



PROSPECTIVE ANALYSIS OF THE RELATIONSHIP BETWEEN INTESTINAL PARASITIC INFECTIONS AND THE OCCURRENCE OF HEMORRHOIDAL DISEASE IN A YOUNG IVOIRIANS' POPULATION

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ABSTRACT

This epidemiological study is a contribution to the research of the etiopathogenic factors of hemorrhoids. Its main objective was to investigate a possible relationship between intestinal parasitic infections and the occurrence of hemorrhoidal disease in young Ivorians population. The investigation was designed as a descriptive and analytical cross-sectional survey in which 1228 students have been enrolled at the University Félix Houphouët-Boigny (UFHB) in Côte d'Ivoire. The respondents had an average age of 22.5 years and were composed of individuals from all the five ethnic groups of the country. The results showed an important prevalence of hemorrhoids and intestinal parasitosis in the population and revealed, for the first time in Côte d'Ivoire, that persons with intestinal parasitic infections, namely, protozoa, were exposed to hemorrhoids.

KEYWORDS: Hemorrhoidal diseases, Intestinal parasitic infection, Young Ivoirians.

INTRODUCTION

Hemorrhoidal disease results in painful progressive dilation or rupture of the hemorrhoids venous plexus. It is one of the most common diseases of the terminal intestine. It is the primary reason for proctological surgery in Côte d'Ivoire, and has become a public health concern in the country (N'Dri *and al.*, 1994). Mechanical triggering or inflammatory factors are usually distinguished as contributing factors. Apart from heredity, as contributing factors certain conditions such as sedentary lifestyle, transit disorders, pregnancy, and eating habits are incriminated (Sielezneff *et al.*, 1998). Concerning eating habits, empirical notions suggest that they play a role in the physiopathology or the triggering of hemorrhoidal attacks. According to Amoikon *et al.* (2016), the occurrence of hemorrhoids among Ivorians is linked to a high consumption of red meat (more than three times a week). In order to contribute to the search for causal factors, the present study aimed at investigating the involvement of intestinal parasitic

infection in the occurrence of hemorrhoidal disease. Thus, an epidemiological survey was conducted to investigate the prevalence of hemorrhoidal disease and intestinal parasitic infection in a population of young Ivoirians, and to assess the relationship between these two health concerns.

MATERIAL AND METHODS

This epidemiological survey is a cross-sectional study for descriptive and analytical purpose. It took place at the University Félix Houphouët-Boigny (UFHB) of Abidjan, from October 15, 2016 to February 17, 2017. It was targeted at a mixed population of volunteer students composed of boys and girls attending the programs of the second year of study in Biosciences.

A sample of respondents declaring to experience hemorrhoids or not (suspected of being ill or not) has been submitted to proctologic examination using a mechanical anoscope (A. Legrand, France) in order to

confirm the diagnosis of hemorrhoids among them. Then, stool samples were collected in accordance with the parasitological rules and examined under an optical microscope to search for intestinal parasites (worms and their eggs, protozoa).

Data analysis was done with SPSS.20 software. For quantitative variables, the mean and extreme values were determined. For qualitative variables, the distribution of the proportions was chosen. The comparison of proportions was made using the Chi-square or Yates-corrected Chi-square test, or Fisher's exact test when the conditions for the Khi- test were not matching. The threshold of significance was set at a value of $P \leq 0.05$ ($\alpha \leq 0.05$).

Informed consent was obtained from all students involved in the study. The results of this study were to be published, but respondents' names or identities were not revealed. Records remained confidential and the results of tests were codified to prevent association with participants' names. Data entered into computerized files were accessible only by authorized personnel directly involved in the study. Respondents' specific information could be provided to medical personnel only with the respondents' permission.

RESULTS

1- Demographic factors

The study focused on a young population with an average age of 22.5 years (Figure 1). The boys were the dominant group with a sex ratio of 2.84 (Figure 2). The respondents belonged to five ethnic groups, namely the Koua Akan, Krou, northern Mandé, Gour, southern Mandé. To these groups, were associated foreigners coming mainly from neighboring countries of Côte d'Ivoire. They represented 2% of the respondents. The predominant ethnic group was the Koua Akan's representing 51% of the respondents (Figure 3).

