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Prevalence and Risk Factors of Renal Impairment among Rheumatoid Arthritis Patients Attending Outpatient Department of Tikur Anbessa Specialized Hospital

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Abstract

Background: The global burden of chronic degenerative disease is increasing worldwide. Most developing countries have dual burden with infectious and non-infectious diseases. Kidney disease is a long term health condition and defined as the gradual loss of body, renal function and death over time. Renal abnormalities were quite prevalent in rheumatoid arthritis patients and there is a significant increase of renal derangement with duration of disease and severity of disease activity.

Methods: A hospital based cross-sectional study was conducted. Blood sample was collected for assessment of urea and creatinine. Urine sample was also collected for protein and blood detection. Serum creatinine was analyzed by an automated biochemistry machine Mindray 200 BS. Urine protein and blood was detected by chemical test. Descriptive, bivariate and multivariate analyses were used to analyze the data. Odds ratio with 95%CI was estimated to assess the predictors of renal impairment.

Result: Out of 219 rheumatoid arthritis patients, 49 (22.4%) had renal impairment. Serum creatinine level in mg/dl of the patients were with mean and standard deviation (SD) of (1.67 ± 0.47 SD) with adjusted odd ratio (AOR) and (95%CI):14.07 (5.09, 38.91), Mean (± SD) age of the participants was 43.82 (± 14.03) years and about 75.3% were females. Protienuria 44 (20.1%) with AOR (95%CI):1.93 (1.68, 5.58) and Body Mass Index (BMI) above 25 with AOR (95%CI): 0.1 (0.02, 0.45) shows significant association with the prevalence of renal impairment.

Conclusion: The study revealed that the prevalence of renal impairment in patients' with rheumatoid arthritis is high. Screening for renal impairment for patients with rheumatoid arthritis will be very helpful to peak kidney disease at earlier stage.

Keywords: Cross sectional study; Rheumatoid arthritis; Prevalence; Renal impairment; Predictors; Bivariate and multivariate analyses

Introduction

The global burden of chronic degenerative disease is increasing worldwide. Among those, kidney disease is an increasing global health problem [1]. Due to the fact that it is a silent condition and its prevalence is considered to be underestimating [2]. According to World Health Organization's report, 2003, the prevalence of impaired kidney function was estimated to range between 10% to 20% of the adult population in most countries worldwide [3,4].

However, a recent study suggests that the incidence of kidney disease is increasing globally [5]. Chronic kidney disease is reported to be 3-4 times more common in Africa than in developed countries [6]. The incidence of chronic kidney disease in Ethiopia is rising because of increased risk factors such as rheumatoid arthritis, high blood pressure and diabetes mellitus [7,8].

It has been estimated that more than 500 million individuals globally have chronic kidney disease, defined by either kidney damage or glomerular filtration rate <60 ml/min/1.73 m^2 [9]. The main epidemiologic significance of disease is due to asymptomatic chronic kidney disease patients in the early stages of the disease process. Renal abnormalities were quite prevalent in rheumatoid arthritis patients and there was significant increase of renal derangement with duration of disease and severity of disease activity [10]. The reported kidney disease prevalence in patients with rheumatoid arthritis ranges from 5% to 50% based on studies of different designs and the true prevalence of kidney disease remains unclear [11].

The prevalence of kidney disease is more in blacks than whites' counterparts [12,13]. The higher prevalence among Africans has been attributed to genetic predisposition, low socio-economic status and inequities in access to healthcare [14]. As reports of many researches reveal, rheumatoid arthritis related kidney disease is one of the leading causes of chronic morbidity in the developed world, but little is known about the disease burden in Africa [15,16].

Renal disease is a common cause of mortality in patients with rheumatoid arthritis. This may be as a result of the disease itself, drugs used in treatment and other rheumatoid nephropathy [7]. Since rheumatoid arthritis patients have not experienced the same

improvement in survival as the general population, the mortality gap between rheumatoid arthritis patients and individuals without rheumatoid arthritis has widened [17].

