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*Full Length Research Paper*

# Frequency of rheumatoid factor and serum uric acid in asymptomatic elderly individuals at Khartoum state, Sudan

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**Aim of the study:** This study aimed to determine rheumatoid factor and serum uric acid among Asymptomatic elderly individuals above 60 years of age. **Methods:** A total number of 103 individuals were screened for rheumatoid factor (RF), uric acid (UA) and erythrocyte sedimentation rate (ESR) by using slide agglutination, enzymatic method and westergren tubes, respectively. **Result:** Of the 103 individuals tested, 10 (9.7%) were rheumatoid factor reactive most of them 6/10 (60%) were females. Twenty-two participants (21%) showed an elevated uric acid level ( $\geq 7.7\text{mg/dl}$  and  $\geq 6.8\text{mg/dl}$  for males and females respectively); two of them were RF reactive. Among the ten rheumatoid factor positive individuals, elevated Erythrocyte sedimentation rate (ESR) was noticed in 9 with 5 having elevated ESR level of more than 50 mm/hr. Significant correlation has been detected between elevated serum uric acid and ESR (P value 0.046). **Recommendation:** It's highly recommended to screen periodically any elderly individuals (above 60 year) for serum uric acid and rheumatoid factor, which might help in early diagnosis and avoid any complication and co morbid diseases.

**Keywords:** Rheumatoid factor, elderly and Khartoum state

## INTRODUCTION

Rheumatoid factor (RF) is an autoantibody secreted by B lymphocytes against the crystalline Fragment (Fc) of immunoglobulin G (IgG) (Cruise and Lewis 2004). It combines with the Fc part of the IgG leaving the molecules free to combine with its homologous antigen or with more antibodies to form large complexes. These aggregates can

become an immunological problems by activation of the complement system with the production of neutrophils chemotactic factor (C5a), or the aggregated IgG-rheumatoid factors are phagocytosed by macrophages and neutrophils (rheumatoid arthritis cells [RA cells] (Hyd 1995; Kaplan 2013).

The rheumatoid factor is present in 75% of adults who have rheumatoid arthritis at the onset of the disease, this percentage increases to 85% during the first 2 years of the disease (Wilson 2006).

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**Table 1:** The association of rheumatoid factor and gender:

		Rheumatoid factor		Total	P value
		Positive	Negative		
<b>Gender</b>	Male	4	49	53	0.518
	Female	6	44	50	
<b>Total</b>		10	93	103	

Many manuscripts showed that Rheumatoid factor is present in rheumatoid arthritis years before clinical symptoms are occurred (Deane et al. 2010). Its estimated that 14.1% of healthy elderly populations have positive rheumatoid factor (Manoussakis et al., 1987). In another study, rheumatoid factor were significantly more prevalent in elderly patients with chronic illness however, rheumatoid arthritis was not specific for any diseases and therefore the clinical significance of auto antibodies in elderly patients is more related to global health status than to effect of aging (Juby and Davis 1998). The prevalence of rheumatoid factor in successfully aging, chronically ill elderly, and chronically ill aging less than 65 years, was found as 11.8 %, 21.5% and 14.8 %, respectively. This indicates significant relationship between rheumatoid factor positivity with chronic illness and elderly (Önen et al., 1998).

Gout in elderly is a common illness, which has high comorbidity and mortality factors. Chowalloor et al described the incidence of high uric acid among elderly and the risk factors associated with the disease (Chowalloor et al., 2013). While several authors describe asymptomatic hyperuricemia with coronary heart decalcification and coronary heart disease (Kim et al., 2017; Wu et al., 2017).

This study aimed to determine the frequency of rheumatoid factor and elevated uric acid among asymptomatic Sudanese elderly individuals above 60 years of age and to determine the relationship between asymptomatic rheumatoid factor positive participants with serum uric acid and ESR.