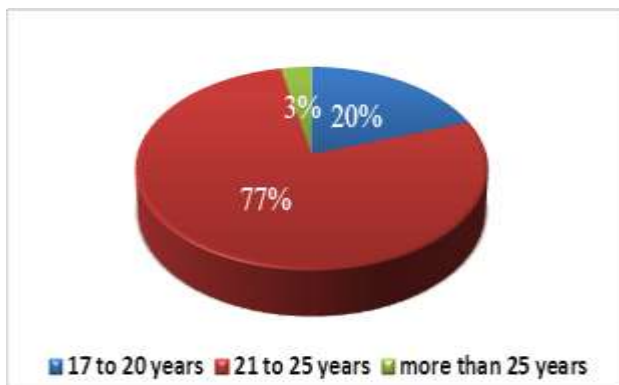


Figure 1: Distribution of respondents by age Total population = 1228 students.

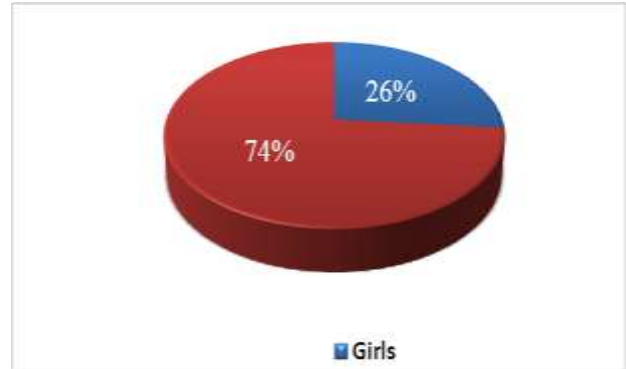


Figure 2: Distribution of respondents by sex Total population= 1228 students.

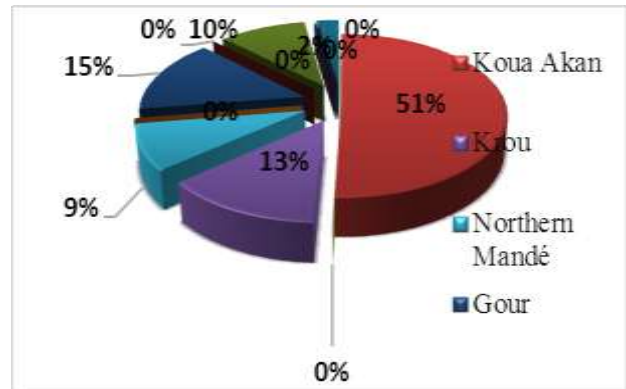


Figure 3: Distribution of respondents by ethnic group Total population = 1228 students.

2- Prevalence of hemorrhoidal disease and intestinal parasitic infections in the study population

The health assessment in the study population (1228 students) highlighted a prevalence of 39.7% of individuals with frequent hemorrhoid attacks (Figure 4). At parasitological level, 108 individuals, including 53 hemorrhoids and 55 non-hemorrhoids, accepted to give their stool for examination. Of these volunteers, 18% had pathogenic parasites in the faeces compared to 82% with no intestinal parasite (Figure 5 and 6). The parasites found were helminths and protozoa. All the helminths were from the group of roundworm while protozoa were represented by *Giardia intestinalis*, *Entamoeba histolytica*, and *Chilomastix mesnili* (Figure 6).

