

## “Study on Relationship of Diabetes and Chronic Kidney Disease with Hypertension: A study in Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh”

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### Abstract:

**Introduction:** Kidney disease is a global health burden in recent times. A large number of people all over the world are suffering from some form of kidney disease. The pattern of kidney disease may differ in different parts of the world. Moreover, a large number of kidney patients suffer from Chronic Kidney Disease.

**Objectives:** The objective of this study is to identify the Relationship of diabetes and chronic kidney disease with hypertension.

**Methods and Materials:** The study was carried out in an institution specialized in research, the Relationship in chronic kidney disease diabetes and with hypertension patients. The name of the institution is Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. A total of 200 subjects data were taken under this study for analyzing their cases who were registered patients at the institute in July to December, 2018. From the patients file, respective data were collected for further analysis.

**Results:** The prevalence of kidney disease was observed in a higher percentage in man (54%) than women (46%). Most of the subjects were of the age range of 51-60 and above 60 years (25.5% each). This specific age range was found almost similarly predominant within both male and female subjects. From the total number of subjects, 70% were suffering from Chronic Kidney disease. In addition, a strong association of diabetes and hypertension with Chronic Kidney Disease was also observed. Among 140 patients of Chronic Kidney Disease, 33% had diabetes, 36% had hypertension and 31% had both diabetes and hypertension. Along with that, from total 200 subjects, 31% had hypertension, 28% had diabetes and 23% had both diabetes and hypertension and remaining 18% had none of them. Besides these, most of the patients (38%) blood group was B+(ve).

**Conclusion:** Although the weight of the kidneys was not available in the patient's medical file, their kidney length was found as normal in size. The evidence from the study presented that, the critical age range for onset of kidney disease is above 50 years for both male and female individual and there is a strong association of diabetes and hypertension with Chronic Kidney Disease.

**Keywords:** Kidney Disease, Chronic Kidney Disease, Diabetes, Hypertension, Critical Age Range.

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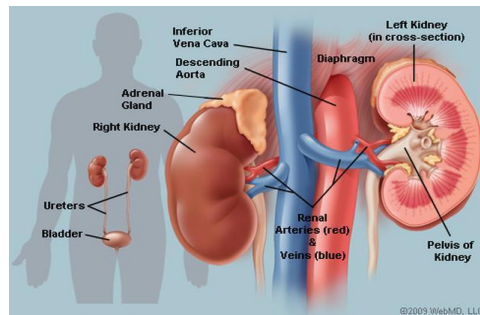
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### I. Introduction

Diabetes is associated with markedly increased cardiovascular risk, a risk compounded with imposition of chronic kidney disease (CKD). Appropriate blood pressure measurement is the Achilles heel of hypertension management, especially in diabetic kidney disease (DKD). One of the most important organs of human body is kidney. The basic functions of kidneys involve removing the waste products from the blood and water fluid level regulation. The kidneys basically filter the blood. Blood in our bodies passes through the kidneys several times a day. Since the kidneys filter blood, they create urine which moves downward to the bladder. (1) Kidneys are bean-shaped organ. The convex side of each organ located laterally and the concave side is at medial. The renal hilus (concave side), provides an area for the renal artery, renal vein, and ureter to enter the kidney. Each kidney is surrounded by a thin layer of fibrous connective tissue forms the renal capsule. The renal capsule facilitates maintaining of the shape of the soft inner tissues. At the deep of the renal capsule is the soft, dense, vascular renal cortex. (2)