## MATERIALS AND METHODS

### Samples collection:

A quantitative approach in community based analytical biomedical study by measuring the frequency of rheumatoid factor, uric acid, and erythrocyte sedimentation rate in 103 randomly selected elderly (above 60 years) apparently healthy individuals. The study was based on a standardized questionnaire and laboratory investigation. Blood sample was collected from each participants in Trisodium citrate and plane containers.

### Processing of samples:

Rheumatoid factor was measured from serum samples using rheumatoid factor latex agglutination kits (Biosystems™). Fifty microlitre of serum sample, positive and negative control were deposited on separate circles of black card. A drop of rheumatoid factor latex antigen was mixed with each reactants and examined for the appearance of visible agglutination within one minute after rotation.

Serum uric acid was measured by colorimetric method using enzymatic method (Cypress Diagnostic™). Erythrocyte sedimentation rate was performed manually using westergren tube.

### Ethical consideration:

Signed informed consent was collected from each participants with agreement of his participation in this research.

## RESULTS

This study included 103 randomly selected and apparently healthy elderly with an age range between 60 to 101 years old. All participants were tested for rheumatoid factor, erythrocyte sedimentation rate and uric acid.

Rheumatoid factor was detected in 10 (9.7%) of the participants, six of them (60%) were females (Table: 1). Most of the positive rheumatoid factor participants had high erythrocyte sedimentation rate (ESR), four (40%) of them had 21-50mm/hour, five (50%) have more than 50 mm/hour and only one (10%) have less than 20mm/hour (Table:2).

Elevated uric acid ( $\geq 7.7$ mg/dl for male,  $\geq 6.8$ mg/dl for female) was found in 22 (21%); two of them were rheumatoid factor positive (Table: 3).

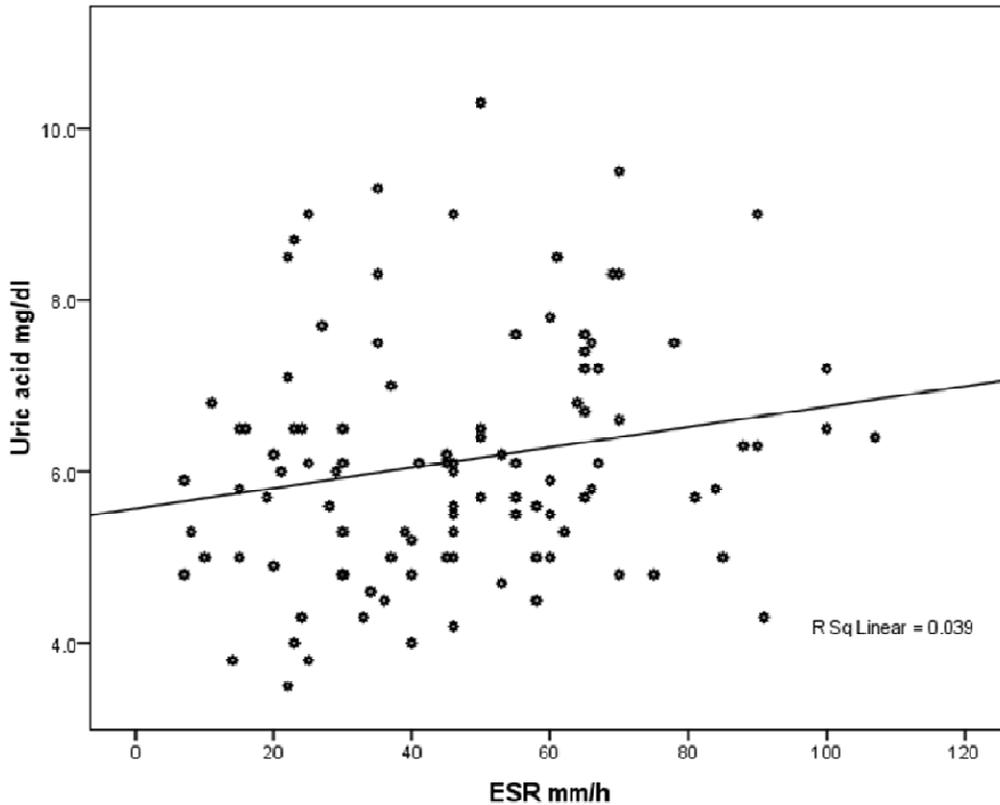
There was statistically significant correlation (P value 0.046) between ESR and level of serum uric acid. In contrast, the relation is insignificant between rheumatoid factor and gender (P value 0.518) ESR (P value 0.821) and uric acid (P value 0.912) (Figure: 1).

