



STUDY ON ALBUMINURIA IN GERIATRIC PATIENTS (A HOSPITAL BASED STUDY).

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*Corresponding Author**ABSTRACT**

Introduction : The present study was undertaken to study the prevalence of proteinuria (albuminuria) in geriatric patients admitted in department of medicine, Assam medical college and hospital and also to find out the various etiology of proteinuria in the studied patients. **Materials And Methods:** In the present study 160 patients ≥ 60 years of age were taken for the study and evaluated for proteinuria. Patients were evaluated in terms of detailed history, clinical examination, and all required haematological, biochemical, urine, stool, and radiological investigations and recorded. **Results:** In this study, 62.5% patients of geriatric age group had overt proteinuria (100 out of 160). Maximum patients with proteinuria were found in the age group of 60-65 years comprising 44%. Nephrotic range of proteinuria seen in 8% of the patients. Terminal dribbling of urine and hesitancy were the commonest symptoms among the proteinuric patients comprising 65% followed by increase in frequency (60%) and burning micturition (50%). In this study anaemia was the commonest physical finding (72%) followed by poor nutrition (65%) and hypertension (52%). After evaluation urinary tract infection was found to be the most common cause of proteinuria in elderly comprising 39% of total patients studied. Diabetic nephropathy was 2nd common etiology of proteinuria. **Conclusion:** Proteinuria is found to be a very common finding in geriatric hospitalised patients. Prevalence of proteinuria increases with advancing age probably due to increased association of co-morbid conditions. So overt proteinuria in geriatric age group is needed to be evaluated further.

KEYWORDS :**INTRODUCTION**

Longevity of human life has been increasing in the developed countries since long. With increased longevity the attendant ailments have also increased leading to increased need of addressing them. This has resulted in development of new branch of medical science called Geriatric. The term Geriatric stems from the Greek 'Gerias' (old age) and 'iatros' (physician) and thus refers to treating or healing older people.

In 1980, world elderly population was 381.8 million comprising 8.6% of total population. Now it is 650 million comprising 10% of total world population & according to United Nations' projection by 2025 it will be 1021 million comprising 14.8% of total world population. (World population prospect 1988, U.N. New York)

In 1960, elderly population (≥ 60 yrs) was 24.7 million, 5.6% of total populations. In 1980 it was 43.2 million comprising 6.5% of total population. By 2000 it became 75.7 million which was 7.4% of total population. Health problems of the aged are, those due to aging process like, senile dementia, cataract, hearing impairment, speech disability, osteoarthritis etc. certain diseases are more common in among the elderly like, atherosclerosis & its complications (HTN, CVA), COPD, Diabetes Mellitus, IHD, Nutritional deficiencies, Cancers, Benign enlargement of prostate, urinary tract infection, psychological disorders like Depression, Dementia etc.

With the advancing age the number of glomeruli per kidney is reduced to of normal by the age of 60 yrs. Glomerular basement membrane becomes thicker than normal. Tubular cells also undergo fatty degeneration with age and show irregular thickening. Functional changes include decrease in renal plasma flow by 10% per decade. GFR also reduces. Aging reduces the capacity of kidney to concentrate the urine, the maximum capacity diminished by 5% with every 10 yrs of age.

Proteinuria is a common finding in urine analysis in several diseases. Proteinuria is defined as excretion of protein in urine. It is called significant when it exceeds 150 mg per day. Normally <150 mg of protein is excreted in urine. If protein is detected in dipstick urine analysis, it should be investigated further to determine the cause. Although the function of the ageing kidney declines, the presence of protein in urine detected in dipstick urine analysis, should not be taken as normal for the elderly.

In a hospital setup, patients of geriatric age group are present in considerable number, records of AMCH had shown that in last 1 year. The patient of geriatric age group comprise of 13% of all admissions in AMCH and 14.8% of all admission in dept. of medicine. Very few

studies have been carried out in this part of the country on geriatric population in relation to the age related changes in the vital organs which can alter the diagnostic procedure of treatment schedules. In elderly few studies has been carried out in relation to proteinuria and the correlation with different diseases in the Country. No studies have been carried out to find out the prevalence of proteinuria and the causes in elderly hospitalised patients in this part of the country.

Hence this study has been carried out with the following aims & objectives:

1. To study the prevalence of proteinuria (Albuminuria) in geriatric patients hospitalised in department of medicine, AMCH
2. To find out the causes of proteinuria (albuminuria) in the studied patients.

MATERIALS AND METHODS

The present study was undertaken in the department of medicine, Assam Medical College, Dibrugarh.

