

HYPERTENSION AMONG RENAL FAILURE PATIENTS

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ABSTRACT

Introduction: Hypertension is a lifestyle related disorder. It is not a disease itself, but can be a leading cause for many other diseases. Many researchers have proved that hypertension is the basic cause of many cardiovascular and renal diseases. Hypertension is generally reported to occur in about 80 per cent of patients with renal disease. In the present study an effort has been made to explore and relate the possibilities of renal failure in patients with hypertension.

Objectives: The objective of the study was to find out relation between hypertension and renal failure among ESRD patients.

Methodology: For the present study 70 patients, undergoing dialysis, were selected on the basis of purposive sampling from a local hospital of Jaipur city, Rajasthan. The data on medical history and renal diseases was collected, using an interview schedule.

Results: The findings revealed that 64% patients suffering from renal failure had a medical history of hypertension. Out of these patients, around 17 patients (27%) also had associated chronic diseases, *viz.* type 2 diabetes mellitus, severe medical illness and medications, that led to renal failure. It was also observed that out of 70 patients, 23% patients developed hypertension after they were diagnosed with renal failure or when they were put on dialysis. **Conclusion:** In all 87% patients were found to be suffering from hypertension. Therefore, it can be concluded from the study that hypertension is the major cause for renal failure.

Key words: Diabetes mellitus, ESRD, Glomerulonephritis, Hypertension, Renal failure

INTRODUCTION

End-stage renal disease (ESRD) and chronic kidney disease (CKD) are emerging public health problems (Modi and Jha, 2006). CKD is a risk factor for ESRD (Iseki, 2008). The continuous growth of population with ESRD is partially related to the under recognition of earlier stages of CKD and the risk factors for its development (Obrador et al., 2002). In India, incidence rate of ESRD has been estimated to be 229 per million population and >100,000 new patients enter in renal replacement programs per year. There are rising incidences of CKD that are likely to pose major problems for both healthcare and the economy in future years (Singh et al., 2013). It is becoming common due to rising incidences of hypertension, diabetes and obesity in ageing population in India. High-normal systolic and high-normal diastolic blood pressure are the two independent risk factors for CKD when compared with optimal blood pressure (Daugirdas, 2011). The approximate prevalence of CKD is 800 per million population and incidence of end stage renal disease is 150-200 per million population (Hase, 2012).

The rationale for conducting this study was to find out incidence of end stage renal disease and its relation with hypertension. There is large database available on diseases like, CVD, diabetes, cancer, gastroesophageal reflux disease etc., in our country; however, there are very few studies on prevalence of renal diseases. The population of India exceeds one billion and is projected to become the major reservoir of chronic diseases like diabetes and hypertension. With 25–40% of these subjects likely to develop CKD, the ESRD burden will rise, and the health-care system would need to take care of these individuals. The treatment of ESRD is very expensive, which indirectly increases economic burden on family as well as on the country. This disease results in poor quality of life in many ways. The present study provides incidence of ESRD in Jaipur, Rajasthan and determines the contribution of hypertension to ESRD.

Objectives

The objectives of the study were:

1. to assess the nutritional status of ESRD patients undergoing hemodialysis, and
2. to find out relation between hypertension and renal failure.

METHODOLOGY

Locale of the study

The study was conducted in Jaipur city, Rajasthan. The data were collected from the dialysis unit of Fortis Escorts hospital, Jaipur.

Sample selection

The sample of the study constituted 70 ESRD or chronic kidney disease - stage V patients, selected using purposive sampling technique. The selection criteria included patients undergoing maintenance hemodialysis (twice or thrice per week from last 1 to 4 years), having GFR $\leq 15\text{ml/min/1.73m}^2$ and were willing to participate in the study. Consent forms were filled by the patients before including them as subjects in the present study.

Data collection

An interview schedule was used to collect information related to the general profile, anthropometric measurements, lifestyle pattern and medical history of the patients. General information included name, age, sex, religion, occupation and marital status of the subjects. Anthropometric data included height, body weight, hip circumference and waist circumference of the subjects, measured using standard tools and techniques. The collected data were further used to calculate BMI and waist hip ratio (Bamji, 2016). Life style data included habits of the subjects related to alcohol consumption, cigarette smoking, dietary habits and activity pattern. In the present study, CDC Atlanta tool (2008) was used for measuring the physical activity of the patients. Medical information was collected from the patients themselves regarding duration of the disease, etiology and frequency of the dialysis in a week. Data collection was carried out after taking permission from the ethical committee of the selected hospital.