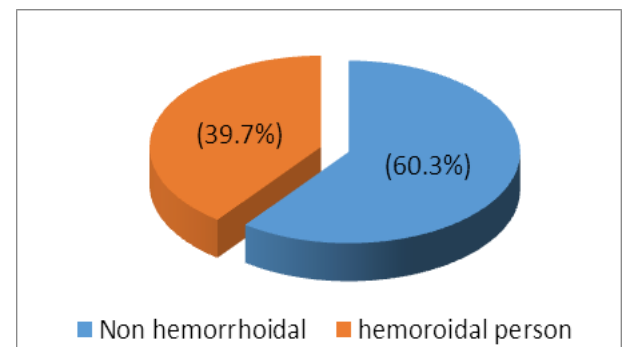


Figure 4: Prevalence of hemorrhoidal disease among students.

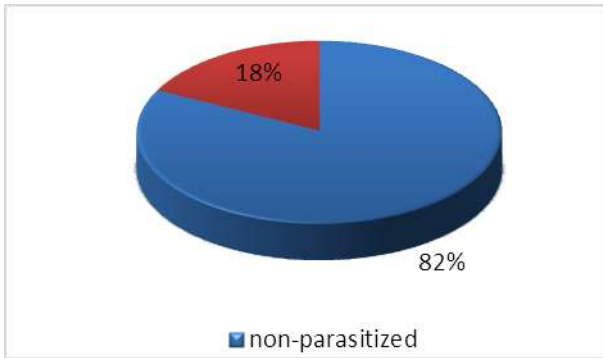


Figure 5: Distribution of respondents according to the presence of pathogenic parasites in the faeces (N = 108).

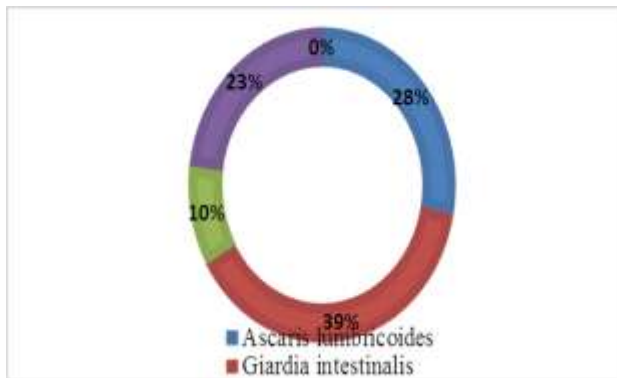


Figure 6: Distribution of the different pathogenic parasites identified in the faeces (N = 19; ~ 18% of the 108 volunteers).

3- Relationship between hemorrhoidal disease and parasitic infection

As stated in figure 7, 5.46% of non-hemorrhoidal students had pathogenic parasites. The parasites identified in their stools were only helminths (Ascaris earthworm). For those experiencing hemorrhoids, 30.19% were infected with pathogenic parasites, the majority of which being protozoa. An overall analysis of the relationship between disease and parasitic infection, according to Fischer's exact test, showed a close relationship between the two variables (P = 0.006). A closer view by type of parasite (Figure 8) demonstrated a strong relationship between protozoa and the disease (P = 0.01), whereas the helminthes do not show as significant relationship with the disease (P = 0, 06).

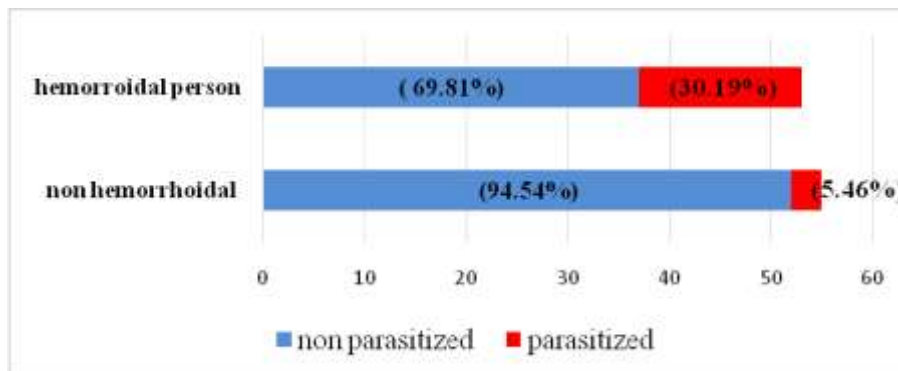


Figure 7: Relationship between parasitic infection and the occurrence of hemorrhoids (N = 108, P = 0.006).