Selection of cases:

1. All patients ≥ 60 yrs admitted in department of medicine during the period was taken up for study.
2. Dipstick Test for urinary protein done in the selected patients ≥ 60 yrs.
3. Only those patients with gross albuminuria (Dipstick positive) were evaluated further.

Exclusion Criteria:

- 1) Patients below 60 years of age were excluded from the study.
- 2) Patients with Dipstick negative for proteinuria were excluded from the study.

Midstream urine samples were collected in sterile vials from all patients under geriatric age group. Dipstick test for urinary protein was done and positive patients were selected for further evaluation. A detailed history was elicited, a thorough clinical examination undertaken and the data recorded in the performa. To find out the etiology further investigations were done i.e urine analysis (physical chemical, cytological), urine culture, 24 hrs urine protein, Hb, TCDLC ESR, UREA, Creatinine, FBS PPBS, HbA1C, Liver function test, ANA, RA factor, serum electrophoresis, Hb electrophoresis, Chest Xray, USG Abdomen etc.

RESULTS AND OBSERVATIONS:

The present study was carried out in the department of medicine Assam Medical College and Hospital, Dibrugarh. 160 cases were taken up for the study.

Out of total 160 cases 87 fall in the age group of 60- <65 years, 43 cases

in the age group of 65 -<70 years, 20 cases fall in the age group of 70-<75 years, 8 cases fall in the age group of 75-<80 years, 2 fall in the age group of ≥80 years of age. The maximum no is in the 60-<65 years age group comprising 54.37%. (Table :1)

Table 1: Age Distribution Among Geriatric Patients

Age	No of cases	Percentage
60-<65	87	54.37%
65-<70	43	26.87%
70-<75	20	12.50%
75-<80	8	5.00%
≥80	2	1.25%
Total	160	100%

Out of the 160 cases 118 were males (73.75%) and 42 were females (26.25%)

In this study prevalence of proteinuria in geriatric hospitalized patients is 62.5%. 100 out of 160 patients were dipstick positive for proteinuria. (TABLE:2)

Table 2: Prevalence Of Proteinuria In Hospitalized Geriatric Patients

Total cases studied	No Of Cases With Proteinuria	Percentage
160	100	62.5%

Prevalence of proteinuria is seen more in the age group of 60-<65 years and more in males (72%).

Nephrotic range of proteinuria seen in 8 cases out of total 100 cases (8%).

Table :3 Distribution According Range Of Proteinuria

Range of proteinuria	No of cases	Percentage
Nephrotic range	8	8%
Sub nephrotic range	92	92%

Among all the studied patients, the most common presenting symptoms was terminal dribbling of urine with hesitancy during voiding urine, which was present in 65% of the patients. Increased frequency of micturition was present in 60% of the patients and burning micturition in 50%. Fever was present in 40% patients whereas other symptoms like swelling of legs (25%), puffy face (20%), respiratory difficulty (10%), oliguria (20%), haematuria (2%) and pain abdomen were also seen among the patients. (Table 4)

Table 4: Distribution Of Patients According To Presenting Symptoms:

Presenting symptoms	No of cases	Percentage
Increased frequency of micturition	60	60%
Burning micturition	50	50%
Nocturia	30	30%
Hesitancy	65	65%
Terminal dribbling of urine	65	65%
Oliguria	20	20%
Haematuria	2	2%
Swelling of legs	25	25%
Fever	40	40%
Puffiness of face	20	20%
Respiratory distress	10	10%
Pain abdomen	30	30%

Anaemia was the commonest sign found in 72% of the patients. Poor nutrition in 65% and hypertension in 52% patients were common findings. Dependant edema was found in 26% patients. Ascites was present in 22% patients. Postural hypotension in 20%, periorbital edema 19%, pleural effusion 5%, Lymphadenopathy 4% was other clinical findings in the studied patients. (Table 5)

Table 5: Physical Findings In Cases With Proteinuria

Presenting findings	No of cases	Percentage
Oedema	26	26%
Pallor	72	72%
Periorbital oedema	19	19%
Poor nutrition	65	65%
Hypertension	52	52%
Postural hypotension	20	20%
Lymphadenopathy	4	4%
Ascites	22	22%
Pleural effusion	5	5%

Among the cases with macroalbuminuria positive in dipstick test, most common etiology of proteinuria is urinary tract infection (39%). Second most common etiology is diabetic nephropathy comprising 31% of total patients evaluated. 1 patient was found to have renal cell carcinoma. CKD accounted for 11% of the patients. (Table 6)

Urinary tract infection was seen more in females and diabetic nephropathy was noted more in males.