RESULTS AND DISCUSSION

The findings of the present study, carried out on 70 patients suffering from CKD stage V (ESRD), have been presented under following sub heads – general profile, anthropometric measurements, lifestyle pattern and medical history.

General Profile

General profile of the selected patients included information related to their age, sex, religion, occupation and marital status.

Table 1: Demographic characteristics of the ESRD patients

Characteristics	Number of patients (n=70)
Age (years)	
25-50	16(22.8)
50-70	48(68.6)
70-80	6 (08.6)
Sex	
Male	52 (74.3)
Female	18 (25.7)
Religion	
Hindu	66 (94.3)
Muslim	3 (4.3)
Christian	1 (1.4)
Occupation	
Government job	26(37.1)
Private job	7(10.0)
Business	11(15.7)
Agriculture	1(1.4)
Self employed	3(4.3)
Home makers	15(21.4)
Unemployed/ Retired	7(10.0)
Marital status	
Married	61(87.1)
Unmarried	5(7.2)
Widow/ Widower	4(5.7)

Figures in parentheses denote percentages.

Age

Age wise distribution of the selected renal failure patients showed that majority of them (68.6 %) were in the age range of 50 to 70 years, indicating higher prevalence in the middle age and older age population. Another 22.8% of the patients were found in the younger age group of 25 to 50 years, which is quite alarming (Table 1). A study conducted in South India on 131 CKD patients too, revealed that around 38% of the subjects were in the age range of 50-69 years and 35 % in the range of 30 to 49 years (Anupama and Uma, 2014).

Sex

Seventy renal failure patients, irrespective of their sex, were selected for the present study. The data revealed higher percentage of male (74%) than female patients (26%) (Table 1). Anupama and Uma (2014), too reported higher percentage of males (58.7%) suffering from CKD than females (41.3%).

Religion

Data on religion of the renal failure patients revealed that majority of them were Hindus (94.3%). Nearly 4% were Muslims and 1.4% were Christians (Table 1). Further, caste-wise data showed that around 84% of patients belonged to general category, 6% to scheduled tribe, 9% to scheduled caste and 1% to other backward caste categories.

Occupation

Occupation data of the renal failure patients revealed that majority of them (37.1%) were in the government jobs. Around 21 % of the patients were home makers, followed by businessmen (15.7%). Ten percent patients were involved in private jobs and another 10% were either unemployed or retired (Table 1). Most of these patients were found to be educated upto post graduate level (31.4%) or upto graduate level (24.3%).

Marital status

Out of 70 patients, 87.1 % were found to be married. Only 7.2 % patients were unmarried and another 5.7% were widows/widowers (Table 1).

Anthropometry

Height (cm), weight (kg), and waist and hip circumferences (cm) of the selected patients were measured using standard tools and techniques. On the basis of these measurements, body mass index (BMI) (kg/m^2) and waist hip ratio (WHR) were calculated (Table 2).

Table 2. Mean values of height, weight, BMI and WHR of selected patients

Anthropometric measurements	Renal patients (n=70)
Height (cm)	166.57±8.81
Weight (kg)	65.49±14.10
BMI (kg/m ²)	23.66±4.55
Waist circumference (cm)	35.73±7.69
Hip circumference (cm)	39.43±6.25
Waist hip ratio	0.9±0.08

Mean ±SD.

Mean height and weight of selected patients was found to be 166.57±8.81 cm and 65.49±14.10 kg, respectively. Using height and weight measurements, body mass index (BMI) (kg/m²) was calculated. The calculated BMI values revealed around 57% of the patients were in the category of normal (18.5 - 24.9 kg/m²), 17% in the category of pre obese (25.00 - 29.99 kg/m²) and 13% in the category of obese (≥30 kg/m²). Almost similar percentage of patients (13%) were found to be underweight (<18.5kg/m²). Mean of BMI was 23.66±4.55 (Table 2). The data revealed that mean values for waist and hip circumferences of the patients were 35.73±7.69 cm and 39.43±6.25 cm, respectively. Mean value for waist hip ratio of the patients (male and female) was 0.9±0.08 (Table 2).

Body Mass Index (BMI)

The height and weight data of renal failure patients was used for calculating their BMI. The calculated BMI values revealed that majority of the patients (57%) were in the category of normal *i.e.*, they had their BMI in between 18.5 and 24.9 kg/m² (WHO, 2006). Of the remaining patients, about 17% belonged to the category of pre obese (25.00 - 29.99 kg/m²) and 13 % to the category of obesity (≥30kg/m²). Almost similar percentage of patients (13%), as that in the category of obesity, was present in the category of underweight (<18.5kg/m²).

