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Prevalent of Post streptococcal Infections among renal failure patients in Khartoum state

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Abstract:

Streptococcus pyogenes, group A beta hemolytic gram positive cocci produces different diseases conditions one of them is pharyngitis and tonsillitis. Recurrent and incurable infection may result in post – streptococcal infection one of them is Rheumatoid fever which can be diagnosis by an increase in the ASO antibodies patients serum. This study aimed to detect antistreptolysin (O) and (RF) among renal failure patients in Sudanese hospitals. 100 Serum samples were taken from patients infected with renal failure, subjected for determination of Anti-Streptolysin O (ASO) titer and rheumatoid factor.(RF) titer by latex. Agglutination. (Quantitative &semi Qualitative). In qualitative method of (ASO) 16 serum samples were show positive for ASO ranging from (1:2-1:16) in semi quantitative while 85 samples as negative cases in (RF) 15 serum sample were positive for qualitative ranging from titer from(1:2-1:16) in semi quantitative method while the 85 sample showed negative cases. The study was show insignificant rang for (ASO) and (RF) for renal failure.

Key words: Post streptococcal Infections, renal failure patients, Khartoum state

INTRODUCTION

The kidneys are organ that serve several essential regulatory roles in human body. They serve the body as a natural filter of the blood content, and remove wastes which are diverted to the urinary bladder. In producing urine the kidney excrete wastes such as urea and ammonium, and they are also responsible for the re-absorption of water, glucose and amino acid [1]. Kidney functions tests are group of test are used to screen for and manage renal disease. Test commonly used for this purpose are plasma creatinine, blood urea nitrogen (BUN) electrolytes, and routine urinalysis. The glomerular filtration rate is the volume of fluid filtered from glomeruli in to bowman's space per unit time. It is approximately 125ml/min in the average –sized 70kg healthy male [2]. Renal failure is a condition where the kidney fails to function properly, physiologically, renal failure from is described as decrease in the glomerular filtration rate [3]. Post renal failure results from obstruction of urine outflow from the kidneys. The genus of streptococcus consists of gram positive aerobic bacteria which appear as chains the under microscope [4]. *Streptococcus pyogens*, or group A Streptococcus (GAS),is facultative, Gram positive cocci which grows in chain and causes numerous infections in humans including pharyngitis, tonsillitis , scarlet fever, cellulitis, erysipelas, Rheumatic fever, Post –Streptococcal golemerulonephritis , necrotizing facilities, myonecrosis and lymphangitis[5]. Streptolysin O Is produced by most strains of group A streptococci and many strain of group C and G and is inactivated by oxygen, is the toxic to red and white blood cell and various tissue culture cells after pharyngeal or systemic infection[4].

MATERIALS AND METHODS:

This descriptive case study is carried out to determine common group A beta hemolytic streptococcal association from renal failure diseases in Khartoum State –Sudan, in the period from January to March 2016, the clinical data was record by using structural interview questionnaire. 100 patients with renal failure were participated in this study.

Sampling and Methodology:

Three ml of venous blood were collected in sterile plain container from hospitalized patients suffering from renal failure. Blood samples were transported to the laboratory. of microbiology in Al-Yarmouk college for separation of serum by centrifuge at 1500 RPM from 5-10 min and serum will be subjected to serological test.

Methodology:

AntistreptolysinO titer for latex (ASO):

Principle:

The ASO-latex is a slide agglutination last for the qualitative and semi -quantitative detection of anti-streptomycin O (ASO) antibodies. Latex particles coated with streptomycin O were agglutinated when mixed with samples.

Reagents

Reagent A: Latex ASO in suspension containing sodium azids 0.95g/l.
Reagent B: Positive control
Reagent C: Negative control

Qualitative

Qualitative Determination	
Add in different circles of the slide:	
Serum to be tested	1 drop
Positive control	1 drop
Negative control	1 drop
In all circles add:	
ASO latex reagent	1 drops

Mixed and spread with the stirring rod to fill the test circles. Slide was rotated and agglutination occurred within two minutes.