Table 6: Etiology Of Proteinuria In Studied Patients

Disease	No. of cases	Male	Female	Percentage
Urinary tract infection	39	19	20	39%
Diabetic nephropathy	31	23	8	31%
Malaria	12	12	0	12%
Renal cell carcinoma	1	1	0	1%
NonHodgkin's Lymphoma	4	4	0	4%
Chronic renal failure	11	11	0	11%
Carcinoma of lung	1	1	0	1%
Carcinoma of sigmoid colon	1	1	0	1%

52% of the patients with overt proteinuria were found to have hypertension.

DISCUSSION

Proteinuria is a common finding in the hospitalised patients. The incidence varies with the age and sex¹. There is some variation in the cause of proteinuria in different age groups.

The present study was carried out in the department of medicine, Assam Medical College & Hospital, on 160 patients over the age group of 60 years. Out of total 160 geriatric patients 87 fall in the age group 60-<65 years, 43 falls under the age group 65- < 70 years, 20 falls under the age group 70-<75 years, 8 falls under the age group 75 < 80 years, and 2 falls in the age group >80 years. The maximum number is in the age group 60-<65 years, that comprises 54.37% of the total.

Out of total 160 geriatric patients 118 were males comprising 73.75% and 42 were females that comprised 26.25% of the total studied patients.

Out of these total 160 patients, 100 patients were found to have proteinuria comprising 62.5%.

On reviewing some related studies, Isthiaque Ahmed, et al. Departments of Nephrology & Community Health Medicine, CMC Vellore, India, found the prevalence of proteinuria in the adult rural population was 0.47 per cent (0.30-0.67%)³.

In another community based study by Lindeman RD et al. on Prevalence of proteinuria in an elderly urban, biethnic community, found 10.5% had 1+ or greater proteinuria (30 mg/dl or more) by conventional urinalysis dipstick method⁸.

The above studies were community-based studies enrolling large ample size 5043 In the 1 and 696 in the 2nd. The variation in the observations with the present study is because of the sample size and study location (hospital based and community based).

Proteinuria is found to be more prevalent in the age group of 60-<65 years, that comprises 44% of the total proteinuric patients. In this age group 87 patients were evaluated and 44 were found to have proteinuria (50.57%). In the age group or 65-70 years, 28% patient of total 100 patients had proteinuria. In this age group out of 43 patients 28 had overt proteinuria (65.11 %). 18 patients with proteinuria fall under the age group 70-<75 years. Out of 20 patient evaluated in this age group 90% had overt proteinuria. In the age group of 75-< 80 years all 8 patients evaluated for proteinuria had a positive dipstick test (100%). Same result is seen in the age group of >80 years, in which 2 patients were evaluated for proteinuria, had a positive test (100%).

Although the number of cases is less above the age of 75 years, we found all the patients had overt proteinuria. The number of cases was highest in the age group of 60-<65 years, but the prevalence in this age group is 50.57%. Whereas in >75 years group the prevalence is 100%. So the prevalence of proteinuria increases with advancing age.

In the study by Isthiaque Ahmed, et al. had found a prevalence of 0.32% males and 0.35% in females in the age group 60-79 years³.

Moreover, in the age group of >80 years they found the prevalence 0.07% in males and 0.03% in females.

This difference is seen due to variation in sample size and location of the study.

In the sex distribution of the proteinuric patients, we found that 72 out of total 100 patients were male and 28 were female. In the study total 118 male patients were evaluated, and 72 were positive in dipstick test (61.01%). Out of 42 female patients evaluated for proteinuria 28 became positive (66.66 %).

In this study, we found that the number of cases with proteinuria is less in females but the percentage is slightly higher than the males.

In the study by Istiaque Ahmed et al⁵, the prevalence of proteinuria in male was 0.75% and in female was 0.31%.

In the present study, we found that 92% of the patients with proteinuria had excreted protein in the Subnephrotic range, and only 8% had Nephrotic range of proteinuria. Out of these patients all 8 patient with nephrotic range of proteinuria were male and in the age group of 70-<75 years.

Among the patients with albuminuria positive in dipstick test, after evaluation we found most of the patients were having urinary tract infection (39%). Out of these, 19 were males and 20 were females. It is seen that 71.4% of the female proteinuric patients had UTI, only 26.38% of male proteinurics had UTI.

