Original Article

Relationship Between Microalbuminuria and Activity of the Disease in Patients Suffering from Ulcerative colitis

Murad Ali[1], Maryam Ashfaq[2], Tariq Tahir Butt[3], Bushra Gohar Shah[4*] and Hammad Ur Rehman Bhatti[5]

[1]Department of Medicine, Bacha Khan Medical College, Mardan, Pakistan
[2]Pakistan Institute of Medical Sciences, Islamabad, Pakistan
[3]Department of Medicine, Sialkot Medical College, Sialkot, Pakistan
[4]Department of Physiology, Sahara Medical College, Narowal, Pakistan
[5]Department of Medicine, Islam Medical and Dental College, Sialkot, Pakistan

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Corresponding Author:

Bushra Gohar Shah
Department of Physiology, Sahara Medical College, Narowal, Pakistan
drbushragoharshah@gmail.com

ABSTRACT

Ulcerative Colitis (UC) is a gastrointestinal issue, in which inflammation of the tract takes place. The disease level may be severe, moderate, or mild, so the detection method was selected according to the disease level. Finding the disease level and diagnostic method of UC is challenging. **Objective:** To find out a non-interfering way for the assessment of the activity of the disease, which is particularly important for the detection of UC. Therefore, the main goal of this study is to find a safe method for the determination of disease severity in the patients suffering from UC. **Methods:** For this study, 93 patients were selected suffering from UC (UC). For the assessment of all the specific parameters, C-Reactive Protein (CRP), Rate of erythrocytes sedimentation (ESR) and calprotectin in fecal, commonly used turbidimetric-immunoassay, Enzyme-linked immunosorbent assay (ELISA) and Westergren technique was used. A partial clinical score was used for the estimation of disease severity and the level of microalbuminuria was used determined by the immuno-turbidimetric way. **Results:** Among 93 patients suffering from UC, 37 patients were male and 56 patients were female. The average age of the patients was 40 plus. Microalbuminuria was present in more than 52 % of the patients. The presence of microalbuminuria depends upon the severity level of the disease, the most severe patients with Inflammatory bowel disease (IBD) have a large amount of microalbuminuria. The CRP, rate of sedimentation of erythrocytes, and other proteins level also vary with disease level. **Conclusion:** To measure the activity or severity level of the UC, microalbuminuria is considered a safe or non-interfering marker.

INTRODUCTION

Ulcerative colitis (UC) is caused by inflammation, some parts of the tract may rupture. The level of the disease varies, it may be severe, moderate, or mild. For the treatment of UC, the disease level is considered first. It is quite difficult to estimate the activity level of the disease. For the estimation of disease, biopsy and endoscopy can be done, it can also be used for diagnostic purposes [1-4]. Several different other factors are studied for the estimation of disease progression levels. Among these factors, C-reactive protein (CRP), rate of erythrocytes sedimentation (ESR), and calprotectin are most common.

As a result of microalbuminuria, inflammation takes place in different parts of the gastrointestinal tract, the inflammation of these parts indicates the malfunction of the vascular system and initiation of many kidney-related issues. Sometimes, rheumatoid arthritis is also considered an indication of UC. When the disease caused by microalbuminuria became severe, it leads to the condition termed inflammatory bowel disease (IBD). Microalbuminuria has a link with the histopathology of the intestine [5-9]. The level of microalbuminuria varies in different disease levels, different methodologies are tried

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and a number of research groups are trying to find the best possible method for the identification of the progression level of the disease [10]. Different other non-toxic confirmatory characteristic indicators are also estimated to find the inflammatory region within the gastrointestinal tract and to find out the relation between inflammation and microalbuminuria. Only at a limited level, these studies are being done in different labs, but still, more work is needed to find out the non-invasive methods for the identification of the severity level of the disease as well as to find out the more related methods for the identification of UC more accurately [11-15].

METHODS

It was a retrospective study conducted at medicine department of Sialkot Medical College for the duration of six months from December 2020 to May 2021. To proceed with this study 93 patients were selected, all of the patients were suffering from an infection of the gastrointestinal tract, and further, their infection was confirmed by an available diagnostic test which reveals that all of them are suffering from UC with the different disease severity level. Among these 93 patients, 37 were males and 56 females. The age of the patients was also considered, all of the patients had an average age of more than forty years. Some of the patients also had inflammatory bowel disease, and some of the patients have a number of diseases associated with the gastrointestinal tract such as microalbuminuria, which also comprised of diabetes, thrombosis, and the number of disorders related to the kidney such as nephrotic disease, amyloidosis, and renal vein inflammation. 94 % confidence level was considered for the estimation of sample specimen size. For microalbuminuria level 0.8 standard difference was kept for the different groups. For 93 patients, attrition rate was 30 % for the patients having more severe disease levels. All the related parameters were calculated for all patients. Verbal and written information was taken from the patients on the behalf of their consent. To measure the UC activity rate, a partial clinic score was used. The respective score for each patient was calculated on the basis of different factors like bleeding through the rectum, frequency of stool, and physician prediction about the severity level of the disease. Each of the levels was given a score from 0 to 3. The lowest score was 0 for mild, 1 for moderate, 2 for severe, and 3 for more acute levels. The disease score was predicted by estimation of all the related factors, usually, 3 factors are considered mainly as mentioned above. For the estimation of the level of the microalbuminuria immunoturbidimetric method was used. The level of microalbuminuria was measured two times in two days consecutively, then the average of both values were taken

for the estimation of microalbuminuria. CRP level and ESR were also calculated for the prediction of final results by using different immune-based assays like ELISA. Then for the prediction of the final results, statistical tests were applied. For different values, the average was taken as well as standard deviation was also calculated, and the one-way ANOVA was also performed to compare microalbuminuria level and its association with the progression of the disease. The p-value of 0.05 was selected to obtain significant results.