Semi-Quantitative

Prepare sample dilution with saline 1:2, 1:4, 1:8, and 1:16. Test each dilution according to the qualitative procedure until no further agglutination is observed .The RF concentration can then be estimated from the last dilute with visible agglutination.

Rheumatoid factors (RF) for latex

Principle

The RF-latex is a side agglutination test for the qualitative and semi –quantitative detection of RF in human serum. Latex particles coated with gamma globulin are agglutinated when mixed with samples containing RF.

Reagent

Reagent A: Latex RF in suspension containing sodium azids 0.95g/l.
Reagent B: Positive control
Reagent C: Negative control

Qualitative

Qualitative Determination	
Add in different circles of the slide:	
Serum to be tested	1 drop
Positive control	1 drop

Negative control	1 drop
In all circles add:	
RF latex reagent	1 drops

Mix and spread with the stirring rod to fill the test circles. Rotate the slide and observe for any agglutination which should occur within two minutes.

Semi-Quantitative

Samples were diluted with saline 1:2, 1:4 and 1:8. Test each dilution according to the qualitative procedure until no further agglutination is observed .The RF concentration can then be estimated from the last dilute with visible agglutination .RF (IU/ml)=Highest dilution with positive reaction x reagent sensitivity (8IU/ml).

RESULTS:

The current study was conducted on (100) patients with renal failure, 57 were male and 43 were female ranging from (25-80) years old. Serum samples collected from these patents to estimate anti-streptomycin O (ASO) titer and rheumatoid factor (RF). Related to ASO by qualitative methods (16) samples were positive (16%) comprised of 7 males (12,2%)out of (57)with male infective rate(43.75%)and 9 female (20,9%)out of (43)with female infective rate (56.25%)negative samples were (84%)consist of (50) male and 34 female with percentage (87.8%and 79.1%)respectively.(Table1)(p.value 0.9). Correlation of ASO by semi quantitative methods with gender and age were shown in (Table 2, 3).ASO tests showed ranging from (1:2 to 1:16) (2. 1. 4. 2), high in female, different distribution of ASO titer related to age group (25-45) years.

Related to RF by qualitative methods (15) samples were positive (15%) comprised of 7 males (12,2%)out of (57)with male infective rate(43.75%)and 8 female (18.6%)out of (43)with female infective rate (50%)negative samples were (84%)consist

of (50) male and 34 female with percentage (87.8%and 81.4%)respectively.(Table4,5)(p.value 0.3). Correlation of RF by semi quantitative methods with gender and age was shown in (Table 4, 5). RF tests showed ranging from (1:2 to 1:16) high in male, different distribution of RF titer related to age group (66-80) years.

Table (1): Relationship between ASO & RF with gender:

Genders	ASO			R.F		
	Positive	Negative	Total	Positive	Negative	Total
Male	7 (43, 75%)	50(59, 53%)	57(57%)	8(53.4%)	49(57, 6%)	57 (57%)
Female	9(56, 25%)	34 (40.47%)	43(43%)	7(46,6%)	36(42.4%)	43 (43%)
Total	16(100%)	84 (100%)	100(100%)	15(100%)	85(100%)	100 (100%)
p.value	0.9			0.3		

Table (2): ASO Titer with Gender:

	Gender					
	Male		Female		Total	
	Count	%	Count	%	Count	%
ASOtiter						
1\2	2	28.6%	2	22.2%	4	25%
1\4	0	0%	1	11.2%	1	6.3%
1\8	3	42.8%	4	44.4%	7	43.7%
1\1	2	28.6%	2	22.2%	4	25%
Total	7	100%	9	100%	16	100%

Table (3): ASO Titer with Age:

	Patients age							
	25-45		46-65		66-80		Total	
	count	%	count	%	Count	%	Count	%
ASO titer								
1\2	2	22.2%	1	25%	0	0%	3	18.75%
1\4	1	11.2%	0	0%	0	0%	1	6.25%
1\8	3	33.3%	3	75%	2	66.6%	8	50%
1\16	3	33.3%	0	0%	1	33.4%	4	25%
Total	9	100%	4	100%	3	100%	16	100%

