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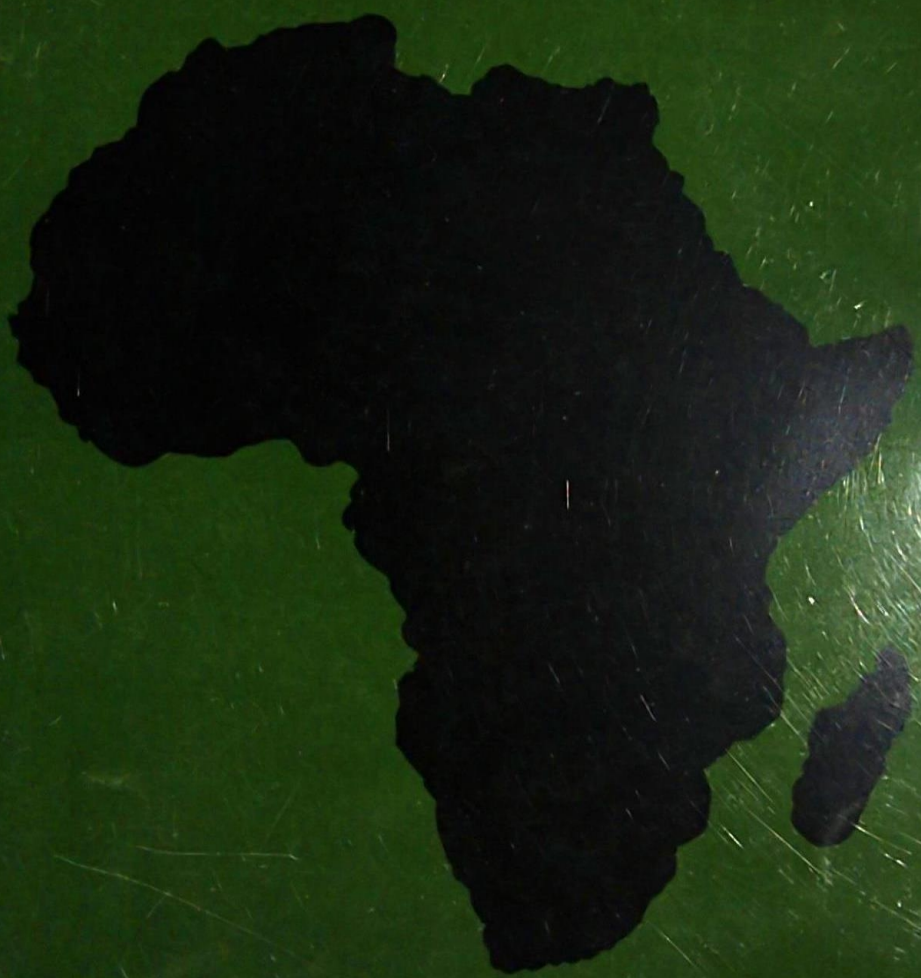

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Sir,

# Rheumatoid factor in sera of Nigerian school children with unrinary schistosomiasis

## Introduction

Rheumatoid factor (RF) has been demonstrated in the sera of healthy subjects [1], subjects with autoimmune diseases [2,3], hepatitis [4], malaria, leishmaniasis, trypanosomiasis [5], visceral larva migrans [6], tuberculosis [7], leprosy [8], syphilis [9] and bacterial periodontitis [10]. Literature concerning the presence of RF in USS subjects was not encountered. Moreso, in our previous study [11 increased levels of IgM in Nigerian USS subjects could not be linked with IgM-RF considering the rarity of autoimmune diseases in Africans and the young ages of USS subjects used for the study. The present study determined the prevalence of RF in the sera of Nigerian children with different severities of USS.

## Materials and methods

*Subjects*

The study was carried out on 104 Nigerian children with USS aged between 4 – 15 years (9.41 ± 4.25). The diagnosis and treatment of USS was carried out as previously described (12). Urinary schistosomiasis subjects were divided into lightly infected USS subjects (1-49 eggs/10ml urine) and heavily infected USS subjects (>50 eggs/10ml urine) based on the method described by W.H.O (13). Lightly- and heavily- infected USS subjects aged between 5-15 years (9.3 ± 4.9) and 4-15 years (8.9 ± 5.4) respectively. Fifty-two control subjects aged between 5-15 years (9.1 ±4.6) were chosen from the same class with USS subjects. They were apparently healthy children without urinary schistosomiasis. They were matched for age, sex and socioeconomic status. All infected USS subjects were treated with Praziquantel at a dose of 40mg/kg body weight. USS subjects were accepted as treated if no egg of *Schistosoma haematobium* was detected in the sediment of spun urine samples collected from them. Blood samples were collected from these treated subjects after 3 months of Praziquantel administration. Patients and controls with heavy infection of malaria, microfilariae or intestinal helminths were excluded from the study. Intestinal helminthes were diagnosed by detection of their characteristic eggs in early morning (8.00 – 10.00 hrs) faecal samples collected with white screw capped plastic ice cups. This was thoroughly mixed with normal saline strained through a mesh sieve, centrifuged at 3000rpm for 3 minutes, stained with Lugols iodine and viewed through 40x-400x magnification of a compound microscope.

