



Prevalence of Intestinal Parasites amongst selected age groups within Okada, South –South Nigeria.

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Abstract

This study was conducted to determine the prevalence of intestinal parasites from volunteered individuals in the study site. A total of 300 stool samples, comprising 150 females and 150 males were collected randomly from the study population in Ovia North-East Local Government Area in Edo State, aged between 1 and 60 years. The stool samples were aseptically collected and examined using both direct smear method and formol ether sedimentation techniques to determine the individual parasite load of the sampled population. The age group of 16-20 had the highest number of participants 102(34%) while the age group of 6-10, 51-55 and 56-60 had the least number of participants of 3(1%) respectively. Out of the 300 stool samples examined 87, (29%) were positive with intestinal parasites while 213(71%) were negative, not having any intestinal parasitic infection. However the age group of 11-15(N=10) and 31-35(N=10) had the highest prevalence rate of 11.5%, while the lowest prevalence (1%) was found in individuals of ages 41-60 years. There was no intestinal parasites found among the individuals below 11 years of age. Of the 150 male candidates examined, 57 (65.5%) were infected with intestinal parasites. On the other hand, their female counterparts had a total prevalence of 34.5%. A total number of six parasitic species were isolated from the fecal specimens. These were *Ascaris lumbricoides*, *Trichuris trichiura*, *Strongyloides stercoralis*, *Entamoeba coli*, Hookworms and *Entamoeba histolytica*. *Ascaris lumbricoides* had the highest prevalence rate (12%), while *Trichuris trichiura* and *Strongyloides stercoralis* had the least prevalence rate (1%) respectively. The intestinal parasite infection and age were negatively correlated and there was a significant difference between the male and female infection rates ($p < 0.05$).

Article History

Received 03 March 2020
Accepted 14 June 2020

Keyword

Prevalence,
Intestinal parasites,
Formol ether,
Helminthes,
Protozoans.

Introduction

Intestinal parasites are parasites that populate the gastro-intestinal tract, typically protozoa and helminthes which are the two major types of intestinal parasites (Udensi, *et al.*, 2015). There are over 65,000 species of protozoa found in nature existing in various forms of

symbiotic relationships with man and his domestic animal who becomes victims of the parasites (Udensi, *et al.*, 2015).

Parasitic infections of the gastro-intestinal tract of man are amongst the most common infections globally and it is estimated that about 3.5 billion people are affected with children being more susceptible to the infection due to their vulnerability to nutritional deficiencies (Udensi, *et al.*, 2015; Nxasana, *et al.*, 2013,).

The helminthes *T. trichiura*, *Ascaris lumbricoides* and the hookworm as well as the protozoa *Entamoeba histolytica* have been observed to cause infections of varying degrees in 48 million people worldwide (Udensi, *et al.*, 2015; Ekpo, *et al.*, 2008; Elliott, *et al.*, 2007; Alaofe, *et al.*, 2008).

Intestinal parasitic infections are a serious public health problem because they can cause iron deficiency, anaemia, growth retardation in growing adults and children as well as causing varying physical and mental health conditions (Nxasana *et al.*, 2013; Esiet, *et al.*, 2017).

High prevalence of infections associated with intestinal parasites can be attributed to poverty, poor environmental hygiene and inadequacies in medical services (Nxasana *et al.*, 2013; Odo, *et al.*, 2016; Akinbo, *et al.*, 2011; Kwitshana, *et al.*, 2008; Ostan, *et al.*, 2007; Okyay, *et al.*, 2004).

In Nigeria, a considerable amount of human and animal wastes are discharged into the soil daily leading to seepage with pathogenic organisms which includes cysts, eggs and larvae of these parasites (Udensi, *et al.*, 2015).

Materials and Methods

Sterile Universal Specimen bottles (with screw caps) without preservatives were used to collect stool samples from the participants dung. This study's unique identification numbers were also assigned to the sample bottles matching the biodata of the individual participant provided in a re-filled questionnaire.

All participants were asked to transfer an aliquot of their early morning stool samples into the sterile labelled sample bottles. The samples were then received and transported in cooler bags to the Microbiology laboratory of Igbinedion University, Okada within two hours of sample collection. Properly collected stool samples were then processed using formalin ethyl-acetate concentration technique as described by Nyundo *et al.*, (2017). After concentration, a drop from the sediment was placed onto a sterile, grease-free microscope slide and covered with cover slip. The entire cover slip was examined with 10x Objective and 40x Objective respectively to observe the presence and morphology of eggs, cysts or larvae of intestinal parasites. The results obtained from each sample were recorded in special record sheets.

