

Helminthiasis in Pregnancy in Enugu, Nigeria

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This prospective study was carried out between July and December 2000 at the University of Nigeria Teaching Hospital (UNTH), to determine the species and prevalence of intestinal helminthes in pregnant women attending antenatal clinics. A total of 161 stool samples were collected from the women. The samples were examined by the kato thick smear technique. For each stool sample, two kato slides were made and the average of the total number of eggs was taken. The prevalence of helminthic infection was 11.8% with only *Ascaris lumbricoides* (8.7%) and *Trichuris trichuria* (3.1%) being detected. The intensity of infection was generally high with a geometric mean intensity of 50.1 eggs per gm of faeces. About 11.8% of cases were multiple infections. There was no significant difference between the mean haemoglobin levels in both the infected pregnant women and the non-infected pregnant women. The poor socioeconomic status of the women coupled with poor environmental sanitation and lack of clean portable water supply contributed to the high prevalence of these parasites.

Key words — helminthiasis, pregnancy, socioeconomic status, environment sanitation

INTRODUCTION

Parasitic diseases particularly soil transmitted intestinal helminthic infections have been recognized as important public health problems in many developing countries.^{1–3} Intestinal parasitic diseases and the tropical zones have remained like Siamese twins.⁴ This is due to the inadequate attention given to sanitation and personal hygiene. Intestinal parasitic infections which are very common in Nigeria have become so important because of the high rates of morbidity and sometimes mortality among patients in Nigerian towns and villages.^{4–6} An earlier survey on the prevalence of helminthic infection in the general populace in Enugu in 2002⁷ established a prevalence rate of 27.9%.

The current study focused on pregnant women because of the decreased immunity in this group and the possible effects on foetal well being. The study was carried out in the University of Nigeria Teaching Hospital (UNTH), Enugu to identify the prevalence of parasites which can further contribute to the decreased immunity in this vulnerable group and

prefer solutions which will help prevent infection. The UNTH is the only tertiary health facility in the state. Enugu is situated in the South Eastern part of the country with a population of 1.7 million. It has a maximum average temperature of 29–34.5°C and minimum of between 20–32°C and annual rainfall of 1500 mm.

Water supply is inadequate with the majority of the populace relying on shallow wells. Ninety-six percent of the drainage system consists of open gutters, the majority of which are usually blocked with sand and refuse. The waste disposal system is also inadequate. Waste is left in open containers and litters the surroundings.

MATERIALS AND METHODS

The study was a prospective investigation in which 161 stool samples were collected from pregnant women attending antenatal clinics, between July and December 2000. The samples were collected in wide-mouthed bottles which were promptly sent to the UNTH laboratory and examined, using the kato Thick Smear Technique.⁸ Smears were examined immediately for hookworm eggs and after 48 hr for eggs of other helminthes. For each stool sample, two kato slides were prepared and the average of the to-

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Table 1. Prevalence of Intestinal Helminthes in Pregnant Women in Enugu

No of samples examined	Number positive for <i>Ascaris lumbricoides</i>	Number positive for <i>Trichuris trichuria</i>	Multiple infection (Ascaris and Trichuris)
161	14 (8.7)	5 (3.1)	19 (11.8)

Figures in parenthesis indicate percentage.

tal number of eggs counted on the two slides taken.

Statistical analysis was done by Chi-square test and $p < 0.05$ was regarded as significant.

RESULTS AND DISCUSSION

Out of the 161 stool samples examined, 38 (23.6%) were positive for intestinal helminths (Table 1). *Ascaris lumbricoides* was the most prevalent (8.7%) while trichurie trichuria accounted for 5 (3.1%). No other helminth was detected. Both *Ascaris lumbricoides* and *Trichuris trichuria* occurred together in 19 (11.8%) of stool samples.