Waist Hip Ratio (WHR)

Table 3: Frequency distribution of ESRD patients on the basis of their Waist Hip Ratio

WHR Cut offs	Number of renal failure patients
≥0.95 cm (Men)	10 (19.2) (n=52)
≥0.80 cm (Women)	16 (88.9) (n=18)

Figures in parentheses denote percentages.

Waist hip ratio (WHR) is a health risk indicator given by an individual's ratio of waist and hip circumferences. The data revealed that around 19.2 % of the male patients had their WHR values ≥ 0.95 and 88.9 % of the female patients had their WHR values ≥ 0.85 (Table 3). According to Koning et al. (2007), waist hip ratio (WHR) is considered as a better index of renal risk than BMI. It gives an assessment of abdominal obesity.

Lifestyle

Data collected regarding lifestyle included the smoking habit, alcohol consumption, dietary habits and activity pattern of the renal failure patients.

Table 4: Frequency distribution of the renal failure patients on the basis of their lifestyle pattern

Lifestyle habits	Number of patients
Smoking habit	17 (24.3)
Consumed alcohol	16 (22.8)
Dietary habits	
Vegetarian	38 (54.3)
Non Vegetarian	24 (34.3)
Eggetarian	08 (11.4)
Physical activity*	
Yes	23 (32.9)
Light Activity	17 (73.9)
Moderate Activity	4 (17.4)
Vigorous Activity	2(08.7)

Figures in parentheses denote percentages.

* Light activity –walking and stretching. Moderate activity –brisk walk, yoga, games. Vigorous activity-running.

Smoking habit

Out of 70 ESRD patients, around 24% patients were in the habit of smoking, before they were diagnosed with the disease (Table 4). Smoking is one of the risk factors of hypertension, which in turn can cause renal diseases. In a population based study (Thuy et al., 2010) hypertension was found to be associated with smoking. It was also found that ex-smokers were more likely to be hypertensive than either never-smokers or current smokers.

Alcohol consumption

Consumption of alcohol was reported in nearly 23 % patients before diagnosis (Table 4).

Dietary habits

The dietary habits data of the patients revealed that around 54% of them were vegetarian, 34% non-vegetarian and 12 % were eggetarian (Table 4). Further, out of total patients, only 25.7% patients or their attendants had knowledge regarding renal diet. Data also revealed only 9% patients noted down their daily food intake.

Exercise

Exercise plays an important role in keeping good health. The data revealed that nearly 1/3rd (33%) of the patients were involved in light, moderate or vigorous types of physical activities, for 20 to 25 minutes at least 4 to 5 times in a week (Table 4).

Medical history

The data on medical history of ESRD patients showed that around 47% patients had hypertensive nephropathy, signifying hypertension to be one of the common risk factors for renal failure. Another 17 % patients were found to have both hypertension and diabetes mellitus (Fig. 1). After hypertensive nephropathy, diabetic nephropathy (18.6%) was found to be the second prevalent cause for renal failure. Other factors for renal failure included reasons like, congenital, medication error, surgery and severe medical illnesses (10%). Kidney diseases like, glomerulonephritis, kidney stones and poly cystic kidney disease were found to have caused renal failure in nearly 7 % patients (Fig.1).

During the course of medical therapy, 16 other patients (22.9%) developed hypertension, which might be due to renal failure. On the contrary, two hypertensive patients could achieve normal blood pressure, after they were put on maintenance hemodialysis. In all 61 out of 70 renal patients (87%) were found to be suffering from high blood pressure. Hypertension is both a cause and consequence of renal disease. Epidemiological studies revealed primary hypertension to be a major risk factor for CKD. Daugirdas (2011) reported hypertension to be present in 50 to 75% patients with mild to moderate CKD and in all of the patients who had advanced CKD. He further emphasized that the risk of developing CKD as a consequence of high blood pressure is continuous, beginning at levels which are still considered normal (>120/80 mmHg).