Location and structure of the kidneys in human body

Source: Google

The kidneys are situated at the back of the abdomen. The position of the liver is responsible for the position of the right kidney as it is located lower than the left kidney and smaller in size. The left kidney is at vertebral level and the right kidney is located just below the diaphragm. (3). The average size of an adult human kidney is about 10 to 13 cm (4 to 5 inches) long, width is approximately 5 to 7.5 cm (2 to 3 inches) and thickness is about 2 to 2.5 cm (1 inch). The weight of the kidney is approximately 150 to 160 grams of each. Both the kidneys together weight about 0.5 percent of total body weight. The right kidney is slightly smaller than the left kidney. (4). Regular kidney size is directly correlated with age, height and BMI (body mass index). Therefore, the people who are tall and have greater BMI are likely to have larger kidney size than shorter persons who have less BMI. In addition, kidneys usually shrink along with the increasing of age. The above information of kidney size is all about normal healthy adult people. The determination of the kidney size in children is more specific and complex. Kidney disease among people in our country is a common phenomenon. The development of chronic kidney disease (CKD) in developing countries is associated with factors such as poor sanitation hygiene, unavailability of safe water, environmental pollutants and high concentrations of disease-transmitting vectors. The rate of diabetic nephropathy is increasing. Chronic glomerulonephritis and interstitial nephritis are among the major causes of CKD in many countries. Along with that, HIV-associated nephropathy is the major cause of CKD in Sub-Saharan Africa. A large number of people around the world are suffering from various forms of kidney diseases. Kidney diseases are often associated with several other diseases such as, diabetes, hypertension etc. According to the information of National Kidney Foundation, there are several tips for preventing kidney diseases. They are as follows:

- Quit Smoking
- Reduce alcohol
- Lose Weight if You're Overweight or Obese
- Follow a Healthy Diet
- Lower Salt in Your Diet
- Control food habit
- Exercise

A large number of people believe that kidney disease is not curable and the only treatment of kidney disease is kidney dialysis. But the prevention of kidney disease can be done by following several tips. The destination of this study is to identify the prevalence, determine a critical age range for the onset of kidney disease and characterizing the occurrence of kidney disease in Dhaka, Bangladesh by analyzing different cofactors on a retrospective study. Besides these, it is still distinct that, further studies to get a more comprehensive analysis of epidemiological aspect is highly required for establishing better awareness and controlling the disease.

## II. Objectives

### 1. Primary Objective:

- a) The objective of this study is to identify the Relationship of diabetes and chronic kidney disease with Hypertension.

### 2. Secondary objectives:

- a) To collect the information and knowledge about kidney disease.
- b) To verify whether kidney problems depends on age and sex with the objectives
- c) To learn the specialties of kidney patients.
- d) To review the facts based on different variables.
- e) To find out the association of other diseases with kidney disease.
- f) To evaluate of the factors taking into consideration of different categories.

### III. Materials and Methods

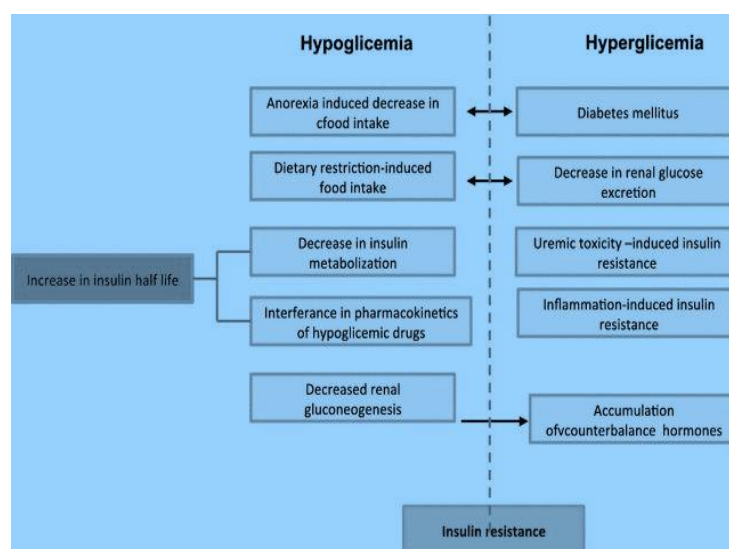
**Place of study:**The study was carried out in an institution specialized in research, diagnosis and treatment of kidney patients. The name of the institution is Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. **Duration of study:**The study was carried out from July to December, 2018 for 6 (Six) months.

**Population of study:**The population of the study was kidney patients who were registered at the hospital. A total of 200 patients data were taken under the study for investigating their cases.

**Methodology:** The study was conducted after taking the patients who were with kidney complications and registered at the institution were the subjects of the study. From the patients file, respective data were collected for further analysis. The statistical methods include, frequency tables, cross table analysis, graphs and charts.

