

COMPARATIVE ANALYSIS OF DIABETIC NEPHROPATHY PATIENTS AMONG DIFFERENT ECONOMIC LEVEL (UPPER, MIDDLE AND LOWER CLASS) BASED ON THEIR SOCIOECONOMIC, NUTRITIONAL AND HEALTH CONDITION IN KHULNA CITY, BANGLADESH.

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ABSTRACT

The main purpose of the study was to compare the occurrence of diabetic nephropathy disease among the upper, middle and lower class family at Khulna city in Bangladesh. Data were collected from randomly selected 120 diabetic nephropathy patients in Khulna city through personal interview during August to November, 2014. Mainly socioeconomic condition, nutritional knowledge, anthropometric and dietary pattern were compared among them. In Bangladesh, people belonging to these three classes are suffering from this disease but those from upper class are more affected (near 51.7%). The prevalence of this diseases is higher in male (63%) than female. Amount of drinking water is restricted (Less than 1 liter per day while a health person can drink 4-5-liter water) for Diabetic nephropathy patient, in this survey it has been found that about 52.5% patients drink water by following prescription. Hypertension, constipation and dyspepsia are very common complication associated with diabetic nephropathy and about 73.3%, 55% and 54.2% patients are suffering from hypertension, dyspepsia and constipation respectively. Most of the people were unconscious about their health and they don't have enough knowledge about the disease and nutrition. In this study, it has been shown that 64.2% patients have no previous knowledge about this disease. At the initial stage of the disease, they could not even realize that they are suffering from this disease. At the severe stage, they understand that they have this problem. The survey found that 40.0% patients were in stage 5 (kidney failure) of diabetic nephropathy where 35% and 25% patients are in stage 3 and stage 4 of diabetic nephropathy respectively. Therefore, it can be said that by growing the awareness among people about the health, disease and nutrition we can reduce the risk of diabetic nephropathy. Drugs, discipline and dietary guide lines help to control the prevalence of diabetic nephropathy.

Key Words: Diabetic Nephropathy, Economic Level, Nutritional status.

1.0 INTRODUCTION

At present diabetes is a very common disease all over the world and the rate of diabetes patients is increasing day by day due to changing of life style and food intake patter. Now a days diabetes becomes a burden issues for all the developing countries and Bangladesh is not out of them. According to International Bangladesh (HKIB) "There are currently more than 3.2 million people with diabetes in Bangladesh. This number is expected to rise by

more than 11 million by 2030. This would make the country the seventh largest diabetes population in the world." [Khan A.R., 2013].

Diabetic nephropathy is damage to our kidneys caused by diabetes. In severe cases it can lead to kidney failure. Diabetic nephropathy (nephropatia diabetica), also known as Kimmelstiel–Wilson syndrome or nodular diabetic glomerulosclerosis and intercapillary glomerulonephritis, is a progressive kidney disease caused by angiopathy of capillaries

in the kidney glomeruli. [American Diabetes Association, 2004].

Diabetic nephropathy is the leading cause of kidney disease that affects ~40% of type 1 and type 2 diabetic patients [Gross J. L. et al., 2005]. Nephropathy remains a significant cause of morbidity and mortality in the diabetic population and is the leading cause of end-stage renal failure (ESRD) in the Western World. The abnormal levels of albumin (≥ 30 mg/day or ≥ 20 μ g/min) in the urine is the earliest clinical evidence of nephropathy and this stage is referred to as microalbuminuria. ESRD develops in 50% of type 1 diabetic patients with macroalbuminuria or overt nephropathy (≥ 300 mg/day or ≥ 200 μ g/min) within 10 years and in >75% by 20 years. With type 2 diabetes high proportions of patients are found to have macroalbuminuria or microalbuminuria. Around 20-40% of type 2 diabetes patients with microalbuminuria are gradually proceeds to macroalbuminuria in them only around 20% patients will have progressed to ESRD [American Diabetes Association, 2004].

