Journal Homepage: - www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/22365
DOI URL: http://dx.doi.org/10.21474/IJAR01/22365

RESEARCH ARTICLE

EPIDEMIOLOGICAL PROFILE AND ETIOLOGICAL OF INTESTINAL DISEASE FROM THE CHILDREN IN MAURITANIA. 3 YEARS REVIEW AND 6 MONTH IN LABORATORY OF MOTHER AND CHILD HOSPITAL CENTER INTESTINAL PARASITOSIS IN CHILDREN IN MAURITANIA

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Manuscript Info

Manuscript History
Received: 6 October 2025
Final Accepted: 8 November 2025
Published: December 2025

Key words:-
Entamoeba hystolitica, Salmonella spp, etiology

Abstract

Introduction: The intestinal infection form an important reason of consultation in the laboratory of the Mother and Child Hospital Center of Nouakchott (CHME).

Objectif : it's about determine the etiological of microbiological exams of stools from children aged 0 to18 years between august 2015 and February 2019.

Methodological: it's retrospective study based on data register of microbiological saddle examination for the register and informatics system of laboratory in the center hospital mother and child of Nouakchott (CHME).

Result: in total 266 children on 702 presented an intestinal infection were a prevalence of 37, 9%. The boys presented a prevalence of 40, 1% then the girls have a prevalence of 35, 9. Aged bridge [3-6 years] and [12-17 years] are the most touched with respective prevalence of 53,10% and 52,5The infectious etiology is domined by Entamoeba coli with 31,95%, after intestinal Giardia with 26,30%, after Entamoeba hystolitica then gender levure Candida 8,27% and Salmonella spp with 7,14%.

Conclusion: The intestinal parasitosis are more important from the children at Nouakchott and it is necessary to take them in charge by the sanitaries authority.

Introduction:-

Different micro- organic can cause intestinal infections , it can be parasites, bacteries, virus or champignons. The pathology mechanism is variable could go to gastro-enteritis to an inflammatory of digestive tract and it touches all the digestive tract compartments. The most common symptoms are diarrheas, vomiting and abdominals pain. [1,2] Bacterias are more often responsible of acute infection but rarely chronic infection [2]. In the developing countries these acutes infections are responsible about 1,8 million death per years among the children aged less than 5 years. [3] Intestinals infections are more often due at poor food hygiene and they touch around 30% of people every year and OMS estimated those intestinal infection train more of 2 million death per years. [4]Among the contributing factors of intestinal infection, an immunosuppression (SIDA) and specially the children aged [1, 5, 6].Bacterials

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infections are often caused genus species bacterials Campylobacter, Yersinia, Salmonella and Schiguella. They manifest themselves by acute diarrhea, abdominal pain and fever with loses stools sometimes mucus and or sangole. The acute diarrheas are responsible one third of death by dehydration in the developing countries and especially from children. [1, 7]Intestinal parasitosis affects mainly the children who have poor alimentation hygiene thus contact frequency with the ground, most parasitosis can be asymptomatic with low prevalence (ex. le Trichocéphalose) while others cause severs troubles in case of massive infestation such as occlusion due to ascaridiose and amoebic dysentery [8]. The size of these pathogens agents varies from micrometers to more meters and they are grouped into protozoa and metazoan and the pathology of these paresis depended to their intestinal location [9,10].

The intestinal parasitosis represent 25% to whole infectious diseases in the world [10]. The Mondial organization of health (OMS) estimed in 2002, 3 to 5 milliard people were infected and 450 million of them have developed a pathology from these infections [9].In sub-Saharan Africa, particularly the children in school age are affected in disproportionally way by geo-helminthiases infections. OMS estimate more than 270 million of preschool children and more than 600 million educated children live in parasitic high transmission zone. And the chiffre of death per years is estimated to 155000 case [9,11].Amoebiasis due to Entamoeba histotytica is the third death cause by parasites disease after the paludism and the schistosomiases and affect around 180 million people every year , as to giardias, it is principal cause to diarrhea and affect around 200 million people in the world [12]. According to OMS the ascaris, ankylostomes, dysentrics amoebas and flogellums would cause per year alone 195000 death in the world [13].The intestinal parasitis in Mauritania are poorly documented; we could not find national data that allowed us to know the impact of intestinal parasitis in the country. We have done a retrospective analysis of loose stools exams in the laboratory of hospital center Mère et Enfant of Nouakchott with the aim to obtaining an etiology profile of intestinal infection from the children.