#### Relationship of Kidney disease with diabetes:

Type 2 diabetes mellitus (DM) globally affects 18–20 % of adults over the age of 65 years. Diabetic kidney disease (DKD) is one of the most recurrent and dangerous complications of DM2, affecting about one-third of the patients with DM2. In addition to the pancreas, adipocytes, liver, and intestines, the kidneys also play an important role in glycemic control, precisely due to renal contribution to gluconeogenesis and tubular reabsorption of glucose. (5). Glucose homeostasis is extremely changed in patients with DKD, who are exposed to a high risk of both hyperglycemia and hypoglycemia. Both high and low glycemic levels are accompanied with increased morbidity and shortened survival in this group of patients. Factors that are related to an increased risk of hypoglycemia in DKD patients include decreased renal gluconeogenesis, deranged metabolic pathways (including altered metabolism of medications) and decreased insulin clearance. On the other hand, decrease glucose filtration and excretion, and inflammation-induced insulin resistance are predisposing factors to hyperglycemic episodes. (6)



*Chronic kidney disease mechanisms predisposing to hyperglycaemia and hypoglycaemia*

#### Relationship of Kidney disease with hypertension:

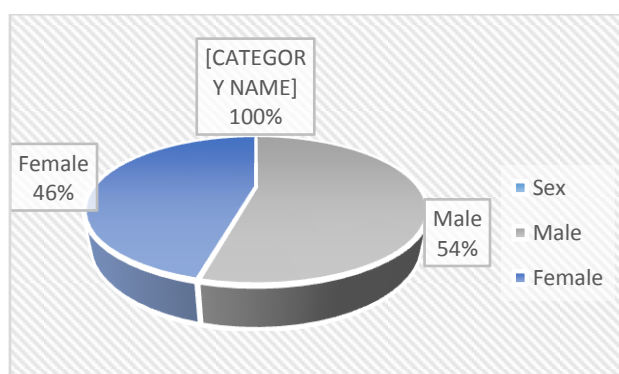
Hypertension is both an important cause and consequence of chronic kidney disease. Evidence from a large number of clinical trials has demonstrated the benefit of blood pressure control. However, it remains unclear whether available results could be extrapolated to patients with chronic kidney diseases because most studies on hypertension have excluded patients with kidney failure. In addition to that, chronic kidney disease encloses a large group of clinical disorders with heterogeneous natural history and pathogenesis. (7). Hypertension is a major risk factor for both cardiovascular and renal disease. Inversely, chronic kidney disease (CKD) is the most common form of secondary hypertension and mounting evidence suggests it is an independent risk factor for cardiovascular morbidity and mortality. The prevalence of CKD has been precisely characterized since the National Kidney Foundation issued a standard classification based on the level of glomerular filtration rate (GFR) and the presence or absence of evidence of renal injury. Patients with stages 1 and 2 CKD need to show evidence of renal injury (e.g., proteinuria), and GFR of  $\geq 90$  and 60–89 mL/minute, respectively. Stages 3, 4, and 5 correspond to GFR of 30–59, 15–29, and  $< 15$  mL/minute, respectively, regardless of any other evidence of renal damage. An estimation showed that, 10–13% of adults in the USA suffer from some degree of CKD. (7)

#### IV. Results

This study was prevalence of kidney disease was observed in a higher percentage in man (54%) than women (46%). Most of the subjects were of the age range of 51-60 and above 60 years (25.5% each). This specific age range was found almost similarly predominant within both male and female subjects. From the total number of subjects, 70% were suffering from Chronic Kidney disease. In addition, a strong association of diabetes and hypertension with Chronic Kidney Disease was also observed. Among 140 patients of Chronic Kidney Disease, 33% had diabetes, 36% had hypertension and 31% had both diabetes and hypertension. Along with that, from total 200 subjects, 31% had hypertension, 28% had diabetes and 23% had both diabetes and hypertension and remaining 18% had none of them. Besides these, most of the patients (38%) blood group was B+ (ve). Data of two hundred (200) patients were studied. Among them, one hundred eight (108) were male and the remaining ninety two (92) were female.

**Table 1:** Frequency Table of distribution of Kidney Patients based on gender (n=200)

Gender	Frequency	Percentage (%)
Male	108	54
Female	92	46
Total	200	100



**Figure 1:** Distribution of kidney patients based on gender

It was observed in the study that, the prevalence of kidney disease is highest in males. From a total of 200 patients, 108 (54%) were males and 92 (46%) were females (Figure 1). All the patients fall in the age range of 11 to 85. Out of the total number of patients, age group of 11 to 20 years had 12 patients, 21 to 30 years had 20 patients, 31 to 40 years had 32 patients, 41 to 50 years had 34 patients, 51 to 60 years had 51 patients and the remaining 51 one patients were more than 60 years old.