Results

The total number of individuals examined was 300. These were grouped into different age categories with an interval of 5 years, for each class boundary. The highest number of individuals was found in the class boundary of 16- 20 years, with a total number of 102 individuals. The least number of participants (3 each) was obtained from the class boundaries of 6-10, 51-55 and 56-60 years respectively. The variation in the number of participants in different age groups was likened to the availability of the individuals at the time of study.

The sex related distribution of the participants is shown in figure 2. There were equal number of male and female participants showing a prevalence of 50% each.

Out of the 300 individuals examined in the various age groups, 87 had intestinal parasites in their stools. Prevalence of the infection is 29% while the uninfected had a prevalence of 71%.

The age prevalence of the infection is shown in figure 4. The highest prevalence was obtained from the 16-20 years and 31 – 35 years age categories. This was followed by the 11-15 years category with a total prevalence of 9%.

Out of the 87 infected individuals, the males were 57 representing a prevalence of 65.5% while the females were comparatively lower both in the number of individuals (N=30) and the prevalence rate(34.5%).

The total number of intestinal parasites obtained from the fecal specimens was 87, out of which, the parasite species were six in number. The prevalence of the individual parasite group showed that *A. lumbricoides* had the highest prevalence rate compared with the other parasitic species. The lowest occurring parasites were *T. trichiura* and *S. stercoralis*, fig. 5