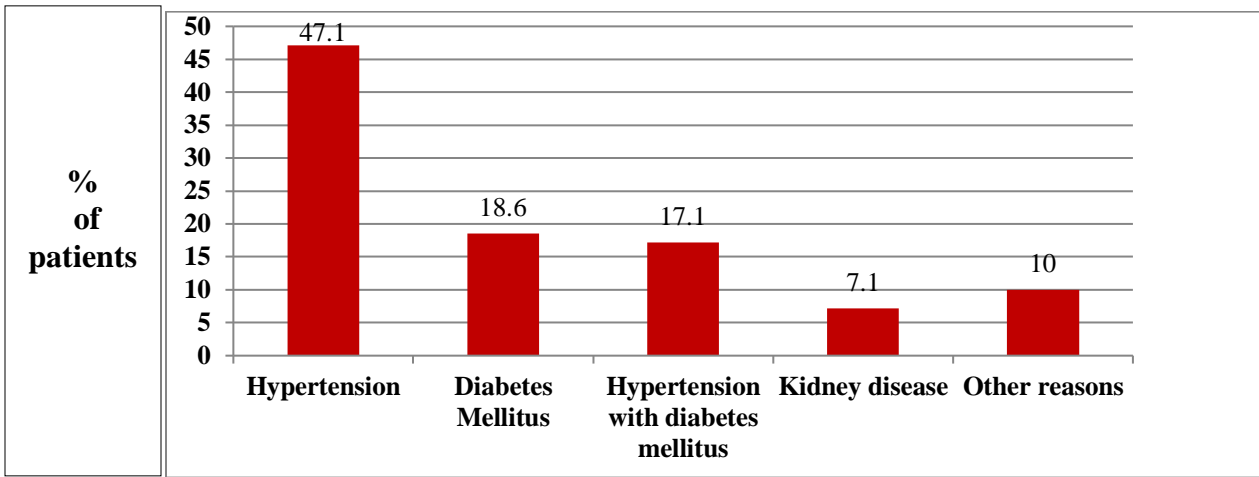


Fig.1: Percentage of renal failure patients diagnosed with other medical problems

The data on duration of the presence of disease was also collected, which revealed 40% patients to have the disease from last 2 years and around 21% to have it from last 4 years. Rest of the patients reported disease duration to be of more than 4 years. All these patients were on dialysis at the time of data collection.

CONCLUSIONS

It was concluded from the study that hypertensive nephropathy was one of the leading causes for renal failure, diabetes mellitus being the second. The results showed association of abdominal obesity, smoking, alcohol consumption and physical inactivity with hypertension.

REFERENCES

- Anupama YJ, Uma G. Prevalence of chronic kidney disease among adults in a rural community in South India: results from the kidney disease screening (KIDS) project. *Indian J Nephrol.* 2014;24(4):214-221.
- Bamji MS, Krishnaswamy K, Brahman GNV. *Textbook of Human Nutrition.* 4thedition. Oxford and IBH Publishing Co. Pvt. Ltd; 2016:152-163.
- CDC (Centers for disease control and prevention) Atlanta. 2008 Physical activity guidelines. https://www.cdc.gov/physicalactivity/downloads/pa_fact_sheet_adults.pdf. Accessed on 5th March 2018.

- Hase NK. Chronic kidney disease- pre-dialysis management: the action plan. *Medicine Update*. 2012;8(5):597-619.
- Iseki K. Chronic kidney disease in Japan. *Intern Med*. 2008;47(8):681-689.
- Daugirdas JT. Handbook of chronic kidney disease management. 1st Edition, Wolters/Kluwer/Lippincott Williams & Wilkins Pvt ltd., Philadelphia, USA, 2011:978-81
- Koning L, Merchant AT, Pogue J. Waist circumference and waist-to-hip ratio as predictors of cardiovascular events: meta-regression analysis of prospective studies. *Eur Heart J*. 2007;28(7):850-856.
- Modi GK, Jha V. The incidence of end-stage renal disease in India: a population-based study. *Kidney Int*. 2006;70(12):2131-2133.
- Obrador, GT, Pereira BJ, Kausz AT. Chronic kidney disease in the United States: an under recognized problem. *Seminars in Nephrology*. 2002;22(6):441-448.
- Singh AK, Youssef MK, Bharati FVM, Kuyilan KS, Sai RK, Reddy VN, Acharya A FA, Channakeshavamurthy A, Ballal HS, Gaccione P, Rajan I, Jasuja S, Kirpalani AL, Kher V, Modi GK, Nainan G, Prakash J, Rana DS., Sreedhara R, Sinha DK, Shah BV, Shamsunder Raj KS, Sridevi S, Tatapudi RR, and Rajapurkar MM. Epidemiology and risk factors of chronic kidney disease in India – results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. *Bio Medical Central Nephrology*. 2013;14:114.
- Thuy AB, Blizzard L, Schmidt MD, Luc PH, Garnger RH, Dwyer T. The association between smoking and hypertension in a population-based sample of Vietnamese men. *J Hypertens*. 2010;28:245–250.
- WHO. BMI Classification, 2006. http://apps.who.int/bmi/index.jsp?introPage=intro_3.html. Accessed on 5th March 2018.