**Table 2:** Frequency Table of Distribution of Kidney patients based on age range (n=200)

Age	Frequency	Percentage (%)
11-20	12	6
21-30	20	10
31-40	32	16
41-50	34	17
51-60	51	25.5
Above 60	51	25.5
Total	200	100

It was observed from the study that the highest number of kidney patients fall in the age group of both 51 to 60 years and 61 years and above (25.5%) each. The percentage of kidney patients based on age group are found as follows, 11 to 20 years (6%), 21 to 30 years (10%), 31 to 40 years (16%), 41 to 50 years (17%), both 51 to 60 years and above 60 years had 25.5% patients (Table 2). It was identified earlier that, the most critical age range for the occurrence of Kidney Disease is 51-60 years and above 60 years as well.

**Table 3:** Cross Table Analysis between Gender of the Kidney Patients and their Age Range (n=200)

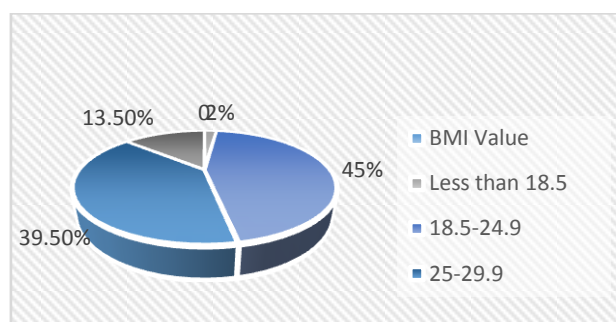
Age	Gender				Total
	Male	Percentage (%)	Female	Percentage (%)	
11-20	9	8.3	3	3.3	12
21-30	10	9.3	10	10.9	20
31-40	18	16.7	14	15.2	32
41-50	19	17.6	15	16.3	34
51-60	24	22.2	27	29.3	51

<b>Above 60</b>	28	26.0	23	25.0	51
<b>Total</b>	108	100	92	100	200

Among the 108 male patients, age group of 11 to 20 years had 8.3% patients, 21 to 30 years had 9.3% patients, 31 to 40 years had 16.7% patients, 41 to 50 years had 17.6% patients, 51 to 60 years had 22.2% patients, and above 60 years had 28 patients. On the other hand, out of 92 female patients, age group of 11 to 20 years had 3.3% patients, 21 to 30 years had 10.9% patients, 31 to 40 years had 15.2% patients, 41 to 50 years had 16.3% patients, 51 to 60 years had 29.3% patients and above 60 years had 25% patients. It can be observed from the data assembly that, in both male and female patients, most of the patients are from age range of 51 to 60 years and 61 years and above. The next critical age range is 41 to 50 years. Body Mass Index (BMI) is a measurement of body fat based on weight and height of a person and that applies to both men and women. BMI is used to indicate if a person is underweight, normal, overweight or obese. (Wikipedia.com, 2017) BMI value of less than 18.5 indicates underweight, 18.5 to 24.9 is normal, 25 to 29.9 is overweight and 30 and above is considered as obese. BMI of a person can be calculated by using the following formula:  $BMI = \frac{\text{Weight (Kilograms)}}{[\text{Height (m)}]^2}$

**Table 4:** Frequency Table of Distribution of Kidney patients based on Body Mass Index (BMI)(n=200)

BMI	Frequency	Percentage (%)
<b>Less than 18.5</b>	4	2
<b>18.5 - 24.9</b>	90	45
<b>25 - 29.9</b>	79	39.5
<b>30 and above</b>	27	13.5
<b>Total</b>	200	100



**Figure 2:** Distribution of Kidney Patients based on Body Mass Index (BMI)

In patients under the study, BMI value was found less than 18.5 for 2% patients, from 18.5 to 24.9 for 45% patients, from 25 to 29.9 for 39.5% patients and 30 and above for 13.5% patients (Figure 2). Most of the kidney patients had an irregular blood pressure and they were suffering from hypertension. Moreover, systolic blood pressure of the patients was randomly measured. The majority of the patients had a high systolic blood pressure.