Rheumatoid arthritis is a heterogeneous and progressive autoimmune disease which affects all ethnic groups throughout the world [18]. The World Health Organization considers it as one of the diseases with the greatest impact on society [19]. And it is the 42nd highest contributor to global disability [20].

Rheumatoid arthritis is often seen as a minor health problem and has been neglected in research and resource allocation throughout Africa despite its potentially fatal systemic manifestations [21]. This is also true in Ethiopia, which implies that awareness creation on the disease burden and disease process is necessary.

The prevention and management of rheumatoid arthritis could help to reduce other related disease by reducing shared risk factors and prevalence of systemic manifestations like chronic kidney disease which is serious health problems but treatable disease if caught in the early stages [22].

If patients take the treatment without knowing that they have kidney disease, it causes series health conditions; such that early diagnosis is become vital. Some of the drugs used for treatment of rheumatoid arthritis have severe toxic effects on the kidney even in patients with only mild renal insufficiency and therefore they require some dosage adjustment [7]. Therefore, assessment of kidney function using different laboratory diagnosis system in patients with rheumatoid arthritis is necessary for appropriate choosing and dosing of drugs.

In general, the topic inevitably has value for clinical diagnosis and monitoring of rheumatoid arthritis patients with early or mild kidney progress to prevent further damage. Therefore, this study uses as baseline survey on the magnitude of renal dysfunction in rheumatoid arthritis patients, associated factors and informs on modes of intervention. Knowing the risk factor and creating awareness may also provide a means of optimizing care.

Therefore, this research would help in identifying key gaps and provide a good means of understanding the disease and the associated risk factors in the treatment courses.

Materials and Method

Study area and period

This study was conducted at Tikur Anbassa Teaching and Specialized Hospital which is located at Lideta sub city, Addis Ababa, Ethiopia. It is one of the largest general public hospitals under the Federal Ministry of Health located in Addis Ababa and also it is the training center for undergraduate and postgraduate medical students, dentists, nurses, pharmacists, laboratory technicians and others who shoulder the health problems of the community and the country at large. It also gives patient diagnostic service for many people in the community.

The hospital is selected as study site for it is the only specialized referral hospital in Addis Ababa involved in the diagnosis and treatment of RA patients. This cross sectional study was conducted for a period of 6 months from July 2015 to January 2016 study design and study period.

Study design and source population

Cross sectional study was conducted. All Patients with rheumatology case seen at the rheumatology clinic during the study period were used. Confirmed rheumatoid arthritis cases that have seen at Tikur Anbessa Specialised Hospital during the study period and having a baseline data.

Sample size and sampling procedures

The sample size is calculated based on single sample size estimation. The value of p is taken considering 95% confidence interval, 5% margin of error and; the value of p taken was 18% from the previous study conducted on prevalence of kidney disease on rheumatoid arthritis patients [23]. The sample size is calculated using the following standard formula.

The sample size $n=z(\alpha 2)^2 p\ (1-p)/d^2$

Where n=sample size

$z(\alpha 2)^2$=At 95% confidence interval Z value (α=0.05)=1.96

p=Proportion of occurrence of the event to be studied

d=Margin of error at (5%)(0.05)

$n= (1.96)^2 \cdot 0.18\ (1-0.18)/(0.05)^2$

n=227

As computed above, the sample size for this study is 227. However, we were only able to obtain 219 samples in a given time frame. Consecutive sampling technique was employed to include study participants who meet the inclusion criteria during the study period.

Measurement and study variables

Independent variable: Independent variables include age, sex, weight, smoking, obesity, urine blood and medication use in the treatment course.

Dependent variables: Creatinine, urea, and estimated GFR (Glomerular Filtration Rate)

Data collection and quality control: Data collectors or nurses was identified, trained and informed to collect the data as per the pre-structured questionnaire. The purpose of the study as well as any related harm and benefit was explained to the study participants accordingly. Demographic data and potential risk factor of rheumatoid arthritis like cigarette smoking, habit coincident remote site infections and other risk factors were recorded.

