3). 14 diabetic patients (56%) were on insulin therapy, while 11 patients were using metformin.

All diabetic patients included in this study were worker, while all workers, housewives and employees included in this study were all hypertensive (Table 4).

More than two thirds of patients were urban (72%) (Table 5). The majority of hypertensive patients and all diabetic patients were urban.

Table 1. Hypertension and diabetes in different age groups

Age groups	Frequency	Hypertension		Diabetes mellitus	
		Yes	No	Yes	No
15 – 25 years	17	17	00	17	00
26 – 35 years	22	22	00	08	14
36 – 45 years	31	31	00	00	31
46 – 55 years	18	18	00	00	18
>56 years	42	10	32	00	42

Table 2. Drugs used in treatment of hypertension

Antihypertensive drugs	Frequency	Percent (%)
ACE inhibitors	10	09%
B-blockers	03	03%
Thiazide diuretics	07	07%
Calcium channel blockers	86	81%

Table 3. Hypertension, diabetes mellitus and gender

Gender	Hypertension		Diabetes mellitus	
	Yes	No	Yes	No
Male	88	00	25	64
Female	10	32	00	41
Total	98	32	25	105

Table 4. Hypertension and diabetes mellitus in different occupations

Occupation	Frequency	Hypertension		Diabetes mellitus	
		Yes	No	Yes	No
Worker	34	34	00	25	09
Housewife	28	28	00	00	28
Employee	15	15	00	00	15
Farmer	28	21	07	00	28
Students	04	00	04	00	04
Unemployed	07	00	07	00	07
other	14	00	14	00	14

Table 5. Hypertension and diabetes mellitus and patients residence

Residence	Frequency	Hypertension		Diabetes mellitus	
		Yes	No	Yes	No
Urban	94	94	00	25	00
Rural	36	04	32	69	36
Total	130	98	32	94	36

4. DISCUSSION

Hypertension is common in patients with advanced stages of chronic kidney disease (CKD) and its prevalence remains very high in patients with end stage renal disease (ESRD) treated with haemodialysis. There is larger frequency of hypertension even in non-dialyzed patients as renal function declines. Systolic hypertension with or without diastolic

hypertension is a major problem in haemodialysis patients, although isolated diabetic hypertension is uncommon [3]. In this study ninety eight (75%) patients were hypertensive. The prevalence of hypertension in this study is a little bit lower than that reported by Gorsane, et al, who reported that the prevalence of hypertension among haemodialysis patients was 90% [4]. Unfortunately most of our haemodialysis patients became too late with end

- stage renal failure, and therefore it is impossible to differentiate between hypertension as a cause of chronic renal disease or a sequel to impaired renal function specially in the absence of previous patient records.

End – stage renal failure requiring dialysis is one of the most serious complications of diabetes mellitus and in developed countries, diabetes is considered as the common cause of chronic renal failure among patients who are starting dialysis [5]. Approximately 30% 40% of all patients with diabetes will develop nephropathy and many will progress to ESRD, necessitating dialysis or kidney transplant [6]. In this study 19% of haemodialysis patients were diabetics so the prevalence of diabetes among haemodialysis patients involved in this study is lower than what is previously mentioned [6]. Metformin has traditionally been regarded as contraindicated in chronic kidney disease (CKD), though guidelines in recent years have been relaxed to permit therapy if the glomerular filtration rate (GFR) is >30 ml/min [7,8]. On the other hand the use of metformin in patients with type 2 diabetes mellitus and advanced chronic kidney disease (CKD) confers a 35% increased risk of all-cause mortality compared to those not treated with metformin [9]. All diabetic patients included in this study had advanced CKD and 11 diabetic patients were on metformin therapy and therefore they were advised to stop it. Hypertension is common among patients with chronic kidney disease and hypertension in the setting of diabetes is defined as a systolic blood pressure \geq 130 mmHg or a diastolic blood pressure \geq 80 mmHg [10]. In this study all diabetic haemodialysis patients were hypertensive. Table 2. Control of hypertension in hypertensive dialysis patients is associated with improved survival. In this study 86 hypertensive patients were on calcium channel blocker (88%) and amlodipine was the commonly used antihypertensive drug. These results were similar to what had been mentioned by Rajiv [11].

5. CONCLUSION

The prevalence of hypertension among haemodialysis patients was high while the prevalence of diabetes is less than that reported globally. The blood pressure should be tidily controlled specially in diabetic patients and patients with impaired renal function.

For early detection of chronic kidney disease and elevated blood pressure as a sequel, routine

blood pressure measurement is highly recommended in adult patients attend the clinic for any reason.

CONSENT

Formal consent was obtained from each patient before enrolled in the study.

ETHICAL APPROVAL

Formal permission was obtained from the director of haemodialysis unit at Elobied Hospital.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Lea JP, Nicholas SB. Diabetes mellitus and hypertension: Key risk factors for kidney disease. *J Natl Med Assoc.* 2002; 94(8):7-15.
2. Ghanbarpour NE, Taheri S, Einollahi B. Prevalence of hypertension among Iranian haemodialysis patients and associated risk factors: A nationwide multicentre study. *PJBS.* 2008;11(6):910-914.
3. Van der Sandie FM, Koorman JP, Leunissen KML. Reverse epidemiology of blood pressure in dialysis patients: Implications for treatment? *Netherland Journal of Medicine.* 2005;63(10):373-375.
4. Gorsane I, Mahfoudhi M, Younsi F, Helal I, Abdallah T. Prevalence and risk factors of hypertension in haemodialysis. *Open Journal of Nephrology.* 2015;5:54-60.
5. lok CE, Oliver MJ, Rothwell DM, Hux GE. The growing volume of diabetes – related dialysis: A population based study. *Nephrol Dial transplant.* 2004;19(12):3098-3103.
6. Lea JP, Nicholas SB. Diabetes mellitus and hypertension: Key risk factors for kidney disease. *J Natl Med Assoc.* 2002; 94(8):7-15.
7. Heaf J. Metformin in chronic kidney disease: Time for a Rethink. *Perit Dial Int.* 2014;34(4):353-357.
8. Inzucchi SE, Lipska KJ, Mayo H, Bailey CJ, Mc Guire DK. Metformin in patients with type 2 diabetes and kidney disease. *JAMA.* 2014;312(24):26668-2675.

9. Lalau J, Kajbaf F, Arnout P, De Broe M. Mortality and metformin use in patients with advanced chronic kidney disease. *The Lancet Diabetes Endocrinol.* 2015;3(8): 605-614.
10. Van Buren PN, Tolo R. Hypertension in diabetic nephropathy: Epidemiology, mechanism, and management. *Adv Chronic Kidney Dis.* 2011;18(1):28-41.
11. Agarwal R. Hypertension and survival in chronic haemodialysis patients – Past lessons future opportunities. *Kidney international.* 2005;67(1):1-13.

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