**Table 5:** Frequency Table of Distribution of Kidney Patients based on their Systolic Blood Pressure (n=200)

Systolic BP (mmHg)	Frequency	Percentage (%)
80-90	9	4.5
91-100	5	2.5
101-120	41	20.5
121-140	77	38.5
Above 140	68	32
<b>Total</b>	200	100

From the data assembly, it can be observed that, 38.5% patients had a high systolic blood pressure. 20.5% of the patients had a systolic blood pressure of 121 to 140 mmHg and it can be considered that, they had a moderately high systolic BP. Diastolic blood pressure of the patients was randomly measured. The majority of the patients had a high diastolic blood pressure. From the data assembly, it can be observed that, 28.5% patients had a high diastolic blood pressure. The maximum percentage (59.5%) of the patients had a diastolic blood pressure of 80 to 90 mmHg and it can be considered that, they had a moderately high diastolic BP.

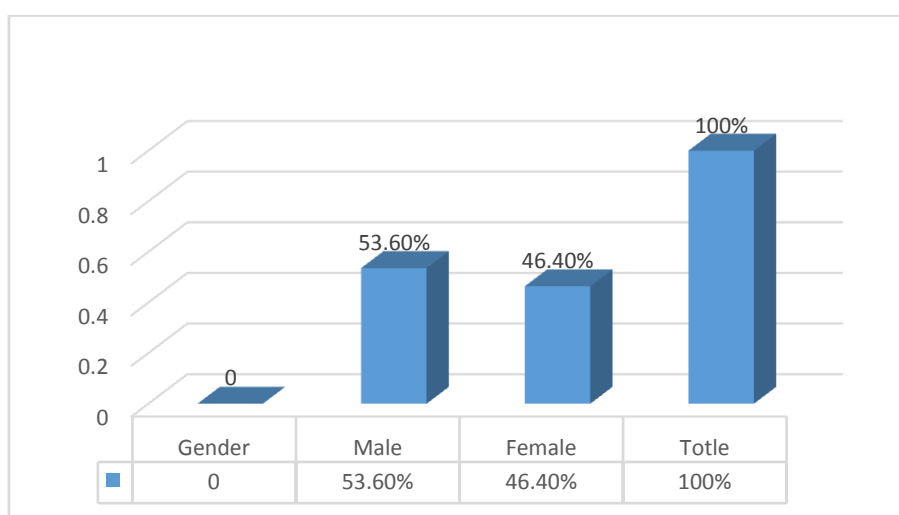
**Table 6:** Frequency Table of Distribution of Kidney Patients based on their Diastolic Blood Pressure (n=200)

Diastolic BP (mmHg)	Frequency	Percentage (%)
50-79	24	12
80-90	119	59.5
Above 90	57	28.5
Total	200	100

Diabetes is disease associated with abnormal blood sugar regulation. Diabetic patients have an injured blood vessel which affects the kidneys for proper functioning. (National Kidney Foundation, 2017) From 56 diabetic patients, 53.6% patients were males and remaining 46.4% patients were females. The data analysis suggests that, prevalence of diabetes is more dominant in male than the female kidney patients.

**Table 7:** Frequency Table of Distribution of Diabetes in Kidney Patients based on Gender (n=200)

Gender	Frequency	Percentage (%)
Male	30	53.6
Female	26	46.4
Total	56	100



**Figure 3:** Distribution of Diabetes in Kidney Patients based on Gender

From the data assembly, it can be observed that, most of the patients (57%) had diabetes for 1 to 10 years, 29% had diabetes for 11 to 20 years and 14% of the patients had diabetes for more than 20 years.

**Table 8:** Frequency Table Analysis of Distribution of Kidney Patients based on their duration of Diabetes (n=200)

Duration	Frequency	Percentage (%)
1-10	32	57
11-20	16	29
Above 20	8	14
Total	56	100

From 30 male diabetic patients, 57% were suffering for 1 to 10 years, 30% were for 11 to 20 years and 13% patients were suffering for more than 20 years. On the other hand, From 26 female diabetic patients, 58% were suffering from diabetes for 1 to 10 years, 27% were for 11 to 20 years and 15% patients were suffering from diabetes for more than 20 years.