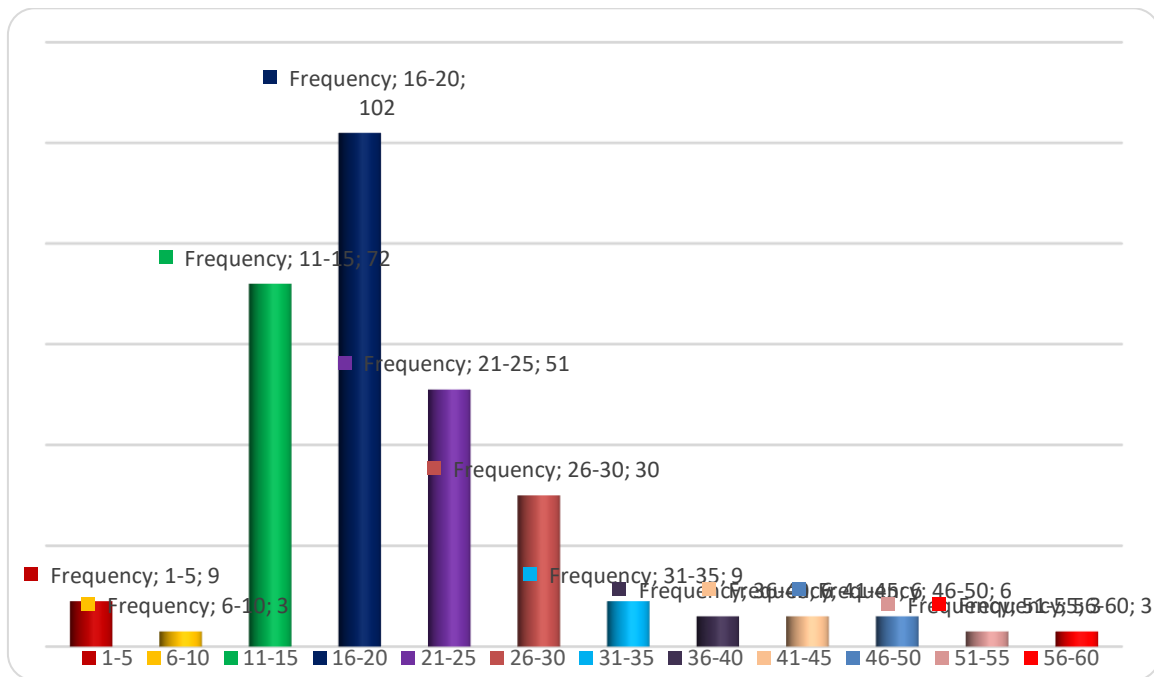


Figure 1. Age Distribution of the Subjects

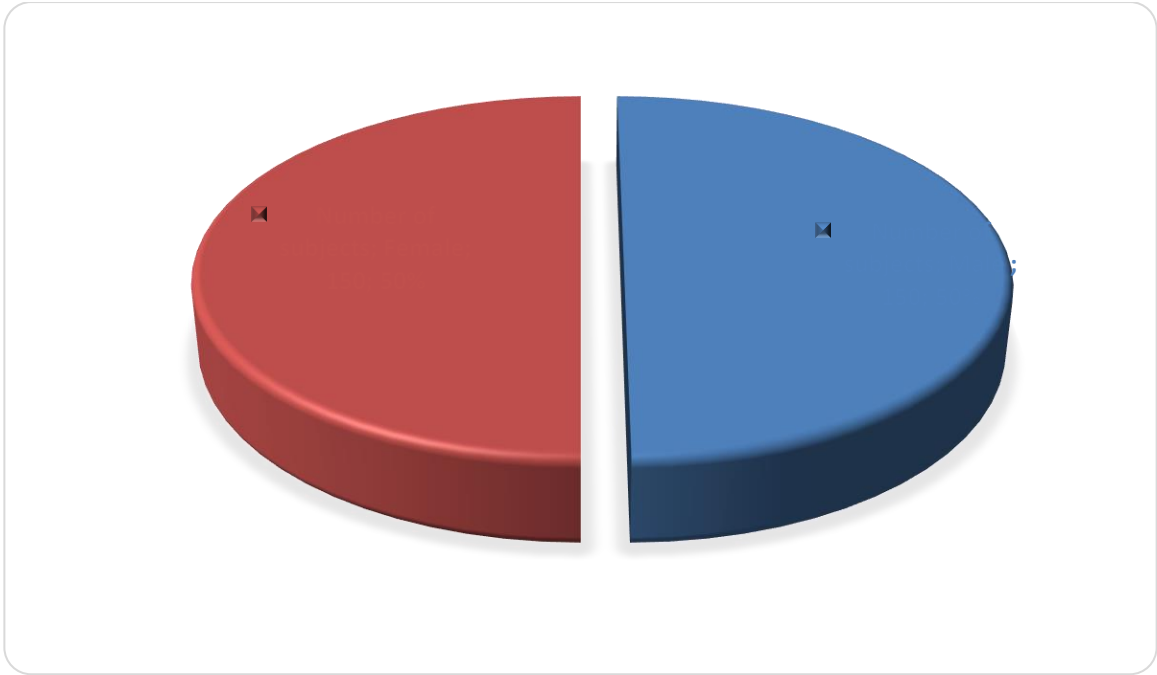


Figure 2. Sex distribution of subjects