Methodology:-

Type of study: we have performed a retrospective study, descriptive and analytical over the period of 3 years and 6 months, going from august 2015 to January 2019.

Framework and population: we have included all children aged of 0 to 17 years examined in laboratory service of child and mother center Centre of Nouakchott over a period going from august 2015 to february 2019as part of a request exam of microbiology saddles.

Data resource and measure: to achieve the objectives of examination, we referred to coprological of examination register of labotory and digital register of intranet hospital. For every patient, we transcribed on the registration form, collected the sociodemographic data (age and gender) of intranet and biological data (the appearance of the saddles, the results of microscopic exams and culture) bench register.

Data analysis:-

Data entry and statical analysis are realized using the software SPSS 20.0. for descriptive study , qualitative variables are reported by percent, while quantitative variables are reported on overage with their differences types. For analytical study, the comparisons are made by Chi-deux ($\chi Â^2$) test for qualitative data, and by t of Student test for quantitative data. Significance level are fixed to 5%.

Microbiological analysis of samples:-

Sampling:-

Samples of saddles are taken in sterile transparent jars at laboratory or at patient home then achemined at laboratory as soon as possible.

Macroscopic examination of sampling:-

The first step is macroscopic examination of saddles by visual observation to define saddles aspect , we can have several saddles consistency (mold, pasty , diarrhea and liquid) with presence or no blood or mucus sells diarrhea saddles and liquid will be cultivate on environment SS and HK to research pathogenic bacteria .

Direct microscopic examination and after concentration:-

For doing direct examination, a small representative portion of stool is mixed a drop of saline solution on blade, covered of lamella and observed under microscope at the objective x10 and x40. Direct examination stool allow to put in evidence the presence of trophozoite living in stool, to do qualitative and quantitative cytology and to put in

evidence the presence of yeast. In case of presence of yeast in stool we going to perform a culture in Sabouraud-Chloramphénicol area.
For enrichment stool, we used Ritchie modified method who allow to see and identify easier the kyste and parasite eggs present in stool.

Culture:-
Diarrhead stools and liquid are seeded systematically in SS area and HK area to research the presence of Salmonella or Shiguella, in case the presence of yeast to direct examination a culture on Sabouraud-Chloramphénicol is done to identify the yeast of genre Candida.

Conflits of interest:-
Authors do not declare any conflict of interest

Contribution of authors:-
All authors participed to the conception and the implementation of the work, they have also read and approuved the final version of manuscript.

Tables and Figures:-

Table I: Prevalence of intestinal infection according to age and sex

AGE (ANS)	BOYS	POSITIF	FREQUENCY	GIRLS	POSITIF	FREQUENCY	TOTAL	POSITIF	FREQUENCY
[1 - 2]	64	23	35.9%	5	1	20%	69	24	34.7%
[3 - 6]	68	43	63.2%	77	34	44.15%	145	77	53.10%
[6 - 11]	187	64	34.2%	261	80	30.6%	448	144	32.1%
[12 - 17]	5	3	60%	35	18	51.4%	40	21	52.5%
TOTAL	324	130	40.1%	378	136	35.9%	702	266	37.9%

Table II: distribution of intestinal infection according to stool appearance

Appearance	total	Frequency (%)	Positif	Percentage (%)
Mold	120	17,1%	40	33,3%
Diarrhead	104	14,8%	53	50,9%
Liquid	30	4,3%	10	33,3%
Mucus	70	10%	21	30%
Pasty	378	53,8%	130	34,4%
Total	702	100%	266	37,9%