**Table 9:** Cross Table Analysis between the duration of Diabetes in Kidney Patients and their Gender (n=200)

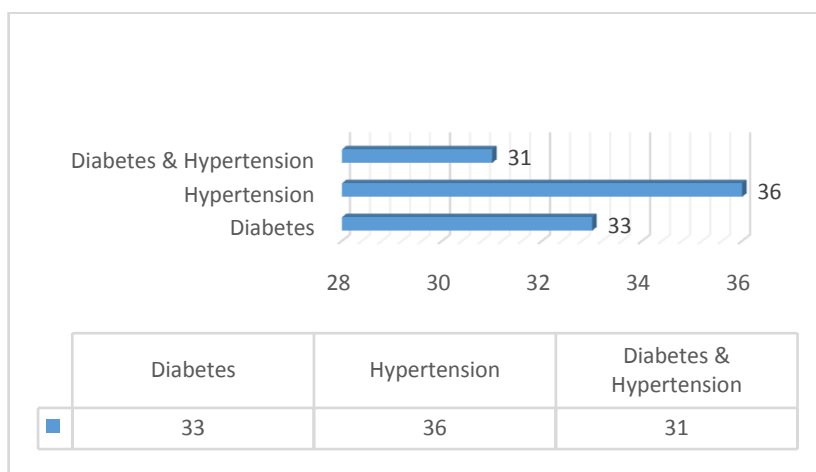
Duration	Gender				Total
	Male	Percentage (%)	Female	Percentage (%)	
1-10	17	57	15	58	32
11-20	9	30	7	27	16
Above 20	4	13	4	15	8
Total	30	100	26	100	56

As stated earlier that, both diabetes and hypertension has a strong correlation with CKD, from the study it can observed that, a large number of CKD patients have both diabetes and hypertension or either one of those two.

**Table 10:** Frequency Table of Distribution of Diabetes and Hypertension in Chronic Kidney Disease (CKD) Patients (n=200)

Disease	Frequency	Percentage (%)
Diabetes	46	33
Hypertension	50	36
Diabetes & Hypertension	44	31
Total	140	100

From 140 CKD patients, 33% were suffering from diabetes, 36% were suffering from hypertension and 31% were suffering from both diabetes and hypertension.



**Figure 4:** Distribution of Chronic Kidney Disease (CKD) Patients based on Diabetes and Hypertension

## V. Discussion

Lack of kidney care and genetic construction can result several health problems. Chronic kidney disease, also called chronic kidney failure refers to when the kidneys gradually stop working. According to the National Kidney Foundation, one in three American adults is at high risk for developing kidney disease. According to the Mayo Clinic, There are many stats that can result kidney disease, including type1 and type2 diabetes, hypertension, obstacles in the urinary tract and inflammation of various parts of the kidneys (8).The basic function of kidneys is the removal of waste product through filtration. If the filtration process gets troubled or damaged, initially they may become porous and substances like proteins can move from blood into urine. At later stages, these filters slowly shut down and lose their ability of filtering. When kidney impairment lasts for more than 3 months, it is called **chronic kidney disease**. This process eventually results in decreased urine production and kidney failure. (8). Moreover, chronic kidney disease is associated with high blood pressure, which not only can be caused by kidney damage but also further facilitates kidney injury and is a major cause for the harmful consequences of chronic kidney disease on other organs that include, increased risk of heart disease and stroke, collection of excess body fluids, anemia, loss of the strength of bones, and impairment of the way the body eliminates medications (8).Another treatment option is a kidney transplant. There is usually a long wait to receive a donor kidney that is compatible with patient’s body, though if the patient has a living donor the process may go more rapidly. The advantages of a transplant are that the new kidney can work perfectly, and dialysis is no longer needed. On the other hand, the disadvantage is that the patient must has to take immunosuppressive drugs after the surgery. These drugs have their own side effects, some of which are dangerous. Moreover, transplant surgery is not always successful (9).A dietitian or health care provider determines a suitable diet for the specific case of kidney disease. Regular blood tests ensure that the diet is appropriate for the patient’s current condition. An individual using dialysis treatment for kidney disease limits certain foods to keep a sustainable level of minerals, fluids and electrolytes to restrict the buildup of fluid and waste products in the body. Such a person excludes foods that contain a lot of water. Various fruits and vegetables are high in potassium, such as oranges, bananas, tomatoes, asparagus and pumpkin. Kidney patients need to avoid potassium because it sometimes causes dangerous heart rhythms. Doctors limit protein before some people begin dialysis but recommend a high-protein diet for other patients. It is better to avoid foods that are high in phosphorus. These include milk, most of the cheeses and yogurt. Doctors sometimes suggest the use