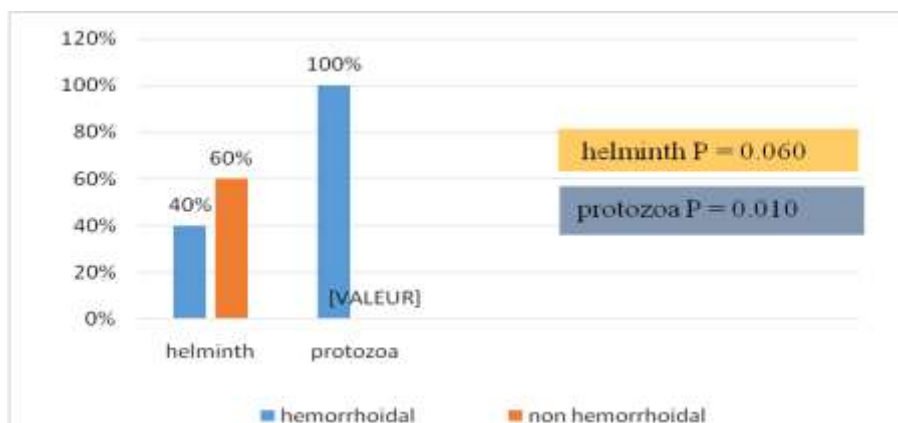


Figure 8: Relationship between the type of parasite and the occurrence of hemorrhoids (N= 108).

DISCUSSION

In this study, there was a male predominance with a sex ratio of 2.84. The reason is that at the national level, the schooling rate of boys is higher than that of girls (National Institute of Statistics, Côte d'Ivoire, 2015).

The predominant ethnic group was the Koua Akan's (51%). This could be explained by the geographical situation of the University Félix Houphouët-Boigny of Abidjan which is more accessible to this ethnic group due to its location in the southern part of the country. These results are comparable to those of Amoikon *et al.*, (2016).

The study evaluated the health status of students namely the prevalence of hemorrhoidal disease and intestinal parasitic infections. This investigation revealed a prevalence of 39.7% of hemorrhoids and 18% of intestinal parasitic infections among the respondents. The prevalence of hemorrhoids is very close to those of Amoikon *et al.* (2016) in Côte d'Ivoire (40.37%), Dembélé (2009) in Mali (40.15%) and Klotz (1988) in Gabon (37.28%). Moreover, the prevalence of intestinal parasitic infections corroborates that of Coulibaly *et al.* (2018) in Côte d'Ivoire.

The involvement of this intestinal parasitic infections in hemorrhoidal pathology has been investigated. According to Fisher's exact test, there is a strong relationship between the presence of parasites in the intestine and the occurrence of hemorrhoids ($P = 0.006$). A finer analysis by type of parasite showed that only the protozoa were at the basis of this relationship ($P = 0.010$). These results are supported by the clinical manifestations and the action of these germs on the digestive tract. For example, giardiasis, which had the highest prevalence in this research, is expressed by an abdominal pain syndrome, an evidence of a parasitic duodenitis, and an intestinal malabsorption syndrome, characterized by chronic diarrhea with fatty faeces (Aubry, 2014). This symptomatology could explain our findings because chronic diarrhea has been reported to be strongly associated with the occurrence of hemorrhoids in Côte d'Ivoire (Kouamé, 2008).

CONCLUSION

Hemorrhoidal disease is the primary reason for proctological surgery in Côte d'Ivoire, and has become a real public health concern. This study was initiated in order to contribute to the search for its ethiopathogenic factors. As result, it showed a high prevalence of hemorrhoids in a population of students with or without parasites. The data analysis, revealed for the first time in Côte d'Ivoire that individuals with intestinal parasitic infections, especially protozoa, were exposed to the occurrence of hemorrhoids.

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