Blood sample: During the study, blood sample was collected by using sterile needle, taken carefully, from those patients that come to rheumatology clinic and screened for rheumatoid arthritis by physician. Cooler boxes with ice packs were used for temporary storage until the sample reach to laboratory. Samples were delivered to the laboratories at the end of the day's collection. Analysis was done immediately after delivery.

Urine sample: A minimum of 10 ml of urine sample was collected by using sterile, capped urine collection. The urine sample was analyzed for protienuria and hematuria at the clinic by dipstick. Results obtained were recorded immediately during the study performed.

Transportation of specimens: Following collection from patients, specimens was transported carefully to clinical chemistry laboratory within 30 min.

Sample processing

Serum urea, creatinine was determined and finally estimated glomerular filtration was calculated using cockcroft gault formula and urine protein and blood was determined using urine strip method. Serum creatinine was analyzed in the renal unit laboratory using the Mindray 01 which is an automatic biochemistry analyzer and also urine analysis was performed by the principal investigator at the site of collection using the urine chemical test. It was assessed of with the parameters on a colored visual scale.

Creatinine determination

Method: Modified jaffé method

Reaction principle:

Creatinine+picric acid → Creatinine picric acid complex

At an alkaline solution, creatinine combines with picric acid to form an orange red colored complex. The absorbency increase is directly proportional to the concentration of creatinine.

Serum urea determination

Method: Berthelote enzymatic colorimetric method

Reaction principle:

$$Urea \xrightarrow{Urease} \left[NH_4^+\right]_2 + CO_2$$

NH_4^++salycilate+NaClO → Nitroprusside indophenol

The intensity of the color formed is proportional to the urea concentration in the sample.

Estimation of GFR: Monitor GFR

Using cockcroft gault formula: Cockcroft gault formula: GFR (ml/min)=k × (140-age) × body weight/SCr (in µmol/l). Where, k=1.04 (female) or 1.23 (male).

Kidney disease prevalence was estimated from apparent kidney damage and kidney function and categorized according to the NKF classification as follows [24].

Stage 1: GFR ≥ 90 ml/min: normal Renal Impairment.

Stage 2: GFR 60 ml/min to 89 ml/min: mild renal impairment.

Stage 3: GFR 30 ml/min to 59 ml/min: moderate renal impairment.

Stage 4: GFR 15 ml/min to 29 ml/min: severe renal impairment

Stage 5: GFR<15 ml/min: kidney failure.

Urinary protein and blood determination

Blood: This test is based on the peroxidase like activity of hemoglobin, which catalyzes the reaction of diisopropylbenzene dihydroperoxide and 3,3',5,5'tetramethylbenzidine. The resulting color ranges from orange through green and very high levels of blood may cause the color development to continue to blue.

Protein: This test is based on the protein error of indicators principle. At a constant pH, the development of any green color is due to the presence of protein. Colors range from yellow for "Negative" through yellow green and green to green blue for "Positive" reactions.

Data quality was ensured through use of standardized data collection materials, pretesting of the questionnaires, proper training before the start of data collection and intensive supervision during data collection by the principal investigator. For laboratory analysis pre analytical, analytical and post analytical stages of quality assurance that is incorporated in standard operating procedures (SOPs) of the Tikur Anbessa clinical chemistry laboratory was strictly followed. In addition, well trained and experienced laboratory professionals were participate in the laboratory analysis procedure.

Data management and analysis procedures

Data entry and analysis was done using SPSS statistical software version [20]. The descriptive statistics was calculated & logistic regression analysis was done. Variables that show a significant association were selected for further analysis. In all cases P-value less than 0.05 was considered as statistically significant. The strength of the association was interpreted using an odds ratio in a 95% confidence interval. Finally, the results were presented using figures, and tables.

Ethical issues

This research project was approved by "Departmental Ethics and Research Committee" of the Department of Medical Laboratory Sciences, College of Health Science and School of Allied Health Science of Addis Ababa University. Permission was obtained from Tikur Anbessa hospital administrator. Informed verbal consent was obtained for each study subjects. Each respondent was informed about the objective of the study and assurance of confidentiality, risks and benefits. Only blood samples intended for study were drawn and thereafter discarded after analysis. The study results shall be disseminated to health care providers to aid in patient care.