of phosphorous binder medication to restrict phosphorus intake. Kidney patients avoid salty foods because they cause high blood pressure, fluid retention and thirst. Proper care can keep kidneys functioning properly well into old age. One of the most important things to remember is to remain hydrated. Kidneys require water to function properly and to carry away toxins also. According to Dr. Parker, the best way to avoid dehydration is drinking water before getting thirsty, since thirst indicates dehydration. Vitamins can be very important to the function and health of the kidneys. “(Folic acid) helps to reduce levels of homocysteine, which has been linked to heart disease, stroke and kidney disease,” said Dr. Kristine Arthur, an internist at Orange Coast Memorial Medical Center in Fountain Valley, California. Vitamin A is also very important to healthy kidney function (9). Keeping blood pressure in check may also help to long-term good kidney health. A study by the National Kidney Foundation found that, moderately high blood pressure levels in midlife might contribute to late-life kidney disease and kidney failure (10). The American Kidney Fund also suggests that, avoiding a diet high in fat and salt, limiting alcohol, avoiding tobacco and exercising most days are better ways to keep kidneys healthy [10] Approximately 10% of the population across the world is affected by chronic kidney disease (CKD), and millions of people die every year because they do not have access to affordable treatment. According to the 2010 Global Burden of Disease study, chronic kidney disease was ranked 27<sup>th</sup> in the list of causes of total number of deaths worldwide in 1990, but rose to 18<sup>th</sup> in 2010. More than 2 million people worldwide currently get treatment with dialysis or a kidney transplant to stay alive, yet this number may only represent 10% of people who actually need treatment to live. From the 2 million people who receive treatment for kidney failure, the majority are treated in only five countries – the United States, Japan, Germany, Brazil, and Italy. These five countries represent only 12% of the world population. Only 20% are treated in about 100 developing countries that make up over 50% of the world population. More than 80% of all patients who receive treatment for kidney failure are in rich countries with universal access to health care and large elderly populations. It is estimated that, number of kidney failure patients will increase disproportionately in developing countries, such as China and India, where the number of elderly people are increasing. In middle-income countries, treatment with dialysis or kidney transplantation builds a huge financial load for the majority of the people who require it. In another 112 countries, many people cannot pay for the treatment at all, resulting in the death of over 1 million people annually from untreated kidney failure. In the US, treatment of chronic kidney disease is likely to exceed \$48 billion per year. Treatment for kidney failure spends 6.7% of the total Medicare budget to care for less than 1% of the covered population. In England, according to a recent report published by NHS Kidney Care, chronic kidney disease spends more than breast, lung, colon and skin cancer combined. In Australia, treatment for all current and new cases of kidney failure through 2020 will cost approximately \$12 billion. In people aged 65 through 74 across the world, it is estimated that one in five men, and one in four women, have CKD. Chronic kidney disease is a worldwide health crisis in recent times. According to the World Health Organization, in 2005, there were approximately 58 million deaths worldwide, with 35 million attributed to chronic disease. Chronic kidney disease can be treated and it is possible to slow or stop the progression of kidney disease by early diagnosis and proper treatment (11). The annual mortality rate of chronic kidney disease patients in Bangladesh has increased by 52.3% since 1990 and the average is 2.3% per year (12). For male peoples, the lethality of chronic kidney disease in Bangladesh peaks at age 80 and more. It kills men at the lowest rate at age 5-9, which means that this age range is the least vulnerable. At 149.1 deaths per 100,000 men in 2013, the peak mortality rate for men was higher than that of women. Women are killed at the highest rate from chronic kidney disease in Bangladesh at age 80 and more. It was least lethal to women at age 15-19 (12). Hospital, urban and underprivileged population based studies show that there is a CKD prevalence of 16-18% in Bangladesh. From them, 11% are at stage-III and above. Hospital based studies and dialysis units suggest that chronic glomerulonephritis (proteinuria and bilaterally small kidneys) and interstitial nephropathy falls on 37% of causes of (End stage renal disease) ESRD. Moreover, Diabetic nephropathy comprises 33% and hypertension 16% (13). (Renal replacement therapy) RRT in ESRD patients is the minor priority area in Bangladesh due to government policy on health. On the other hand, the priority areas include prevention of communicable diseases, mother and child health and family planning. For these reasons, there are very few government hospitals providing treatment of ESRD. Moreover, most of the RRT is performed by non-government hospitals clinics (13). There are now an estimated 84 dialysis centers in the country and from them, 50% of the dialysis centers are in the Capital. If 200 patients per million populations reach ESRD per year, there would be about 30,000 new patients per year. Currently accessible facilities can hardly accommodate only 9000-10,000 new patients (twice weekly dialysis), which means, 66% of patients have no access to (Hemodialysis) HD. (Rashid, 2014). Cost of single dialysis spans from 3500-5000 taka per dialysis and only 20% are non - profit hospitals. Moreover, 80% dialysis centers are profit oriented [13] Although (Peritoneal dialysis) PD was started in 1986, it is not yet a popular form of therapy in Bangladesh. There are now 10 centers offering PD services, but only two centers perform PD regularly. (Rashid, 2014). A strong association of both hypertension and diabetes with Chronic Kidney Disease (CKD) was also found where both of the diseases lie in concerning percentages (36% and 33% respectively) on the subjects and remaining 31% had both of them. Although the lengths of the kidneys



