GSC Biological and Pharmaceutical Sciences

eISSN: 2581-3250 CODEN (USA): GBPSC2

Cross Ref DOI: 10.30574/gscbps

Journal homepage: https://gsconlinepress.com/journals/gscbps/

(RESEARCH ARTICLE)

Check for updates

Comparative study of the frequency of non-pathogenic intestinal protozoa in the pediatric and adult populations at the Mohammed VI University Hospital in Oujda/Morocco

Ismail Faiz [1, 2, *] and Aziza Hami [1, 2]

[1] *Laboratory of Parasitology/Mycology, Faculty of Medicine and Pharmacy, Hay AL Hikma BP Box 4867, 60049, Oujda, Morocco.*

[2] *Laboratory of Parasitology/Mycology, Mohammed VI University Hospital Center, 60049, Oujda, Morocco.*

GSC Biological and Pharmaceutical Sciences, 2026, 34(02), 075–079

Publication history: Received on 31 December 2025; revised on 07 February 2026; accepted on 09 February 2026

Article DOI: https://doi.org/10.30574/gscbps.2026.34.2.0050

Abstract

Blastocystis hominis, *Endolimax nanus*, *Pseudolimax butschlii*, *Entamoeba coli*, and *Chilomastix mesnili* are non-pathogenic intestinal parasites belonging to different genera of protozoa. They are common in the general population with a cosmopolitan distribution, and they are often the witness of fecal-oral contamination and poor food hygiene. The objective of our study is to verify whether or not there is a significant difference in the frequency of carriage of these parasites depending on age (child, adult). The retrospective study included all stool samples received in the Parasitology / Mycology Laboratory of the Mohammed VI University Hospital of Oujda for 3 years (from 08/07/2019 to 07/29/2022). In children, we performed 456 parasitological stool examinations, 33% of which were positive (n = 150), while in adults, 2325 parasitological stool examinations were conducted with 39% positive results (n = 900). We compared the frequencies observed in children and adults for each parasite using a parametric statistical test using XLSTAT™ statistical software. According to these results, we note that there is no significant difference in the frequency of carriage of these intestinal protozoa between children and adults and that there is no preferred predisposition to contracting these parasites depending on age, except for *Chilomastix mesnili,* which is more common in adults ($p < 0.0001$). The frequency of this parasitic carriage is practically identical in the pediatric and adult populations, hence the interest in fighting against these parasites by treating patients, especially symptomatic ones, properly managing fecal peril, and reinforcing individual and collective hygiene.

Keywords: Non-Pathogenic Intestinal Protozoa; Fecal-Oral Contamination; Carriage; Parasitological Stool Examination.

1. Introduction

Blastocystis hominis, *Endolimax nanus*, *Pseudolimax butschlii*, *Entamoeba coli*, and *Chilomastix mesnili* are non-pathogenic intestinal parasites belonging to different genera of protozoa. They are common in the general population with a cosmopolitan distribution, and they are often the witness of fecal-oral contamination and poor food hygiene (1,2). Carriage is often ignored by patients, and the detection of these parasites is made during a routine parasitological stool examination or following digestive disorders (diarrhea, flatulence, etc.), which are sometimes the reflection of the exceptional expression of the pathogenic power of these parasites in certain patients with predisposing factors (3,4). The objective of our study is to verify whether or not there is a significant difference in the frequency of carriage of these parasites according to age (child, adult).

* Corresponding author: Ismail Faiz.

2. Material and methods

A retrospective study including all stool samples received in the Parasitology/Mycology Laboratory of the Mohammed VI University Hospital in Oujda for 3 years (from 08/07/2019 to 07/29/2022). The samples were then classified according to the age of the patients into two cohorts: a cohort of children from 0 to 17 years old, and a cohort of adults from 18 to 98 years old. For each sample, a parasitological stool examination (PSE) in the fresh state and after staining with Lugol1% was carried out. Each patient produced 3 stool samples spaced 2 to 3 days apart to avoid silent periods of emission.

3. Results

3.1. Child cohort (0 to 17 years)

In this population, we performed 456 parasitological stool examinations, 33% of which were positive (n = 150). *Blastocystis hominis* was the most common parasite with a frequency of 68% of all non-pathogenic parasites isolated (n = 102) and a prevalence of 22% in the entire pediatric population studied, in 2nd position comes *Endolimax nanus* with a frequency of 20% (n = 30) and a general prevalence of 7%, in 3rd position we find *Entamoeba coli* with a frequency of 10% (n = 15) and a general prevalence of 3%, in last position comes *Pseudolimax butschlii* with a frequency of 2% (n = 3) and a general prevalence of 1% (Figure 1). In the pediatric population, the average age was 9 years (1 – 17 years), with a sex ratio of M/F = 1.2.