There are mainly five stages of development of diabetes nephropathy. The rate of kidney filtration is increased during stage 1. The urine albumin levels and blood pressure may be mildly raised or normal with no pathological damage. On the second or hypertrophic hyper filtration stage, there is structural damage of the glomeruli and microalbuminuria starts. The GFR is higher than normal. This stage starts approximately two years after the onset of the disease and is characterized by kidney damage with basement membrane thickening and mesangial proliferation. microalbuminuria stage or initial nephropathy is on the third stage which is also termed as early stage renal disease. The albumin excretion rate is continuously raised around 30-300 mg/d. Blood levels of creatinine are raised and blood pressure may be increased or normal. Stage four is termed as clinical diabetic nephropathy, an irreversible stage of disease. Large amounts of protein pass into the urine (albumin > 300 mg/dU) and blood pressure is almost raised. This stage is also known as chronic kidney failure stage. Last stage is kidney failure or end stage renal disease. This stage requires kidney replacement therapy (peritoneal dialysis, hemodialysis, kidney transplantation) [Vujičić B. et al, 2012].

Edema or swelling of the ankles, feet, lower legs or hands due to water retention, as well as loss of appetite and weight gain due to fluid retention and

edema, headaches, difficulty sleeping, confusion and trouble concentrating, feeling unwell and tired, high blood pressure etc are the symptoms of diabetic kidney diseases [Kerr S.J., 2012]. The risk factors for the development of DN include race, genetic susceptibility, hypertension, increased blood sugar, hyper filtration, smoking, male gender, dyslipidemia, length of time to have diabetes and age. DN has been found to be increased in black skin people [Rohilla A. et al, 2011]. The prevention and the treatment of diabetes nephropathy are depending on the stage and severity of the disease [Kerr S.J., 2012]. A major aspect of initial treatment should consist of lifestyle modifications, such as weight loss, reduction of salt and alcohol intake, and exercise [American Diabetes Association, 2004].

According to the National Kidney Disease Education Program (NKDEP) diet therapy are prescribed to maintain good nutritional status, slow progression of kidney disease, and treat complications such as high blood potassium or phosphorus. Key components of the diet include managing blood sugar through carbohydrate control, managing blood pressure by decreasing sodium intake and reducing protein intake. High-fiber and slow-release carbohydrates are digested more slowly, thus preventing our body from producing too much insulin. So DN patients should choose high fiber carbohydrate. Protein is a very essential nutrient for growth but in DN patient, it was recommended that keeping daily protein intake to 0.8 to 1 grams of protein per Kg of body weight [Otoda T. et al, 2014]. In patients with overt nephropathy and/or renal impairment moderate protein restriction of 0.6–0.8 g/kg/day may be considered. With hypertension and/or proteinuria patient, sodium intake should be restricted to <80 mmol/day or 5g sodium chloride [Clinical Practice Guidelines, 2004]. Phosphorus level in blood should not get to exceed 4.6 milliequivalents per liter because in DN patients it can making bones more brittle and causing itchy skin and bone and joint pain. Excess potassium may build up in the blood in DN patients. If blood level exceeds 5 milliequivalents per liter, will need to limit intake of high potassium foods because high potassium can affect heart rhythm [Otoda T. et al, 2014].

DN is an important public and medical health problem not only in Bangladesh but also in the world and one the major causes of mortality. The genetic cause, food intake pattern, life style, diseases history are linked to the progression of this diseases. In this

study, we try to find out the ration of DN patient among upper, middle and lower family class and to correlate their life style, nutritional pattern related to the development of DN. Large scale epidemiological, genetic and clinical research are needed to explore the different aspect of DN in Bangladesh.

2.0 MATERIAL AND METHOD

2.1 Area selection:

Study area is selected according to the objectives of the study. It is remarkable that the ultimate success of any research work fully depends on the selection of the study area. The study area is Khulna city, is an industrial and developing city. By considering the entire objective, Khulna Diabetic Association and Sheikh Abu Naser Specialized Hospital has been selected for survey. The diabetic association is situated in word number 23 of Khulna City Corporation (KCC) area. All people suffering from diabetes come here for their pathological test, for treatment and as well as for their routine checkup. The Sheikh Abu Naser Specialized Hospital is situated in word number 9 of KCC area. Most of the people who are suffering from Kidney and Heart disease comes here for their pathological test, for treatment and as well as for their routine checkup. The map of the study area is shown in below-



Figure : Map of the study area

Fig 1: Map of survey area in Khulna city

2.2 Surveillance assay

Once the research area has been selected, a reconnaissance visit was conducted for sample units, working schedule and enlisting data sources. This survey has helped us to get a perfect idea about

the study area and effective questioner preparation. In this survey attention was given on the pattern of different types and ages of diabetic nephropathy patients among different classes.

2.3 Study period:

This study was conducted in between the time frame of May 2014 to December, 2014. The survey work was done from August, 2014 to November 2014 in the selected study area.