Results

Out of 227 sample size, 219 (96%) of respondents who had at least one year follow-up at rheumatoid clinic at Tikur Anbessa Specialized and Teaching Hospital were identified and participated in the study.

A total of 219 respondents were interviewed and among all, 83 (37.9%) of the respondents were in the age range 25 years to 39 years and 78 (35%) were in age range of 40 years to 59 years, while 36 (16.4%) were above 59 years and 22 (10%) were in the age range of 15 years to 24 years. The mean age of the respondents was 43.82 years with Standard deviation (SD) of 14.03. Majority of respondents were 123 (56.2%) from Amhara ethinic group.

Regarding education status, 50 (22.8%) were illiterates (unable to read and write), 53 (24.2%) have attended primary education, 60 (27.4%) were in secondary education, and 56 (25.6) have attended college or university level education (Table 1). Majority of the study participants 189 (86.3%) had belief that the cause of the disease were unknown. While others 30 (13.7%) had strong belief that the cause of the disease reported as cold, curse, some viral disease and others.

Vast majority of the respondents 128 (58.4%), 54 (24.7%) and 37 (16.9%) live with the disease for the last one to five years, 6 years to 10 years and greater than 10 years respectively. The study revealed that 43 (19.6%) respondents have been reported RA in the family history

(Table 2). As presented in the Table 3, Majority of the respondents 90 (41.1%) and 72 (32.9%) have greater than 90 mL/min and 60 mL/min to 90 mL/min GFR result.

Among all subjects, 175 (79.9%) and 146 (67.1%) have normal urine protein and creatinine level which is less than one respectively. Majority 101 (46.1%) and 17 (7.8%) of the respondents have been developed deformity and swelling, while other have been reported normal body functions.

Variables		Frequency	Percentage (%)
Age	15-24	22	10
	25-39	83	37.9
	40-59	78	35
	>60	36	16.4
Marital status	Un married	55	25.1
	Married	120	54.8
	Other*	44	20.1
Level of education	Unable to read and write	50	22.8
	Primary	53	24.2
	Secondary	60	27.4
	College/University	56	25.6
Sex of the respondent	Female	165	75.3
	Male	54	24.7
Alcohol	Yes	53	24.2
	No	124	56.2
	Sometimes	42	19.2
Ethnicity	Amhara	123	56.2
	Oromo	53	24.2
	Tigray	13	5.9
	Others	30	13.7
*Divorced, widowed, separated			

Table 1: Socio demographic characteristics of respondents, Addis Ababa, 2016.

Variables	Frequency	Percentage
Perception on the cause of the disease		
Unknown	189	86.3
	30	
Having RA family history		
Yes	43	19.6
	176	
Smoking history		
Yes	26	11.9
	193	
Having regular exercise		
Yes	23	10.5
	159	
	37	
Work history of the respondent		
Government	62	28.3
Farmer	15	6.8
Housewife	58	26.6
Student	10	4.6
House made	6	2.7
Private	32	14.6
No work	36	16.4
Disease duration		
1-5 years	128	58.4
6-10 years	54	24.7
	37	
Respondent income		
Dependent	67	30.6
<1000 birr	63	28.8
1001-3000 birr	63	28.8
	26	

Table 2: Past history and clinical finding of the respondents, Addis Ababa, January 2016.

Variables	Frequency	Percentage (%)
GFR result in ml/min		
<15	3	1.4
15-29	8	3.7
30-59	38	17.4
60-90	80	36.6
>90	90	41.1
Creatinine (mg/dl)		
Abnormal	72	32.9
Normal	146	67.1
Urea (mg/dl)		

>50	4	1.4
<10	24	11
10-50	191	87
Urine protein		
≥ 1+	44	20.1
<1	175	79.9
Hematuria		
≥ 1+	9	4.1
<1	210	95.5

Table 3: Laboratory and clinical finding of the respondents, Addis Ababa, January 2016.