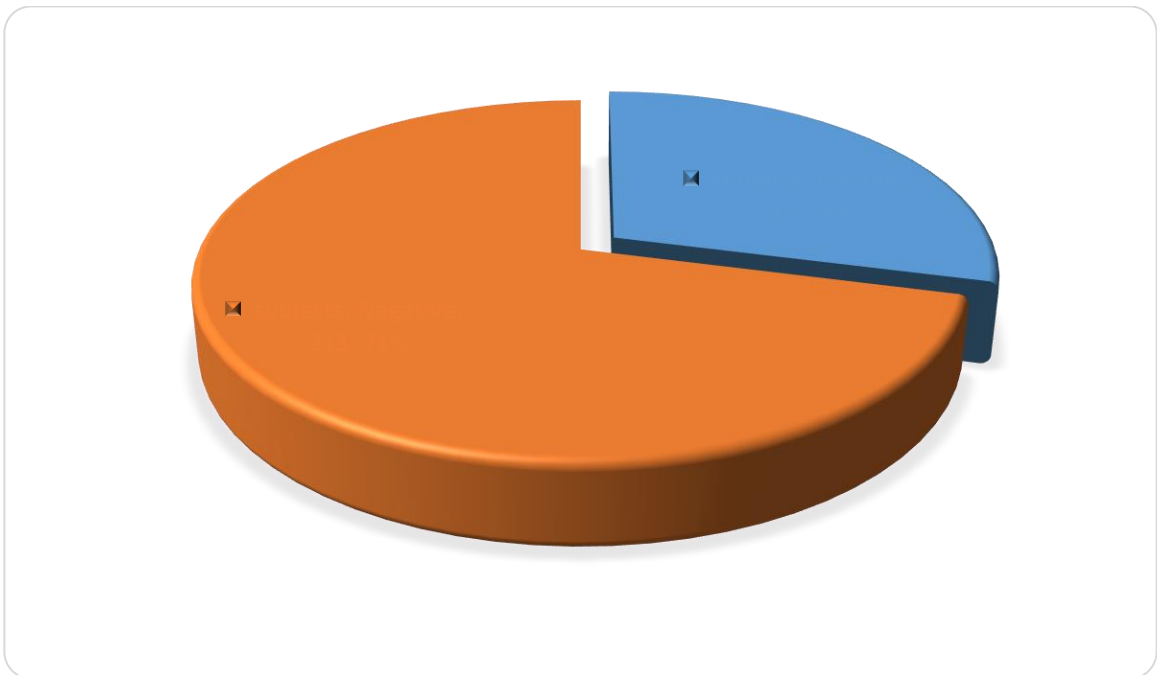


Figure 3. Percentage of Subjects with Intestinal Parasites

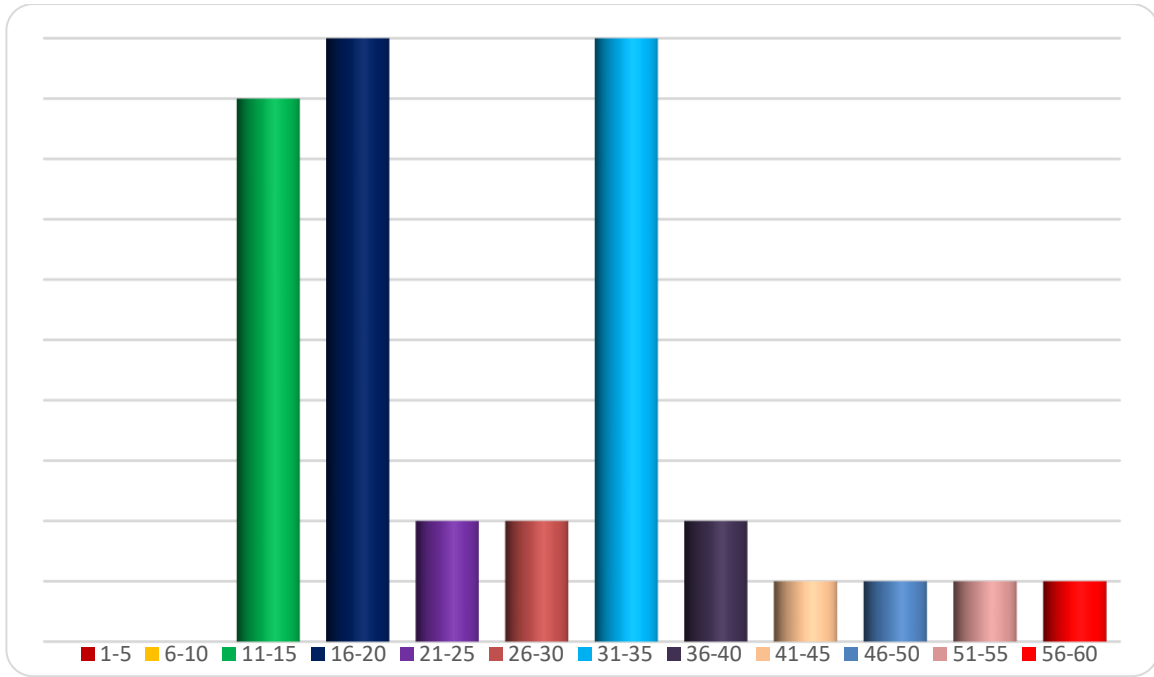