Table III: species spectra and there appearance of according

Epecies	Number	(%)	Mold (%)	Diarrhead (%)	Liquid (%)	Mucus (%)	Pasty (%)
Entamoeba coli	85	31.95%	16(18.8%)	13(15.3)	1(1.2%)	6(7.05%)	49(57.6%)
Entamoebahistolitica	52	19.54%	8(15.4%)	9(17.3%)	2(3.8%)	7(13.4%)	26(50%)
Entamoebadispar	4	1.50%	0	1(25%)	1(25%)	0	2(50%)
Giardia intestinale	70	26.31%	12(17.1%)	22(31.4%)	3(4.28%)	2(2.8%)	31(44.3%)
Trichomonas intestinale	4	1.50%	0	4(100%)	0	0	0
Isospora	1	0.37%	0	0	0	1(100%)	0
Hymenolepus nana	5	1.87%	1(20%)	0	1(20%)	0	3(60%)
Ascaris lumbricoides	2	0.75%	0	0	0	0	2(100%)
Candida albicans	12	4.51%	2(16.6%)	1(8.3%)	2(16.6%)	0	7(58.3%)
Candida spp	10	3.75%	2(20%)	1(10%)	1(10%)	2(20%)	4(40%)
Salmonella spp	19	7.14%	0	8(42.1%)	3(15.8%)	6(31.6%)	2(10.5%)
Shiguella spp	2	0.75%	0	2(100%)	0	0	0
Total	266	100%	41 (15,41%)	61 (22,93%)	14 (5,26%)	24 (9,02%)	126 (47,36%)