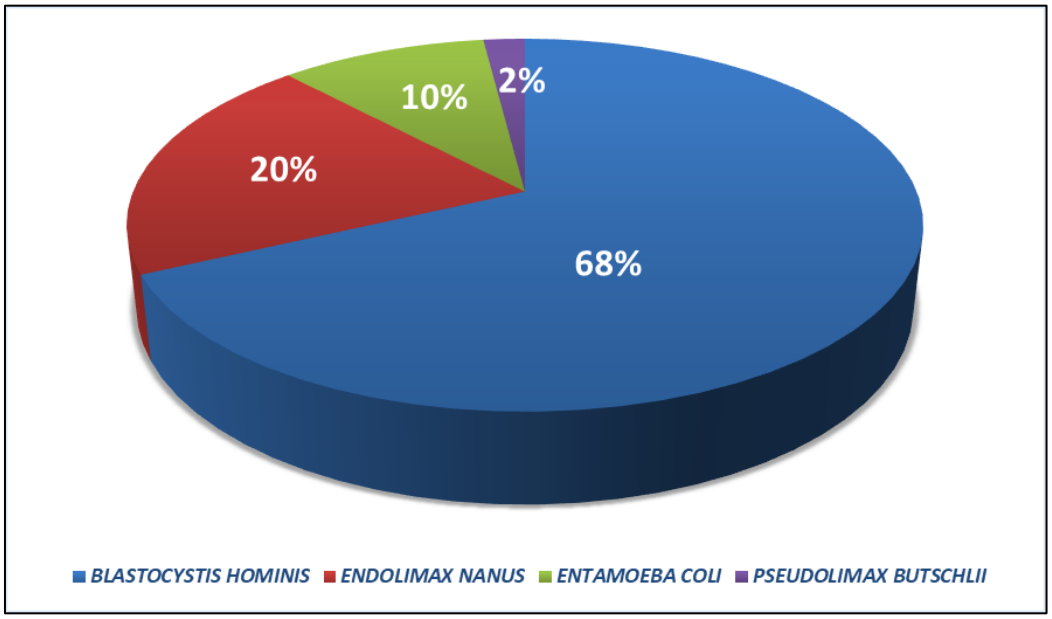

Figure 1 Frequency of non-pathogenic intestinal protozoa in children.

3.2. Adult cohort (18 to 98 years)

In adults, we performed 2325 parasitological stool examinations, of which 39% were positive (n = 900). *Blastocystis hominis* was also the most frequent parasite representing 65% of the non-pathogenic parasites isolated (n = 582), with a prevalence of 25% in the adult population studied, in 2nd position comes *Endolimax nanus* with a frequency of 22% (n = 201) and a general prevalence of 9%, in 3rd position we find *Entamoeba coli* with a frequency of 9% (n = 84) and a general prevalence of 4%, and unlike the pediatric population in adults, the last position was occupied by *Chilomastix mesnili* with a frequency of 4% (n = 33) and a general prevalence of 1% (Figure 2). Among adults, the average age was 55 years (18 – 98 years), with a sex ratio of M/F = 0,91.

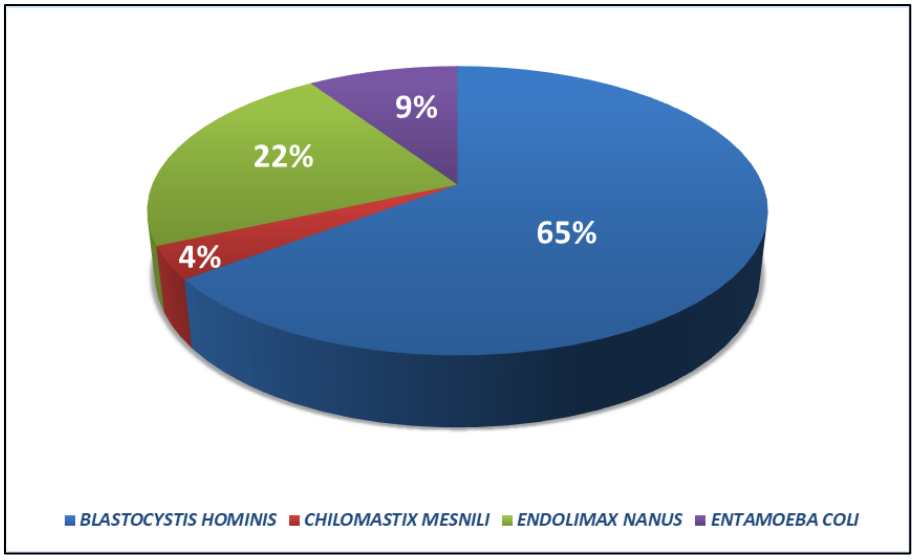

Figure 2 Frequency of non-pathogenic intestinal protozoa in adults**.**

For each parasite, we compared the frequencies observed in children and adults to conclude whether there was a significant difference in the carrier frequencies in these two populations. To make these comparisons, we used a parametric statistical test called "the comparison test of two observed frequencies" using the XLSTAT™ statistical software, which is based on the null hypothesis H_0 ($\pi A = \pi B$), and the alternative hypothesis H_1 ($\pi A \neq \pi B$) to be able to interpret the statistical test (πA = frequency of parasite X in children and πB = frequency of parasite X in adults). The results of these tests are mentioned in the tables (Table 1, Table 2).