GFR CATAGORIES (ml/min)	Description	Percentage (%)
Stage 1 (GFR ≥ 90 ml/min)	Normal renal impairment	41.1
Stage 2 (GFR 60 ml/min to 89 ml/min)	Mild renal impairment	36.6
Stage 3 (GFR 30 ml/min to 59 ml/min)	Moderate renal impairment	17.4
Stage 4 (GFR 15 ml/min to 29 ml/min)	Severe renal impairment	3.7
Stage 5 (GFR<15 ml/min)	Kidney failure	1.4

Table 4: Kidney disease classification and result based on NKF classification, at Tikur Anbessa Anbessa Hospital, Addis Ababa, January 2016.

Variables	Frequency	Percentage
Types of medication used in the management		
Prediensolon, methotriexate, indomethacin and others*	89	40.6
Prediensolon	27	12.3
Indomethacin	30	13.7
Other NSAID+Prediensolon	54	24.7
Prediesolon and methotriexate	6	2.7
Methotriexate	13	5.9
Duration of medication taken		
<10 years	200	91.3
>10 years	19	8.7
*Other medication mean that medication used to manage other co-morbidity disease.		

Table 5: Drug used for RA treatment, at Tikur Anbessa Specialized Hospital, Addis Ababa, January 2016.

Most of the respondents 200 (91.3%), had been on taking medication less than ten years while other taking different medications above 10 years. The frequency of prediensolone, methotreixate, indomethacine and others is 89 (40.6%).

Multivariate logistic regression analysis was carried out by using a model of Hosmer-lemeshow goodness of fit test and enter modal to determine the most important statistically significant variables to look for strength of association as shown (Table 6). Result from bivariate analysis revealed that renal impairment associated with age of the study participant, sex, type of medication taking, duration of medication taken, urine protein and BMI significantly.

Out of the total covariate shows significant association in the bivariate, age of the study participant, sex, type of medication taking, duration of medication taken, creatinine level, urine protein and body mass index were significantly associated with renal impairment. But sex and duration of medication taken have no significant association in multivariate analysis.

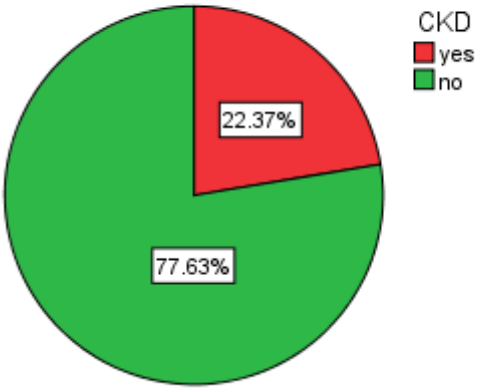

Figure 1: Prevalence of renal impairment among RA patients, Addis Ababa, January 2016. The prevalence of 22.37% with mean and SD [1.78 ± 0.418 SD].

Age of rheumatoid arthritis patient was one of strong factors associated with renal impairment. The study shows that older age greater 59 years old AOR (95%CI): 24.15(2.09, 279) p-value 0.02, age 40-59 AOR (95%CI): 3.22 (1.01, 10,234), age 25-39 AOR (95%CI): 3.97 (1.22, 12,936) were more likely developed renal impairment than younger (15-24) respectively.

Patients who have taken more than two type of medications had 8.16 times more likely to develop renal impairment than who has taken one type of non-steroidal anti-inflammatory drugs or methetroxin or predinsolon drugs or other steroidal drugs AOR (95%CI): 8.16 (2.38, 28.05).

The level of urine protein as determined by dipstick was associated with the degree of renal impairment. Urine protein level greater than one AOR (95%CI): 1.93 (1.68, 5, 53) were more likely developed

kidney disease than protein level less than one. Body mass index of rheumatoid arthritis patient was one of strong factors associated with renal impairment. This study shows that those who have body mass index greater 25 are AOR (95%CI): 0.01 (0.02, 0.45), p-value of 0.03 less likely develops renal impairment.