**Table 2:** The association of rheumatoid factor and ESR

		Rheumatoid factor		Total	P value
		Positive	Negative		
ESR	Normal <20	1 (10%)	12 (12.9%)	13 (4.4%)	0.821
	Moderate 20-50	4 (40%)	44 (47.3%)	48 (46.6%)	
	High >50	5 (50%)	37 (39.8%)	42 (40.7%)	
<b>Total</b>		10	93	103	

**Table 3:** The association of rheumatoid factor and uric acid

		Rheumatoid factor		Total	P value
		Positive	Negative		
Uric acid	Normal	8 (80%)	73 (78.5%)	81 (78.6%)	0.912
	Abnormal	2 (20%)	20 (21.5%)	22 (21.4%)	
<b>Total</b>		10	93	103	



**Figure 1:** Scatter shows the correlation of ESR mm/h and level of serum uric acid mg/dl.  
 P value 0.046  
 R= 0.197

## DISCUSSION

This study aimed to determine the frequency of Rheumatoid factor and elevated serum uric acid among apparently healthy Sudanese participants. The frequency of rheumatoid factor among apparently healthy participants in this study was (9.7%). This result is slightly lower than the results of (Manoussakis et al., 1987) and (Önen et al., 1998). (14% and 11.8%, respectively). This slight difference might be attributed to the small number of population in our study and different techniques used. Sixty percent of rheumatoid factor positive individuals were females. This confirms the fact that rheumatoid arthritis affects the females insignificantly more than males with a ratio of 3:1 (Hyd 1995; van Vollenhoven 2009).

Twenty one percent of the participants had an elevated serum uric acid; this finding is similar to the finding of (Mazzaa et al., 2017). An elevated serum uric acid in elderly has been associated with several fatal diseases such as coronary artery calcification (Kim et al., 2017), resistant hypertension (Mazzaa et al., 2017), cardiovascular disease and cancer related deaths (Di Stolfo et al., 2015), metabolic syndrome (Liu et al., 2014), and cognitive deterioration (Suzuki et al., 2016). Regular and tight management of elevated uric acid especially in the elderly may protect them from all these diseases.

Rheumatoid factor and uric acid are rarely coexisting in same individual (Jebakumar et al., 2013; Khosla et al., 2004; Gordon et al., 1985; Yoshifuji and Daio, 1999). In this study, insignificant coexisting occurrence of elevated serum uric acid and Rheumatoid factor has been noticed in only two participants (P value 0.912).

Significant correlation has been detected between elevated ESR and Gout (P value 0.046), this finding is similar to the finding of (Lee et al., 2017). Elevated serum uric acid may lead to inflammatory response in blood vessel which may be asymptomatic but leads to an increase in ESR levels. Insignificant elevation in the ESR level was noticed among rheumatoid factor positive individuals (P value 0.821).

## CONCLUSION

Rheumatoid factor and elevated uric acid level have been reported in asymptomatic elderly individuals with significant correlation between elevated serum uric acid and ESR level.

## RECOMMENDATION

It's highly recommended to screen periodically any elderly individuals (above 60 year) for serum uric acid and rheumatoid factor, which might help in early diagnosis and avoid any complication and comorbid diseases.

Conflict of interest:

The authors declare that there are NO conflict of interest with this manuscript.

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