2.4 Study Population

The adult male and female diabetic nephropathy patients who live in different areas of Khulna city of Bangladesh selected for the study population.

2.5 Sample Size Determination

In this study, Purposive sampling method has been used. Total number of selected sample is 120. These were selected purposively and principle of proportionality

2.6 Sources of Data

The data were collected from the following sources:
a. Primary sources are respondents belonging to the field where the incidence occurs. Data were collected through face-to-face interaction.

b. Secondary source is such a data, which is supplied by some institution. For conducting the study, secondary data were collected from different sources as relevant books and journal, relevant thesis and relevant articles from website.

2.7 Data Collection Methods

The study is mainly based on primary data. Secondary data is also collected to supplement primary data. To fulfill the objective some data is collected from reference materials, official records and other secondary sources.

Interview and examination: The patient interviews were conducted by using well organized questionnaires including the information on demographics, including food intake pattern, nutritional status, physical activity and life style (smoking habits; and use of drugs etc).

Measurements taken included height, weight and blood pressure (BP). Weight was measured while the subjects were light clothing with no shoes. Body mass index (BMI) was calculated as weight (kg)/height (m²). A sphygmomanometer was used to measure BP while the subjects were in a sitting

position and after they had rested for 5 min. The diagnosis of diabetes was based on previous diagnosis by a physician or if their fasting plasma glucose concentration was ≥ 7 mmol/l. The anthropometric data is collected by calculated BMI which helps to measure the nutritional status. The following cut-off points of BMI are used to categorize the nutritional status: Severe malnutrition (BMI < 16), Moderate malnutrition (BMI 16-16.99), Mild malnutrition (BMI 17-18.49), Normal (BMI 18.5-24.99), Overweight (BMI 25-29.99), Obese (BMI > 30).

Food records: 24 hours (1 day) food record was completed at hospital by the patients and they estimated the amounts of food consumed using portion sizes listed in a booklet. The food records were returned during the interview and all records were checked by a clinical or hospital nutritionist and missing information was completed if necessary.

Laboratory measurements: Blood samples were collected and then serum albumin, serum creatinine, serum electrolyte, serum sugar was analyzed.

2.8 Data Processing, Analysis and Presentation

The required data after collection have been processed and analyzed to extract the findings of the

study. Collected data were compiled, code, tabulated for processing and analysis in accordance with the objectives of the study to reach the meaningful conclusion. For processing and analysis purpose, Statistical Package for Social Scientist (SPSS 20).

3.0 RESULTS AND DISCUSSION

Bangladesh is one of the most densely populated country in the world with 1015 persons per sq. km. As Khulna is the third largest city of Bangladesh with population about 17,84,623 as of 2010. [Banglapedia, 2012], Khulna is not so much costly city like the capital Dhaka city. Considering the monthly earning we classified three different economic level of respondent. We selected the upper class with monthly earning more than 25000 BDT, middle class with 11000 to 25000 BDT per month and monthly earning less than 11000 BDT belongs to lower class.

3.1 Socioeconomic Condition of DN patients:

Among 120 DN patients, maximum number respondent are from upper class family (51.7%), 28.3% patients from lower class and only 20% respondents comes from middle class (Table I).

Table I: Distribution of respondents according to economic level

Economic Level	Frequency (=n)	Percentage (%)
Upper(>25,000 tk)	62	51.7
Middle(11,000-25,000 tk)	24	20.0
Lower(<11,000 tk)	34	28.3
Total	120	100

DN diseases is more common in male in both upper and middle class family as 35% and 10.8% respectively. But in lower class the opposite scenario was observed, male (6.7%) and female (21.7%). 31

year to 60 year age group are at risk for DN diseases than less than 31 years and more than 60 years. (Table II).

Table II: Distribution of respondents according to their gender and age in different classes

Economic level	Gender		Age		
	Male n (%)	Female n (%)	18-30 years n (%)	31-60 years n (%)	> 60 years n (%)
Upper Class	42 (35)	20 (16.7)	12 (10)	28 (23.4)	22 (18.3)
Middle Class	13 (10.8)	11 (9.2)	12 (10)	7 (5.8)	5 (4.2)
Lower Class	8 (6.7)	26 (21.7)	8 (6.7)	13 (10.8)	13 (10.8)
Total	63 (52.5)	57 (47.5)	32 (26.7)	48 (40)	40 (33.3)

The data from table II reveal that about 40% patients are 31-60 years old among them about 23.4% patients come from upper class families where only 10.8% and 5.8% patients come from lower and middle class families respectively. This table shows that total 26.7% patients are less than 31 years old and 33.3% patients are above 60 years old.