Factors	Renal Impairment		Crude OR		Adjusted OR	
	eGFR ml/min n<60	eGFR ml/min n>60	Pvalue	OR 95%CI	P-value	OR 95%CI
Age						
>59	1	21	0.02	7.14 (1.45,35.29)	0.02**	24.15 (2.09,279)
40-59	16	67	0.01	4.23 (1.72,10.41)	0.05**	3.22 (1.04,10.24)
25-39	16	62	0.12	1.94 (0.85,4.45)	0.02**	3.97 (1.22,12.94)
18-24	16	20	1			
Sex						
Female	44	121	0.01	3.56 (1.33,9.52)	***	***4
Male	5	49	1			
No. of medication type ≥ 2 medication	43	89	0	6.52 (2.64,12.05)	0.00*	8.16 (2.38,28.05)
Only one	6	81	1			
Duration of medication						
>10	10	9	0	4.20 (2.01,8.57)	***	***
<10	39	161				
Urine protein						
≥ 1+	20	24	0	4.20 (2.01,8.57)	0.02*	1.93 (1.68,5.53)
<1	29	146	1			
BMI						
<18.5	20	31	1			
18.5-24.5	24	108	0.57	0.73 (0.08,0.75)	***	***
>25	5	31	0.01	0.25 (0.26,2.06)	0.03*	0.1 (0.02,0.45)
NB:* significant < 0.01, ** significant < 0.05, *** not significant						

Table 6: Bivariate and multivariate analysis of factors associated with renal impairment on RA patients, at Tikur Anbassa Teaching and Specialized Hospital, January 2016, Addis Ababa.

Discussion

Prevalence value of 22.4% renal impairment was observed in this study. This is higher than the study conducted before which was 18% [25] and 12.75% in Europe [26]. However, it is a bit lower than similar study conducted in Kenya that was resulted 28% [1]. Majority of the study participants' age distribution in this study were older than 40 years of age 114 (52%) with mean age 43.82 years and standard deviation of 14.03 which is significantly lower than related studies conducted abroad. The study subjects considered in our study were younger than subjects participated in related studies in Kenya, France, USA and England with a mean age of 48.7 years, 55.2 years, 56 years and 61.6 years respectively [26-28] and nearly one fourth, 91 (41.6%) have been living with RA for the last 6 years to 40 years.

The higher prevalence of kidney disease among Africans has been attributed to genetic predisposition, low socio-economic status and inequities in access to health care [14]. This is possibly supported by majority 130 (59.4%) of study participants have no income or less than 1000 birr per month. Duration of disease and first visit of modern health care registered with mean of 7.32 and 1.38 respectively. This shows that health seeking behavior of study participant significantly varies from the Kenyan study [1].

High incidence of kidney disease in our study might be explained by late coming of patients to modern health care treatment after attending traditional healer, spiritual care, habitual consumption of analgesics and disease progression. The finding of this research revealed that age of study participant was one of strong predictors associated with kidney disease. This is consistent with studies in [1,26]. And the older the patient the significant is the risk propensity of kidney disease than younger age. This might possibly be explained by the fact that old age is a known independent risk factor for kidney disease. As age increases there is a gradual decrement in the nephrons number and associated decline in glomerular filtration rate.

The average rheumatoid arthritis patient has approximately 1.6 co-morbidities and the number increases with the patient's age may be expected more. And a variety of renal disorders can occur in patients with rheumatoid arthritis due to the underlying disease to drugs used to treat the inflammatory process and to concurrent renal disease unrelated to rheumatoid arthritis which is more likely in elderly patients [17].

Drug induced protein urea was associated with age over 50 years and elevation of C-reactive protein levels. Even though we did not include hypertension and diabetic mellitus, other studies show that the prevalence of hypertension and diabetic mellitus among rheumatoid arthritis patients are higher as compared to age and sex matched controls a finding in the general population. The study shows that sex of study participant was not significantly associated in multivariate analysis. This is against study in Helsinki and Russia. This might be possible explained by age of female study participant even if the incidence of rheumatoid arthritis was common among female sex. The prevalence of kidney disease in Helsinki significantly associated with the problem than this study. This might be because of the fact that the mean age of study participants in Helsinki was higher than this study. The mean age of this study is less than other similar studies done [1, 27].