Sultana et al. subjected urine from 400 consecutive patients presenting with typical features of UTI to protein-reagent-strip testing (Ames Multiple Reagent Strip, Bayer Diagnostics); 87 of these patients subsequently had culture-confirmed (210 CFU/ml), predominantly E.Coli UTI¹². Sandberg et al reported significant albuminuria (measured by immunoassay) in 8 of 15 non pregnant women with cystitis¹¹. A study by Zhang et al. on predominantly Caucasian female adults with reflux nephropathy (n=294) observed proteinuria, detected by reagent strip, at presentation in only 4.8%, most (80.3%) patients had presented with a complicating UTI¹³.

Next common diagnosis of the studied patients was diabetic nephropathy, which comprised of 31% of the total patient evaluated. Out of which 23 were males and were female patients.

In a study carried out by Kalathil K et al. in Allegheny General Hospital West Penn Allegheny Health System, Pittsburgh, Pennsylvania, found that diabetic nephropathy comprised 17% of the patients >60 years, studied to determine if differences exist in diagnostic approach, aetiology, therapy, and outcome between older (>60 years) and younger (<60 years) patients referred for evaluation of proteinuria⁶. They had enrolled 69 patients out of which 24 were 60 years. Therefore, the study population was small giving a difference in observations with the present study.

In the study done by Istiaque Ahmed et al. observed that 54% of the patients with significant proteinuria had diabetic nephropathy⁵. Their study was community based in large sample size giving the variations. KU Lee et al. in University of Ulsan, Seoul, Korea, had studied the prevalence and the associated features of microalbuminuria and Overt proteinuria in Korean subjects with non-insulin-dependent diabetes mellitus (NIDDM) attending a hospital clinic. They found that increased albumin excretion rate was present in 34% of the patients: 20% had microalbuminuria and 14% had overt proteinuria. Of patients with diabetes duration $\geq$ 15 years, 35% had overt proteinuria⁷.

In the present study, in 12% of the patients with proteinuria were found to have complicated malaria as the aetiology. Due to high endemicity of malaria in this part of the country, the prevalence of malaria as a cause of proteinuria is high.

In a study done by Dr.Abu El Gasim Osman Kroum and Dr. Babiker Ahmed Mohammed in department of pathology and microbiology, University of Kassala, Sudan, had observed that 84.6% of malaria patients (slide positive) had dipstick positivity for proteinuria⁴.

One patient was found to have renal cell carcinoma who also had Haematuria at the same time. Four patients had Nonhodgkins

lymphoma (lymph node biopsy diagnosed) who had overt proteinuria. One patient had carcinoma of lung, and one had carcinoma of sigmoid colon.

Study by Daniel Rudman, et al. on Proteinuria with Disseminated Neoplastic Disease; have found that proteinuria is associated with disseminated cancers of colon, ovary, lung breast, and pancreas and with Hodgkin's disease and acute myeloid leukaemia².

We observed that hypertension is present in most of the patients. 52% of the total patients evaluated for proteinuria had hypertension. Hypertension was associated with diabetes or with some other diseases in these patients.

In a study done by Robert M. Guthrie et al. on Screening for proteinuria patients with hypertension or diabetes mellitus, they found that out of the 120 patients with hypertension who were evaluated, proteinuria was detected 19 (16%). Proteinuria was detected in 10 of the 35 (29%) patients with diabetes mellitus and in 8 of the 15 (53%) patients with both hypertension and diabetes mellitus¹⁰.

Although proteinuria is common in hypertensive patients, it is difficult to differentiate the cause of proteinuria if other diseases coexist. Without kidney biopsy, we cannot comment on the correlation of hypertension with proteinuria in these patients.

CONCLUSION

Proteinuria is very common in geriatric patients in this part of the country in a hospital set up, where patients come with various diseases. Studies on proteinuria in geriatric age group are very less and the difference in the observations are due to the difference in sample size, place of study (hospital based or community based), and endemicity of some diseases in the studied part of the world.

The prevalence of proteinuria increases with age probably due to increase association of some Co-morbid conditions i.e. UTI, Diabetic nephropathy, hypertension etc. So proteinuria should not be accepted as an inevitable consequence of ageing; rather, this may be the result of some underlying disease conditions.

So proper clinical evaluation and investigations should be done in every elderly patient with proteinuria with or without apparent renal disease.

It will be too early to conclude from this study, which included only 160 geriatric patients. Further, well coordinated studies, with large sample size and newer and proper investigative facilities (i.e. kidney biopsy), on proteinuria in geriatric patients is needed to know the actual scenario in this part of the country.

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