Table III: Distribution of respondents according to their educational qualification in different classes

Economic level	Education Level							
	Illiterate (%)	Signature (%)	Primary (%)	Secondary (%)	S.S.C (%)	H.S.C (%)	Graduate (%)	Post graduate (%)
Upper	0	0.8	6.7	10	5.8	11.7	11.7	5
Middle	0	0	0.8	4.2	3.4	4.2	6.7	0.8
Lower	2.5	4.2	7.5	5	5.8	1.6	1.6	0
Total	2.5	5	15	19.2	15	17.5	20	5.8

A minor portion (only 2.5%) of patients is illiterate and only present in lower class. In middle and upper class families, there were no illiterate patients. The education level (secondary, S.S.C, H.S.C, graduate and postgraduate level is high in upper class. Most of the lower class patient can only give signature (4.2%) successfully passed the primary level (7.5%). Around 20% patients were graduate, in them 11.7% patients belong to upper class families and only 1.6% patients belong to lower. Post graduate patients belong mainly in upper class (5%) and very few in middle class (0.8%) (Table III).

Table IV: Distribution of respondents according to their occupation and working hour per day in different classes

	Occupation							Working hour per day			
	Unemployed n (%)	Business n (%)	Service n (%)	Day labor n (%)	Housewife n (%)	Student n (%)	Retired n (%)	>8 hours n (%)	7-8 hours n (%)	4-6 hours n (%)	>4 hours n (%)
Upper	13 (10.8)	7(5.8)	12(10)	0(0)	20(16.7)	4 (3.3)	6 (5)	12 (10)	10 (8.3)	14 (11.7)	26 (21.7)
Middle	0 (0)	2(1.7)	9(7.5)	0(0)	11(9.2)	0 (0)	2 (1.7)	11 (9.2)	2 (1.7)	9 (7.5)	2 (1.7)
Lower	2 (1.7)	7(5.8)	2(1.7)	10(8.3)	7(5.8)	2 (1.7)	4 (3.3)	19 (15.8)	2 (1.7)	7 (5.8)	6 (5)
Total	15(12.5)	16(13.3)	23(19.2)	10(8.3)	38(31.7)	6 (5)	12 (10)	42 (35)	14 (11.7)	30 (25)	34 (28.3)

in lower class most of the patients are day labor around 8.3%. As diabetic nephropathy is most common in female, the percentage of housewife (31.7%) is slightly high. The second highest percentage is service person. Around 18.3% patients are service person. Students and retired person from different classes are comparatively safe from DN. The above data also shows how long a respondent works in a day. We know that if a person works above 8 hours per day for a long duration, become more vulnerable for kidney disease where as well as it is also vulnerable to lead a sedentary life. The present survey shows that about 42% respondents work over 8 hours per day and 34% respondents work below 4

hours. In 34% respondents about 21.7% respondents belong to upper class (Table IV).

3.2 Nutritional status and Health condition of DN patients:

Nearby 57.5% patients have normal nutritional status among them 30% patients come from upper class where 11.7% and 15.8% patients belong to middle and lower class families respectively. Obesity is not common in middle and lower class families. Malnourished is more common in lower class families approximately 12.5% as they are not aware about the nutrition and low income Table-V).

Table V: Distribution of respondents according to their nutritional status in different classes

Economic level	Malnourished (BMI: <16-18.49) n (%)	Normal (BMI: 18.5-24.99) n (%)	Overweight (BMI: 25-29.99) n (%)	Obese (BMI: >30) n (%)
Upper Class	12 (10)	36 (30)	9 (7.5)	5 (4.2)
Middle Class	8 (6.7)	14 (11.7)	2 (1.7)	0 (0)
Lower Class	15 (12.5)	19 (15.8)	0 (0)	0 (0)
Total	35 (29.2)	69 (57.5)	11 (9.2)	120 (100)

Table VI: Distribution of respondents according to the presence of hypertension, Asthma, Constipation and Polydipsia in different classes