Figure 4. Age related prevalence of Intestinal parasites

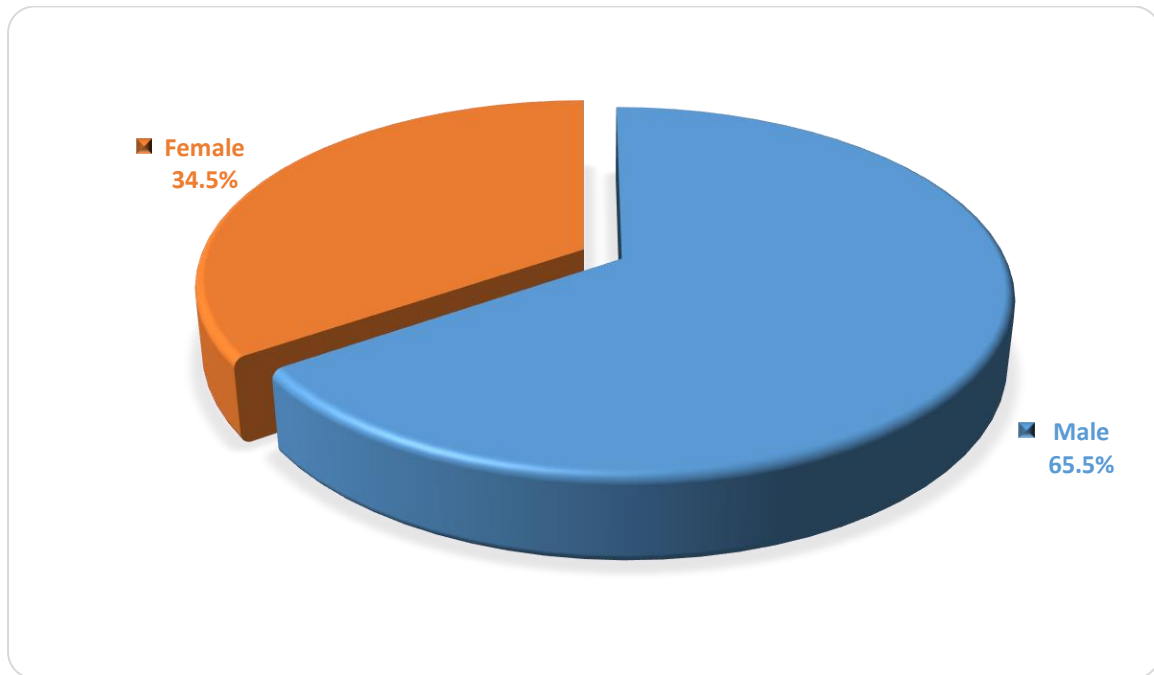


Figure 5. Gender prevalence of positive samples.