Table 1 Comparison of frequencies observed in children and adults with levels of significance.

Type of parasite	Frequency (Children)	Frequency (Adults)	P-Value	significance
Blastocystis hominis	22%	25%	0,238	No
Endolimax nanus	7%	9%	0,136	No
Entamoeba coli	3%	4%	0,835	No
Chilomastix mesnili	0%	1%	<0,0001	Yes
Pseudolimax butschlii	1%	0%	0,164	No

Table 2 Levels of significance and results interpretation.

Type of parasite	P-Value	significance	Interpretation
Blastocystis hominis	0,238	No	Given that the calculated p-value is greater than the significance level threshold alpha = 0,05, we cannot reject the null hypothesis H_0.
Endolimax nanus	0,136	No	Given that the calculated p-value is greater than the significance level threshold alpha = 0,05, we cannot reject the null hypothesis H_0.
Entamoeba coli	0,835	No	Given that the calculated p-value is greater than the significance level threshold alpha = 0,05, we cannot reject the null hypothesis H_0.
Chilomastix mesnili	<0,0001	Yes	Given that the calculated p-value is lower than the significance level alpha = 0,05, we must reject the null hypothesis H0, and retain the alternative hypothesis H1.

Pseudolimax butschlii	0,164	No	Given that the calculated p-value is greater than the significance level threshold alpha = 0,05, we cannot reject the null hypothesis H_0.

4. Discussion

According to these results, it is noted that there is no significant difference in the frequency of carriage of these intestinal protozoa between children and adults and that there is no privileged predisposition to contract these parasites depending on age, except *Chilomastix mesnili* where the statistical test revealed a significant difference in frequency between children and adults in favor for adults who seem to be more exposed to harboring this parasite according to our study ($p < 0.0001$). Other studies suggest, on the contrary, a significant difference in the frequency of these intestinal parasitosis between children and adults in favor of children who seem to be the most exposed to harboring these parasites (5)(6).

5. Conclusion

Apart from *Chilomastix mesnili* which seems to be more frequent in adults, the frequency of parasitic carriage of non-pathogenic intestinal protozoa is practically identical in the pediatric and adult populations, which suggests that infestation by these parasites occurs early in childhood and continues into adulthood because these two populations live in the same urban area, which maintains the infestation circuit that starts from childhood to adulthood with similar frequencies. To break this infestation circuit, it is necessary to treat patients especially symptomatic, fight against fecal peril, and reinforce individual and collective hygiene.

Compliance with ethical standards

Acknowledgments

We would like to thank all the staff of the Parasitology/Mycology Laboratory of the Mohammed VI University Hospital in Oujda. Similarly, we would like to express our gratitude to the Director of the institution for allowing us to carry out this study.

Disclosure of conflict of interest

The authors declare that they have no competing interests.

Statement of ethical approval

Our institution's guidelines do not require the ethics committee's approval for anonymous samples.

Funding Source

No funding was received for this study.

References

[1] Tligui H, Agoumi A. PREVALENCE DU PORTAGE PARASITAIRE INTESTINAL CHEZ I ' ENFANT SCOLARISI A TIFLET (MAROC). 2006;2004–7.

[2] Ahmed O, Cheikh S, Mohamed B, Ba O, Mouhamedou K, Elhdj D. Prévalence des parasitoses intestinales chez les écoliers dans les Wilayas du Gorgol , Guidimagha et Brakna (Mauritanie). RFL Rev Francoph des Lab [Internet]. 2012;2012(440):75–8. Available from: http://dx.doi.org/10.1016/S1773-035X(12)71367-9

[3] Studies A. Etude épidémiologique des parasitoses intestinales humaines au niveau du C . H . U . d ' Oran (Algérie) [Epidemiological study of human intestinal parasitosis in the Hospital of Oran (Algeria)]. 2013;2(4):613–20.

[4] Bouratbine A, Aoun K, Siala E, Chahed MK, Hassine L Ben, Meherzi A. P our une meilleure estimation de la prévalence du parasitisme intestinal dans la région de Tunis . 2000;(1):353–5.

[5] El Guamri Y, Belghyti D, Achicha A, Tiabi M, Aujjar N, Barkia A, et al. Enquête épidémiologique rétrospective sur les parasitoses intestinales au Centre hospitalier provincial El Idrissi (Kénitra, Maroc): Bilan de 10 ans (1996-2005). Ann Biol Clin (Paris). 2009;67(2):191–202.

[6] El-fadeli S, Bouhouch R, Lahrouni M, Chabaa L, Asmama S, Fdil N, et al. La prévalence des parasites intestinaux chez les enfants d ' âge scolaire dans une région rurale de Marrakech-Maroc [The prevalence of intestinal parasites in school children in a rural region of. Int J Innov Sci Res. 2015;19(2):229–34.