	Hypertension n (%)		Asthma n (%)		Constipation n (%)		Polydipsia n (%)	
	Present	Absent	Present	Absent	Present	Absent	Present	Absent
Upper Class	47 (39.2)	15 (12.5)	34 (28.3)	28 (23.3)	36 (30)	26 (21.7)	62 (51.7)	0 (0)
Middle Class	17 (14.2)	7 (5.8)	15 (12.5)	9 (7.5)	9 (7.5)	15 (12.5)	24 (20)	0 (0)
Lower Class	24 (20)	10 (8.3)	17 (14.2)	17 (14.2)	20 (16.7)	14 (11.6)	34 (28.3)	0 (0)
Total	88 (73.3)	32 (26.7)	66 (55)	54 (44.2)	65 (54.2)	55 (45.8)	120 (100)	0 (0)

hypertension and asthma is a very common symptom in DN patients. Around 73.3% patients have hypertension where only 26.7% patients have not hypertension. Around 55% patients have asthma where only 45% patients have not asthma. Among 55% patients, 28.3% patients belong to upper class families where 12.5% and 14.2% patients come from middle and lower class families respectively. Constipation is not so much related to DN, it is mainly related to food habit and life style. Around 54.2% patients have constipation where only 45.8%

patients do not have constipation. Among 54.2% patients, 30% patients belong to upper class families where 7.5% and 16.7% patients come from middle and lower class families respectively. As thirsty feeling (Polydipsia) is most visible symptom in diabetic nephropathy patients so here among 120 respondents 100% respondents have thirstiness. Although all the diabetic nephropathy patients have thirsty feeling, they all have limitation of drinking water consumption. They can drink nearby 1-1.5 liters of water per day (Table VI).

Table VII: Distribution of respondents by their family history and presence of pre knowledge in different classes

Economic level	Family History n (%)		Previous knowledge n (%)	
	Present	Absent	Has	Has not
Upper	27 (22.5)	35 (29.2)	28 (23.4)	34 (28.3)
Middle	6 (5)	18 (15)	7 (5.8)	17 (14.2)
Lower	12 (10)	22 (18.3)	8 (6.6)	26 (21.7)
Total	45 (37.5)	75 (62.5)	43 (35.8)	77 (64.2)

The data from table VII relevant that among 120 respondents 37.5% has hereditary diabetic nephropathy, among them 22.5% patients belong to upper class and 62.5 % did not gain diabetic nephropathy from their family. Among all the DN patients, about 64.2% respondents had no pre knowledge about this disease and only 35.8% respondents had this knowledge.

In this study, most of the respondents (58.3%) suffer this disease for less than 1 year where only 0.8% respondents suffer this disease for more than 15 years who comes from middle class.

At initial stage, diabetes nephropathy is an

asymptotic characterized disease which means that most individuals who develop it are unaware of the condition until it has already caused considerable damage. Kidney damage can begin 5 to 10 years before symptoms start [Kerr S.J., 2012]. Stage 1 and stage 2 were not found as these stages, patients do not feel any problem. When patients feel abnormalities at that time they found themselves at stage 3 and 35% patients were found on stage 3. Around 40% (the maximum value) respondents are in stage 5 diabetic nephropathy. Stage 5 is the final stage of DN and the patients need proper dialysis for their survival (Table VIII).

Table VIII: Distribution of respondents according to the suffering time and stage of diseases in different classes

Economic level	Duration of Suffering				Stage of Diseases				
	< 1 year n (%)	1-5 years n (%)	5-10 years n (%)	> 15 years n (%)	Stage 1 n (%)	Stage 2 n (%)	Stage 3 n (%)	Stage 4 n (%)	Stage 5 n (%)
Upper Class	35(29.2)	19 (15.8)	8(6.7)	0 (0)	0 (0)	0 (0)	21 (17.5)	17 (14.2)	24 (20)
Middle Class	13(10.8)	9 (7.5)	1 (0.8)	1 (0.8)	0 (0)	0 (0)	10 (8.3)	7 (5.8)	7 (5.8)
Lower Class	22(18.3)	10 (8.3)	2 (1.7)	0 (0)	0 (0)	0 (0)	11 (9.2)	6 (5)	17 (14.2)
Total	70 (58.3)	38 (31.7)	11 (9.2)	1 (0.8)	0 (0)	0 (0)	42 (35)	30 (25)	48 (40)

Table IX: Distribution of respondents according to prescribed food intake, Calorie intake, water intake and the other type drinks intake pattern in different classes