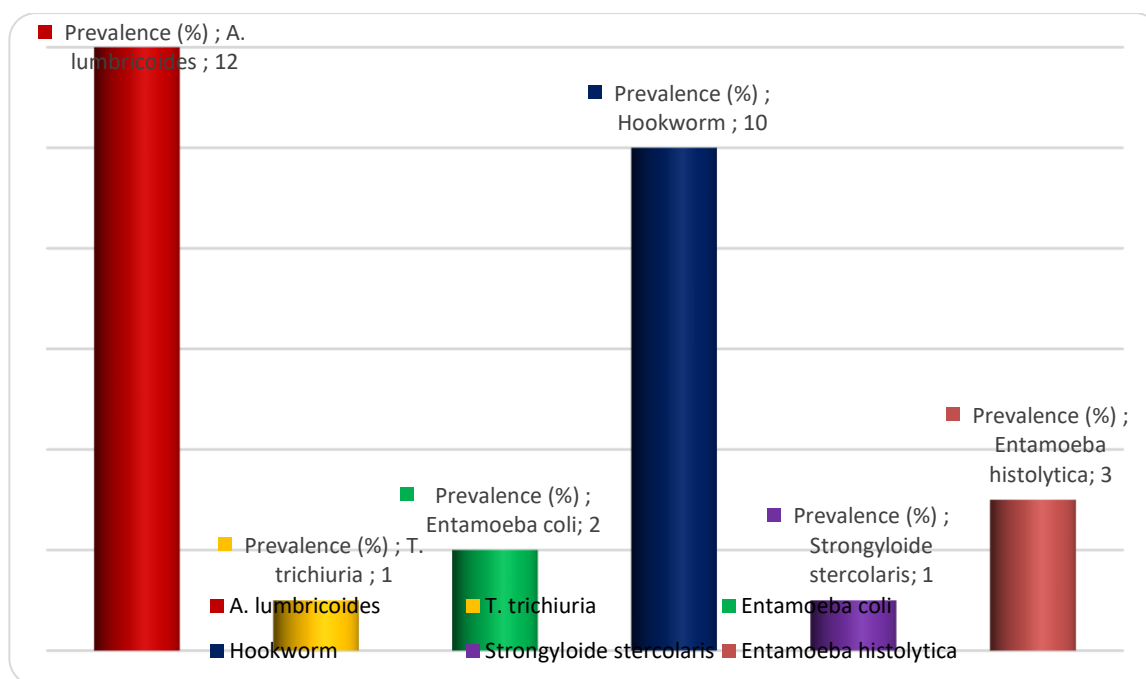


Figure 6. Prevalence of parasites

Discussion

In this study, the prevalence of 29% gastro-intestinal parasites was observed amongst in-patients of Igbinedion University Teaching Hospital, Okada, Edo State. This result is similar to the report by Ede, *et al.*, on the prevalence of intestinal parasites among primary school children in Wukari L.G.A of Taraba State, Nigeria. However, in some rural communities in North – Eastern Nigeria, a higher prevalence of 80.9% was reported amongst Almajiri school children (Damen, *et al.*, 2013). Similar results of (58.5%) and (51.0%) were also observed in rural communities in Benue State, Nigeria.

Similar prevalence rate of intestinal parasites of 29.0% was also recorded among Pre-school children in some urban communities in Benue State, Nigeria. The low percentage rate of infection recorded in these studies may be attributed to public enlightenment and sensitization on good environmental and personal hygiene and accessibility to health care facilities.

The presence of six (6) species of intestinal parasites in this study area suggests that the prevailing environmental conditions support a wide range of intestinal parasites. Among the helminthes observed, the most prevalent was *Ascaris lumbricoides* with 12% occurrence, followed by Hookworm with 10%. For the protozoan parasites, *E. histolytica* had the highest prevalence rate of (3%) while *Strongyloides stercoralis* and *Trichostrongylus* spp both had the least prevalence of 1% each.

These patterns observed are in line with the findings of some researchers in parts of Nigeria (Udensi, *et al.*, 2015; Akinbo, *et al.*, 2011 and Kpurkpur *et al.*, 2016). According to Udensi, *et al.*, 2015, the patterns of intestinal parasites distribution among school age children may be attributed to factors such as poor toilet facilities, children playing in filthy environment, as well as poor supply of portable drinking water.

The age groups of 16-20 and 31-35 years had the highest prevalence of (10%) which is not in accordance with reports by Akinbo *et al.*, 2011, who recorded higher prevalence of intestinal parasites amongst patients aged 51 years and above. The lower prevalence rate of intestinal parasitic infection among participants aged 41 years and above, as well as children

aged 1-6 and 6-10 years respectively compared with the participants aged 16-20 and 31 -35 could indicate behavioral patterns observed among families in rural and sub urban settings where the younger ones stay at home and are well catered for, while the older children run most of the errands which includes open water related chores such as fishing, washing and processing of some food products in streams and rivers. The middle aged class is also mostly engaged in agricultural activities and fish farming which constantly expose them to parasites deposited in the soils, water bodies and other reservoirs in their immediate environment.

In this study, it was discovered that more males (65%) than females (35%) were infected. This could relate to the fact that males are more outgoing and could be exposed to environmental contaminants than the females who mostly stay at home to attend to most of the domestic chores.

The correlation between age and the infection rate of intestinal parasites in the present study is negative. This observation is in line with the pattern of intestinal parasitic infection in most rural study areas. This agrees with the work of Udensi *et al.*, (2015) who observed similar results in his study.

Conclusions

From the present study, it was ascertained that the rate of occurrence of intestinal parasitic infection was low probably due to the peri- urban nature of Okada community. The six parasitic species isolated from the fecal specimens were randomly distributed among the various age groups except for the 1-10 age brackets. The prevalence was high among the young adults of ages 11-15, 16-20 and the adult age group of 31-35. The gender prevalence was highest among the males. There was a negative correlation between age and the infection rate. The pattern of infection with intestinal parasites in this study shows that the more active age groups have more parasite loads compared to the others. It is therefore, pertinent to consider this infection pattern while initiating control programs of parasitic infections in rural communities.

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