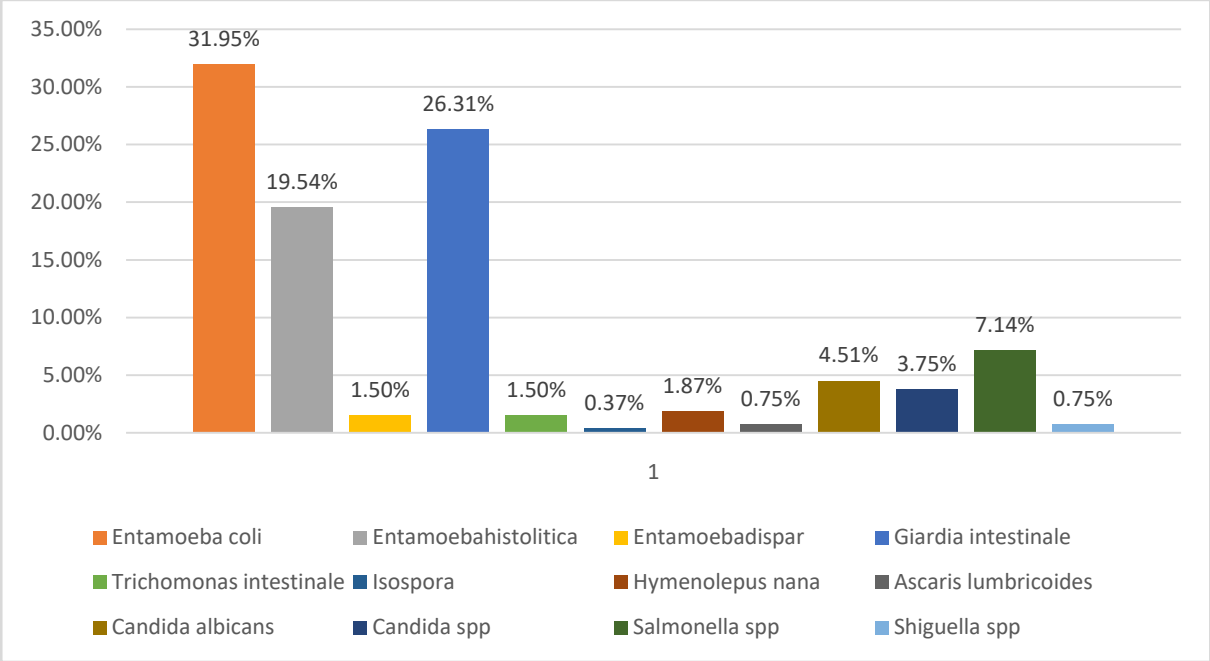

Figure 1 : Found species spectra

Results:-

Results analysis of microbiological stool examination at the level laboratory of center Hospitalier Mère et Enfants of Nouakchott over the period going to 01 august 2015 to 31 January 2019 allowed of enlisted 702 children aged of 1 to 17 years (Table I). Average age of our people is 9.36 years and the ratio sex of 0.85 in girls favour (324/378). The age group more represented is that of [6-11 years] with 63.8% cases (N= 448) followed by those aged of [3-6 years] with 20.6% cases (N=145).Stool appearance of macroscopical examination showed a predominance of pasty stool with 53.8% cases (N=378) ; followed of mucus stool with 17.1% cases (N=120) and diarrhead stool

with 14.8% cases (N=104). (Table II)The prevelance of intestinal infection for our people is 37.9% (n=266), average to age, the prevalence is higher from the children aged of [3-6 years] with a prevalence of 53,10% followed of those aged [12-17 years] with a prevalence of 52.5% and last position the children aged [1-2 years] with a prevalence of 34.7%.According to sex, the prevalence of intestinal infection is higher from the boys with 40.1% while for girls it is 35.9%.According of stool appearance , the prevalence of intestinal infection was higher when the stool are diarrhead with 50.9% followed of pasty stool with 34.4% then mucus stool and liquid stool who had a prevalence of 33.3% and at last position we have mucus stool with a prevalence of 30%. (Table II)
Direct microscopical examination and after enrichment allowed to do in evidence a broad spectrum of parasites, dominate by amoebas with 53% of intestinal infections (N=141), the amoebas species are dominated by Entamoeba coli with 31.95% cases (N=85), suivis Entamoeba histolitica then Entamoeba dyspar with 1.5% cases (N=4). (Figure 1)

After the amoebas come the flagellates who represent 27.8% cases (N=74), they are as for her dominated by the Giargia intestinalis with 26.31% cases (N=70) followed of Trichomonas intestinal with 1.5% cases (N=4). (Figure 1)We have also observed helminths and sporozoaires, the helminths represent 2.63% cases (N=7) dominate by Hymenolepus nana with 1.87% cases (N=5) and Ascaris lumbricoides with 0.75% cases (N=2) and the sporozoaires represent0.37% cases (N=1) it's about of one case Isospora beli. (Figure 1)The coproculture allowed to identify pathogenic bacteries in 7.9% cases (N=21) it's about basically Salmonella spp who represent 7.14% cases (N=19) and Shiguella spp who represent 0.75% cases (N=2) and yeast who they are genre Candida and represent 8.27% cases , dominate by the Candida albicans with 4.5% cases (N=12) while the Candida no albicans represent 3.75% cases (N=10). (Figure 1)According to stool appearance , most germs were more frequently found in pasty stool except Trichomonas intestinal, Salmonella spp and Shiguella spp find mostly in diarrhead stool and Isospora beli who are found mostly in mucus stool . (Table III)

Discussion:-

We have done a retrospective study descriptive on 702 samples of children stool aged of 0 to 17 years exanimated at level of laboratory in Center Hospitalier Mère et Enfant of Nouakchott, over a period 3 years and 6 month , going to 01/08/2015 to 31/01/2019. The macroscopical examination have done to determinate stool appearance then microscopical examination for highlighting the trophozoite and yeast. And the Richie modified method was used for identification kystes and eggs . The identification of yeast and bacteries was obtained after culture on specific area.