Economic level	Prescribed food intake pattern n (%)		Calorie intake pattern n (%)		Water intake pattern n (%)			Other type drink intake n (%)			
	Follow	Don't follow	Adequate	Inadequate	< 1 liter	1-2 liters	2-3 liters	No drink	Milk	Alcohol	tea/coffee/soft drinks
Upper Class	56 (46.7)	6 (5)	45 (37.5)	17 (14.2)	32 (26.7)	29 (24.2)	1 (0.8)	40 (33.3)	8 (6.7)	0 (0)	14 (11.6)
Middle Class	21 (17.5)	3 (2.5)	19 (15.8)	5 (4.2)	13 (10.8)	10 (8.3)	1 (0.8)	15 (12.5)	0 (0)	1 (0.8)	8 (6.7)
Lower Class	29 (24.1)	5 (4.2)	21 (17.5)	13 (10.8)	18 (15)	16 (13.3)	0 (0)	23 (19.2)	3 (2.5)	0 (0)	8 (6.7)
Total	106 (88.3)	14 (11.7)	85 (70.8)	35 (29.2)	63 (52.5)	55 (45.8)	2 (1.7)	78 (65)	11 (9.2)	1 (0.8)	30 (25)

Table IX illustrates that most of the patients (88.3%) respondents follow the prescribe food chart and patients from upper class are more aware about the food chart. 70.8% respondents adequately intake calorie where 29.2% respondents do not intake calorie adequately. Among 70.8% respondents, 37.5% respondents belong to upper class family where 15.8% and 17.5% respondents belong to

middle and lower class families respectively. More water intake is restricted for DN patients, so 52.5% patient intake water less than 1 liter where 45.8% and 1.7 % patients drink 1-2 liters and 2-3 liters water per day respectively. Patients not being dialyzed can take < 1 liter to 1.5 liters water according to the health condition of patient. While some time doctor prescribe 1-2 liters water for patient according to

their health condition. The above table indicates that about 65% patients don't drink other type of drinks like milk, alcohol, tea, coffee etc. 9.2 % patients drink milk where 0.8% patient drinks alcohol. Among 120 patients, 25% patients' intake other drinks (tea/ coffee/ soft drinks).

Table X: Distribution of respondents according to the Serum albumin level

Serum albumin level	Frequency (n)	Percentage (%)
< 4.65 g/dl	13	10.8
>4.65g/dl	90	75.0
Don't Know	17	14.2
Total	120	100

Table XI: Distribution of respondents according to the Serum creatinine level

Serum creatinine level	Frequency (n)	Percentage (%)
0.8-1.2 mg/dl	14	11.7
>1.2mg/dl	100	83.3
Don't Know	6	5.0
Total	120	100

Table X and XI show 10.8% respondents have below 4.65g/dl serum albumin level where 75% respondents have above 4.65 g/dl serum albumin level. 11.7% respondents have below 0.8-1.2 mg/dl serum creatinine level where 83.3% respondents have above 1.2 mg/dl serum creatinine level. 14.2% respondents don't know their serum albumin level because some of them belong to lower class family so they have not sufficient money to do the test. 5.0% respondents don't know their serum creatinine level because some of them take dialysis regularly so they do not check this test after dialysis.

4.0 CONCLUSION

Through this research, it has been found that the incident rate of diabetic nephropathy is slightly higher in upper (51.7%) and lower (28.3%) class families. In this research work it has been shown that males are most vulnerable group for diabetic nephropathy. About 88% patients have hypertension and it is influencing their kidney problem. Hypertension is a major risk factor for both macrovascular and microvascular complications including diabetes nephropathy. Diabetic patients with a blood pressure between 130/80 and 140/90 mm Hg have a greater decline in GFR, with 30% of patients developing associated microalbuminuria or proteinuria. Hyperglycemia is another factor which contributes to the progression of renal damage in diabetic nephropathy. It induces an abnormal activation of protein kinase C (PKC),

which is involved in the development of diabetic nephropathy. In this study, it has been shown that most of the people have no pre-knowledge about this disease. In Bangladesh people from each economic society are at risk of diabetic nephropathy because of uncontrolled food habit and life style. The incidence rate of diabetic nephropathy can be minimized by changing life style, food habit and physical activity. Avoid sedentary life style, heavy working, alcohol; smoking may reduce the risk of diabetic nephropathy. It is agreed that diet governs many situations favoring the onset of diabetic nephropathy disease. By changing food habit like minimum amount intake of protein, sodium, phosphorus, potassium may also help to reduce the risk of diabetic nephropathy. Proper knowledge, consciousness, available medical facilities, propagation of information, well-regulated life style, etc may help to reduce the risk of diabetic nephropathy. More study and research may perform on diabetic nephropathy to get more information and knowledge.

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