The results of this study confirm a high prevalence and heavy intensity of Ascariasis and trichuriasis in pregnant women in Enugu. A very high prevalence of these helminths have also been reported in other studies,³⁻⁵ although their studies unlike ours were not confined to pregnant women. Majority of these women with helminthic infections were from the low socioeconomic group, with concomitant low hygiene practices and lack of potable water supply. Among the 161 women who were examined for helminths, 80 belonged to the low income group, with 30 positive for helminths, while 51 belonging to the middle income group, with 8 positive for helminths and 30 belonging to the high income group, with none being positive. All the women in the low income group lived in places with poor environmental sanitation, while only 4 of the 8 women with helminthiasis in the middle income group lived in places with fairly improved environmental sanitation with running water and private toilets. The advice normally given to pregnant women to eat plenty of green vegetables must have contributed to the high prevalence of these helminths. These vegetables are normally cultivated in open farms where people defecate and where untreated refuse are also dumped. These coupled with the absence of clean portable water to wash the vegetables properly and the ignorance of the majority of the women on the means and methods of transmission of these parasites contributed to the high

prevalence. The geometric mean intensity of infection for both helminths was high, 50.1 eggs per gram of faeces, with the prevalence of Ascariasis (8.7%) being higher than that of trichuriasis (3.1%). Previous studies⁴⁻⁷ also confirmed ascariasis as being more prevalent than that of trichuriasis. It is well known that soil transmitted helminthes play important roles as contributory factors in the aetiology of childhood malnutrition, as heavy chronic infections may aggravate or precipitate malnutrition especially among already undernourished children from socio-economically disadvantage communities.

This may not necessarily be the case in adults as no case of malnutrition was recorded in this study, but the morbidity caused by the heavy intensity of infection may adversely affect the foetal well being.

The absence of hookworm ova and strongyloides is most likely due to the fact that most of these women were civil servants and traders and were thus not exposed to situations like farming, since both helminths are mostly acquired by penetration of the lower limbs.

Prevalence of Helminths Per Parity of the Pregnant Women

The pregnant women were classified into three groups viz: nullipare, primipare and multipare based on parity. The number of positive cases varied slightly with parity, but this was not statistically significant ($p < 0.01$). There was no significant difference in prevalence of helminthes per parity between pregnant women and non-pregnant women ($p < 0.01$).

The mean haemoglobin concentration was low 8.6 gm% without any significant difference between the mean haemoglobin concentrations of the infected pregnant women and the non-infected pregnant women. Both *Ascaris* and *Trichuris* are not known to significantly affect the haemoglobin concentration in adults and this accounts for the mean haemoglobin concentration not being significantly different between the infected pregnant women and the non-infected pregnant women. Also malaria parasites may have contributed to low haemoglobin lev-

Table 2. Prevalence of Helminthiasis Per Age Group in 161 Pregnant Women

Age group (years)	Number examined	Number/percentage positive
16–20	20	6 (30)
21–30	104	23 (22.1)
31–40	33	8 (24.2)
41–50	4	1 (25)

Figures in parenthesis indicate percentages. $p < 0.01$.

els but this was not part of the study.

Prevalence of Helminths Per the Age of Pregnant Women

The pregnant women were classified into 4 groups based on their age group (Table 2). The number of pregnant women with helminthiasis varied among the different age groups with the highest percentage among the 16–20 age groups (30%), but this was not statistically significant ($p > 0.05$).

This study confirms that Ascariasis and trichuriasis are major health problems in pregnant women in Enugu and this has grave implications, since any possible effects on foetal well being have not been properly investigated.

It is an indication of the low socioeconomic status of the women and poor environmental sanitation of the town, which includes poor methods of refuse disposal, resulting in refuse being collected in open containers which are left for the most part to overflow and litter the surroundings.⁷⁾

Portable water supplies are lacking in most parts of the town, with the majority of this populace relying on shallow wells. Ninety-six percent of the drainage system consists of open gutters, the majority of which are usually blocked with sand and refuse. The waste disposal system is also inadequate. Waste is left in open containers and litters the surroundings and many families share toilet systems.

Based on occupation and educational level of the pregnant women and their spouses, the pregnant women were divided into three groups viz: low, middle and high socio-economic status. These factors, coupled with the absence of public toilets, contributed to the high prevalence of these helminths.

Improved environmental sanitation, provision of portable water supply and sanitary sewage disposal facilities are important in preventing infestation by

these helminthes. Regular screening of all pregnant women for intestinal helminths at the first pre-natal visit, coupled with health education is also important.

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