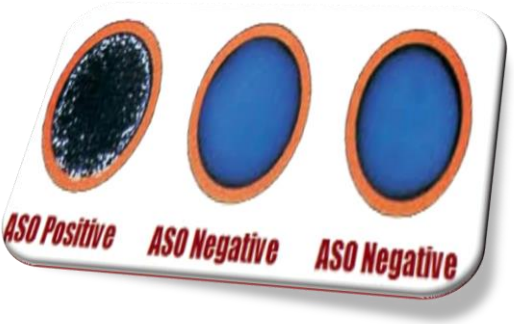
Table (4): RF Titer & Gender:

	Gender					
	Male		Female		Total	
	Count	%	Count	%	count	%
RF titer						
1\2	2	25%	2	28 .5%	4	26.6%
1\4	2	25%	0	0%	2	13.4%
1\8	2	25%	5	71.5%	7	46.6%
1\16	2	25%	0	0%	2	13.4%
Total	8	100%	7	100%	15	100%

Table (5): RF Titer with Age:

	Patients age							
	25-45		46-65		66-80		Total	
	Count	%	count	%	Count	%	Count	%
RF titer								
1\2	2	0%	1	25%	1	16.7%	4	26.6%
1\4	1	20%	0	0%	0	0%	1	6.6%
1\8	2	40%	2	50%	4	66.6%	8	53.4%
1\16	0	0%	1	25%	1	16.7%	2	13.4%
Total	5	100%	4	100%	6	100%	15	100%

ASO Tests:



DISCUSSIONS:

In this study out of 100 samples from patients with renal failure 16 samples had been positive to Anti-sreptolysin O .The patients aged from (25 to 45) years comprised the most group showed high infective rate with high ASO titer (9 females &

males). Previous study are stated that nephritis associated plasmin receptor (NAPLR) a group A streptococcal antigen, was found primarily in the glomerular mesangium of patients with early – stage acute post- streptococcal glomerulonephrities[6]. When streptococcal infection and renal disease marker had studied in Australian aboriginal children, that group A streptococci are important causes of impetigo in those children. Streptococcal infection may contribute to glumerular hematuria, proteinuria and persistent glumerulonphritis in than and possibly to chronic glumeroloephritis in adult life [7]. Fifteen samples out of total (100) patients had RF titer in different age groups, being more in group ranging from (66-80 years).Clinically manifest renal involvement in RF has been commonly attributed to (secondary) amyloidosis, and renal vasculit is. Patients of RA receive (NSAIDs), at some time or the other during the course of their illness. Disease modifying anti- rheumatic drugs (DMARDs), like gold and penicillamine are also nephrotoxic. It is therefore difficult to ascertain the true incidence of renal involvement due to RA itself [8]. There is evidence that both functional abnormalities and histopathological lesion that cannot be attributed to concomitant drug intake or to vaculties or amyloidosis do occur in RA patients. Boers in his review classified renal disorders into three categories-those due to RA and its complications, hose related to drug therapy and a third. category" RA nephropathy[9].

CONCLUSIONS

Rheumatoid factor found in a higher ranged between (60-80years), which may lead to high pathological and functional abnormality among those patients.

By using latex agglutination test we found that percentage of (16%) comprising (16) one out of 100 patients

studied had positive anti-streptolysin O titer ranging (1:2-1:16). While others were negative and in renal failure were positive for rheumatoid factor using the same test with titer of (1:2-1:12) while the other is negative. While the anti-streptolysin O and rheumatoid test were positive for same tests in only two of renal failure patients.

RECOMMENDATIONS

Recurrent infection with group A streptococcal especially during the childhood period should be treated to percent occurrence of post streptococcal infection as rheumatic fever and glomeulornephritis in adult life whish may end renal failure.

Early diagnosis of rheumatoid fever with rheumatoid factor can seeded as an important to prevent early to detect the rheumatoid factor especially in children

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