RESULTS

Table 1 shows the characteristics of all patients participated in this study. There were total 93 patients that contributed in this study. Among 93, 37 (39%) were male and 56 (60%) were female. The average age of the patients was 40 years ± 13 years. Among the 56 female, 53% had albuminuria. The rate of this disease was much high in patients that had active illness in comparison with patients that ha inactive form of IBD.

Characteristics	Total participants (93)	Active (47)	Inactive (46)	p- value
Age in years	40 years ± 13	44 ± 13	4100 ± 14	0.6
Sex of patients				
Male	37 (39%)	17 (36%)	19 (40%)	0.9
Female	56 female (60%)	29 (61.2%)	28 (59%)	
Microalbuminuria				
Disease cases	46 (50%)	47 (100%)	8 (7%)	0.005
Negative	44 (48%)	0 (0%)	43 (92%)	
Extra intestinal manifestation				
Positive patients	3 (25%)	15 (31%)	8 (17%)	0.14
Healthy	67 (76%)	33 (70%)	38 (83%)	

Table 1: characteristic features of participants

Characteristics	Total participants (mean ± SD)	Active (mean ± SD)	In-active (mean ± SD)	p- value
CRP (in ng / L)	4.2 ± 3.2	5.87 ± 1.08	0.37 ± 0.33	< 0.005
ESR (mm / hr)	36.52 ±34.5	560.2 ± 14.9	5.77 ± 3.09	<0.001
Urinary albumin mg / L	99 ± 110.1	198.1 ± 76	12.1 ± 13.2	<0.55
Urine creatinine mg / d L	950.1 ±20	970.1 ± 193.3	934 ± 261.3	<0.05
Serum calprotectin in ng / ml	0.1331 ± 370.1	650 ± 261.1	13.1 ± 11.1	<0.001

Table 2: Laboratory characteristic comparison between active and inactive participants suffering from UC

Table 2 shows the values of laboratory profiling comparison done between the patients that contributed in this study. It was observed that there were quite high significance noted among patients with active and patients with inactive disease. (p= 0.05) exception was seen in case of urine creatinine (p= 0.05).

Characteristics	N	Mean
Remission score	32	11.0 ± 13.11
Mild and moderate activity	26	95.1 ± 15.1
Intense activity	27	219.1 ± 18

Table 3: Urine albumin level comparison with the severity of UC

DISCUSSION

In this study, the rate of microalbuminuria is checked in patients with UC and it is then correlated with the activity of the disease. As per our studies, there were 53 patients that were included in the study that suffered from albuminuria. According to some previous studies, 52 % of the patients that had IBD also had proteinuria [16-18]. Babayeva and his fellows found that in 60% of their patients with UC, the incidence of albuminuria was seen. In a study carried out by Mahmud and his fellow workers, there were 100% patients that had microalbuminuria and IBD at the same time. The different observations found by scientist in these studies may be because of different degree of severity of the disease, like the marker of proteinuria, Crohn's illness vs UC and the use of any other form of drug by the person [19]. As per previous findings the level of CRP and the condition of microalbuminuria are strongly linked to each other in case of UC patients. However, in a study carried out by Muhmud and his fellows they found that there is need to check the link between microalbuminuria and the activity of the disease in case of UC patients [17]. In another study carried out by Herrlinger and his colleagues, they found that there exists prominent sort of link between proteinuria and the activity of disease in patients that are suffering from IBD [18]. Derici and his fellows later on reported that there is present a very strong variation in the albumin levels in the urine among the patients that are suffering from active form of UC if its compared with the control [10]. Moreover, they also told that the differences that were found between the patients actively suffering from disease and the patients that have in active disease are not statistically significant [19]. The differences that were found between different studies are mainly due to variations in a lot of parameters like drug administration, activity of the disease and the status of the inflammation in case of patients. There are a number of mechanisms that can help explain why such variations exists among patients [20].

One of the proposed assumption says that the mechanism that will causes association between activity of disease and microalbuminuria in UC patients is may be due to enhanced levels of cytokines. These cytokines can play a significant role in disturbing the mucosal sulphated compounds glycosaminoglycan that are present in the renal microvasculature where they speed up the vascular permeability of the albumin [21-23]. According to these studies, there are some of the limitations that could be improved to get better results. One of the limitations is that

in the mentioned study the activity of the disease was measured by using a MC score (mayo clinic score). Though there is no doubt that this is one of the most reliable and valid methods which can tell us about the activity of the disease but still if we could use a more reliable method, or more valid ways that can help provide us information about the disease activity in UC patients then the results could be improved in a much better way. Like if histological grading was done for the patients it can help decide results with more precision [24]. Also in this study one more point to consider was that the effect or response of different sort of drugs on level of microalbuminuria should also be checked. In this study the data was analyzed by using immune-turbidimentric ways. First sample was checked in the morning repeatedly for two days. Then mean was considered as a value reported as urinary level of albumin. On the basis of National Renal association criteria, the serum calprotectin level, CRP, ESR were calculated by using the conventional ways of immunoassays. To check the significance of non-invasive lab characteristics that can predict about the degree of the disease and the rate of inflammation and then the strong link between disease activity and microalbuminuria in UC patients ESR and CRP were used. The aim was to look for the disease activity index and the degree of albuminuria in persons suffering from UC.

CONCLUSION

The findings show that the microalbuminuria can be used as a marker for finding the activity of the disease in case of UC patients. However, there is need for further longitudinal studies for further confirmation.

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