A thin and thick blood films on a glass slides stained with Giemsa stain were used to investigate the status of *Plasmodium falciparum* and microfilaria. *Plasmodium* parasite number between 1 – 10 in every high power field was considered as heavy infection.

*Statistical methods*

Positivity of rheumatoid factor in the sera of USS subjects was compared with that of the controls using Chi-square method. Analysis of variance (ANOVA) was used to compare the mean (± s.d) ages of all the subjects.

*Rheumatoid Factors*

The presence of rheumatoid factor in serum was detected by human gamma globulin-coated latex particle agglutination test (QCA, Spain). Forty microliters (40ul) of undiluted serum was mixed thoroughly with latex reagent on a black tile. Latex agglutination within 3 minutes of mixing meant that the serum contained RF which was higher than 10 i.u/ml, therefore it was taken to be positive.

## Results

Table 1 shows that there was no significant difference in the mean ages of all subject groups (F=1.79, $P = 0.063$).

Rheumatoid factor was detectable in 61% of subjects with light USS, 72% of subjects with heavy USS, 10% of praziquantel treated USS subjects and 4% of control subjects (Table 2). Comparison of the positivity rates of RF in USS subjects and controls showed significant differences ($X^2 = 77.3$, $P < 0.005$). As shown in Table 2, there were significant differences between the positivity rates of heavily infected USS subjects and those of controls ($P < 0.05$), treated USS subjects ($P < 0.005$) and lightly infected USS subjects ($P < 0.005$).

**Table 1:** Comparison of ages (mean ± s.d) of USS subjects and the controls

| Subjects | Ages |
|---|---|
| Controls | 9.1 ± 4.6 |
| Light USS | 9.3 ± 4.9 |
| Heavy USS | 8.9 ± 5.4 |
| F-, p- values | 1.79, = 0.063, P < 0.05 is sig. |

**Table 2:** Positivity of rheumatoid factor (RF) in sera of apparently healthy Nigerians and Nigerians with USS.

| Subjects | Total number | RF negative | RF postive |
|---|---|---|---|
| Controls | 52 | 50* | 2 (4) |
| Treated USS | 69 | 60** | 7 (10) |
| Light USS | 55 | 21*** | 34 (61) |
| Heavy USS | 49 | 14 | 35 (72) |

*Percentages in parentheses*

*$X^2 = 77.3$, $P < 0.005$, $P < 0.05$ is significant.*

**Significantly different from heavy USS subjects ($X^2 = 3.82$, $P < 0.05$), $P < 0.05$ is significant.*

***Significantly different from heavy USS subjects($X^2 = 45.6$, $P < 0.005$), $P < 0.05$ is significant.*

****Significantly different from heavy USS subjects($X^2 = 54$, $P < 0.005$), $P < 0.05$ is significant.*

## Discussion

RF is considered to be an anti-IgG antibody (belonging to the 19S IgM class) directed against sites of the IgG antibody molecules exposed by combination with a specific antigen from infectious organism [14,15]. In this study, it was observed that RF occurred in significantly higher proportion of sera from heavily infected USS subjects compared with lightly

infected USS subjects, treated USS subjects or the controls. This shows that severity of infection appears to be a prerequisite for the appearance of RF. The likely explanation for this is that during heavy infection of *Schistosoma haematobium* (the causative agent of USS), continuous production of particulate schistosome antigens may overstimulate B-lymphocytes to synthesize and secrete excess or altered immunoglobulins. Total serum IgM was shown to be significantly increased in USS subjects and to have significant correlation with severity of USS [II]. This may support a conclusion that impaired T-lymphocyte switching results into overproduction of IgM [16]. This basic anormaly in T-cell function renders the immune system defective in producing IgG antibody but IgM from primary immunogenic stimulation is unaffected. Apart from this, host tissues that are destroyed by schistosome larva, adult worms and eggs may produce substances which combine with serum immunoglobulins. The complexes being formed may evoke the production of another antibodies particularly of IgM class.

The presence of RF in the sera of 2 (4%) out of 52 control children shows that RF is not found in only elderly and healthy Nigerians as earlier proposed by Oyeyinka [1,10]. Moreover,this is slightly higher than 2.5% prevalence of RF among healthy Nigerians with the age range of 6-25 years earlier found by Oyeyinka *et al* [1]. The difference in the two results may be caused by different sensitivities of the kits employed. The RF kit (QCA, Spain) used to carry out the present study could detect RF concentrations more that 10i.u/ml while Oyeyinka *et al* [1] employed RF kit (Rapi Tex, Behringwerke) that could not detect RF concentrations lower than 20 i.u/ml.

The non-detection of RF in sera of most (98%) USS subjects, 3 months after Praziquantel treatment may indicate the involvement of *S. haematobium* parasite in the production of rheumatoid factor, therefore the possibility that pathological changes of long term and untreated USS are due to autoantibody formation requires further investigation.

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