Duration of medication taken was significant in the bivariate analysis. However, it was not as such significant in the multivariate analysis but patient who have taken more than two type of medication were more likely to develop renal impairment. This is inconsistent with Kenyan study [1]. In our study, rheumatoid arthritis patients who have been taking combination of three type medication like that of predinsolon, methotrixate, indomethaxin and other were significantly associated with renal impairment.

Use of either one or combination of two predinsolon, methotrixate, non-steroidal anti-inflammatory drugs were not correlated with renal impairment. And lack of association might be explained due to drug compliance by our study population although this was not assessed by this study [1]. Since this cross sectional study affected by chicken-egg dilemma or can't establish cause effect relationships we are not able to establish cause of renal impairment among the drugs.

The association might be confounded by habitual analgesic intake for management of pain which is un-prescribed by clinician [28]. This is true in all countryside of Ethiopia and it is also supported by different authors who have cited the habitual consumption of analgesics or analgesic abuse as contributing to the increasing nephrotoxicity contribute to high prevalence of kidney disease.

Finally, other possible general explanation might be the attributed by other drugs use manage for co-morbidity in rheumatoid arthritis patients. More number of drugs shows that disease severity in rheumatoid arthritis was uncontrolled disease activity. The fact that a given patient uses poly-pharmacy could indicate that the disease is uncontrolled or the time of the drug combination is delayed and enhanced disease activity and renal injury. The blood urea was 28 (12.8%) and it was not significantly associated with renal impairment. Concomitant elevations of blood urea imply renal excretory failure but only at an advanced stage of kidney damage. Hematuria, proteinuria and creatinine are sign of abnormal clinical findings. The clinical finding shows that hematuria and proteinurea was 9 (4.1%) and 44 (20.1%) respectively and proteinuria and hematuria, as detected by urine dipstick analysis, is suggestive of glomerulonephritis and massive proteinuria is a hallmark of membranous lupus nephritis, amyloid-A amyloidosis or certain drug toxicities [28].

Abnormal serum creatinine level of the study was 72 (32.9%). Most studies show that creatinine is not credible measurement. However, the use of serum concentration of creatinine as an index for the glomerular filtration rate [24]. Urine protein level was one of factors correlated with renal impairment in this study. This is similarly to study consucted in South Africa and Finland [7]. Macro protein in the urine is one of sign glomerular injury according to different studies. Production of protein in the urine (protienuria) might be explained by systemic rheumatoid arthritis related vacuities, glomerular injury and micro vascular injury related to co-morbid chronic medical conditions. So, the longer the duration of protienuria is the more the kidney disease progression [24].

High value body mass index is one of basic parameter used to measure risk chronic degenerative disease like hypertension, diabetic mellitus and then consequently chronic kidney disease. But according to this study, participant with body mass index greater than 25 were less likely develop renal impairment. It was found to be statistically significantly associated with renal impairment in this study. This is inconsistent with study in South Africa. This is possibly explained by the inverse relationship of body mass index and eGFR calculation. Even if the association of body mass index and renal impairment are statistically significant in this study it is not enough to establish cause-effect relationship and biological plausibility.

Conclusions

This study indicates that the prevalence of renal impairment among study participants was high. Though protein-urea can be from different causes, it is a marker of progression in renal impairment.

Old age is a known independent risk factor for renal impairment irrespective of the underlying diseases. As age increases there is a gradual decrement in the nephrons number and associated decline in glomerular filtration rate.

The three drugs listed above, protein-urea and body mass index were found to be significantly associated with renal impairment. This still implies that patients with rheumatoid arthritis require screening for kidney disease, regular monitoring of progression and initiation of appropriate management especially with long-term follow up.

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