were also measured, there were no noticeable abnormalities found since all the patients had a normal range. Besides these, most of the patients (38%) blood group was B+(ve) and there were no patients with B-(ve) blood group. Lifestyle can be a major point of concern behind the rise in number of kidney patients in our country. As a higher percentage of overweight (39.5%) and obese (13.5%) patients found from the study, maintaining a regular body weight is necessary to fight against kidney problems. Moreover, extra body weight increases the risk of diabetes and hypertension where both of the diseases are considered as the major risk factors of Chronic Kidney Disease. Drinking impure water is also dangerous for the kidneys as it may contain several harmful chemicals or metals. Therefore, it is much important to drink pure water in an adequate amount to facilitate the proper functioning of the kidneys. Therefore, along with further studies, we need to be more concerned about maintaining a healthy weight by eliminating high calorie foods from our diet as well as doing some physical exercise regularly to correlate lifestyle with onset of Kidney Diseases in our country.

## VI. Limitations of the study

One of the limitations of this study is, it was performed on a small size population. Moreover, the family history of the patients was unavailable. All the required data were not available in each patient's medical record. Therefore, data were collected from a large number of patient's file. Furthermore, although the sizes of the kidneys were available in the ultrasonography report, the weights of the kidneys were unavailable. Along with that, Random Blood Sugar (RBS) of the patients was analyzed, but there were diabetic patients and the blood sugar level of those patients before meal and after meal were not available. Therefore, the RBS analysis of the patients does not represent the actual state of diabetes in kidney patients. Moreover, the data of the systolic and diastolic blood pressure of the patients were randomly measured. Along with that, the data of the systolic and diastolic blood pressure after taking antihypertensive drugs by the kidney patients with hypertension were not available. Therefore, this measurement also does not represent the actual state of blood pressure in the patients. In addition to that, all the patients with irregular blood pressure had hypertension and any kidney patient with hypotension was not found. Therefore, a comparative study of kidney patients with hypertension and hypotension was not possible to construct. Besides these, there was no history of cardiovascular disease available on the patient's medical file and therefore the relationship of kidney disease with cardiovascular disease was not possible to figure out. Other than that, habitual acts of the patients were not available from the medical file. Therefore, a relation of kidney disease with patient's habitual acts was not possible to construct. Further studies on similar area should be conducted on a larger population and broader point of analysis to draw a better precise conclusion on trend, prevalence and cause of kidney disease in Bangladesh in recent times.

## VII. Conclusion

This is evident from the study that, there is a noticeable increasing trend in the prevalence of Kidney Disease particularly Chronic Kidney Disease in present Bangladesh. An alarming prevalence rate of kidney disease is observed in the age group of 51-60 and above 60 years. This data was proved almost similarly predominant in both male and female subjects. The prevalence of hypertension was most (31%) in kidney patients. Moreover, diabetes in kidney patients was also found in a concerning percentage (28%). Besides these, 23% patients had both diabetes and hypertension. Along with that, Cortex and Medulla Differentiation (CMD) status was found poor in 65% of the total patients. This analysis also show the negative impacts of high blood pressure and uncontrolled blood sugar regulation on the kidneys since both of these diseases interrupt the functions of the kidneys.

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