Overall prevalence of intestinal infections for our people is 37,9 %, it's close of more studies particulary that reported by Saotoing P and al at Cameroun with 35.38% (14), to that reported by Sylla K and al in Senegal who got 35% (15) and that reported by Menan EIH and al at Côte d'Ivoire with 36,64% (16)Our prevalence is superior to that found by Baba O.A.S and al from school children of Guidimakha region Barakna and Gorgol in (Mauritania) who is 33,4 % (16). But also by several others studies particulary by that Guamri Y.E and al at Marocco who got a prevalence of 16.38% (18) from the children aged less than 18 years , that Diouf JB and al in Senegal who got 27.5% (10) from the malnourished children , that N. Belhamri and R. Mouta who got 24% to Marrakech(Maroc) (19) from the children aged of 3 month to 16 years ,by Soumana A and al at Niger who got 33% (20) from children less than five years and in Tunisia or Emma S and al obtained a prevalence of 12,5% (21).

The result of our study is inferior to the prevalence found by Cissé M and al in Burkina Faso with 54,7%(22), by Diouf JB and al in Senegal with 45,5 %.(23), by Tegen D and al and by Araya G.W and al in Ethiopia who got respectively 62,3% (11) and 58%(24), by G. Tékpa and al in Centre Afrique with 88,23% (12), by Yaro A.S and al in Mali with 46.5 %(9) from the person aged of 1-21 years , by Dancesco P. and al in Côte d'Ivoire with 84.8%(25) and by Benouis A. and al in Algeria (26) who reported a prevalence of 19,9% in Oran ??? to check because inferior to our Prevalence. The prevalence of intestinal infection is very variable depending on the diagnostic methods , the study people and the study period . According to age , the age group [3 to 6] years is most touched with a rate of 53,10% followed that [12 to 17] years with 52.5% and age group [1 to 2] years is less touched with 34.7%. Our results are close of that reported Araya G.W and al (24) in Ethiopia with a prevalence higher from the children aged of 4 to 5 years , that Dancesco P and al in Côte d'Ivoire with a prevalence higher in age group [7 to 10] years and [11 to 15] years (25) and that of Sarmila T. and al in Nepal who got a prevalence higher in age group [6 to 10] years and [11 to 15]years (27). The weak prevalence from the children

aged of less 2 years can explain by the fact that it is all above to leave then the children start to play and to eat à outside after the weaning .

Others studies on the others hand relate prevalence higher from the children aged over of 10 years such as Diouf JB and al in Senegal (10) with 36.8% and Ould Abdallah M and al during a masse survey in Mauritania in 2010 (28) While in other study , the prevalence is most important from the children aged of 1 to 5 years particulary the one of Diouf JBN and al in Senegal with a prevalence of 70% (23), Tékpa G and al with 42.14%(12), Soumana A and al the children aged of 1 to 24 mois are the most touched with 51.1% cases(20).The prevalence of intestinal parasitosis from the boys is 40% while from the girls it's 35.9%, our result is close to that Ould Ahmaed Salem and al (17),of Diouf JBN and al au Senegal(22, it is rather 23, it's good to check the concordance of bibliographic reference) and Boi Koné and al in Mali(29)According to stool appearance, the prevalence of intestinal parasitosis is most important at stool diarrhead level with 50,9% followed pasty stool with 34,4%, mold stool and liquid stool with 33,3%. The Predominance of intestinal infection at diarrhead stool level is maybe said to intestinal infection manifests often by a diarrhead syndrome and des abdominal aches . our result is confirmed by Guamri Y.E and al in Maroc (18), by Yaro AS and al in Mali (9) and b y Sakkali H.E.B and al in Maroc (30). On the other hand for G. Tékpa and al in Centre Afrique(12) and Boi Koné M et al (22, it is rather 29, it's necessary to check the concordance of bibliographical reference) rapport respectively a prevalence higher for pasty stool and liquid stool.

The germs encountered are dominated by protozoa with 81% followed yeast with 8,27% then enterobacteria with 7,9% and heminths with 2,63%, the predominance of protozoa is found in others Mauritanian study particularly that Ould Abdallah and al in 2010 (28) and Baba OASC in 2012 (17) with a prevalence of protozoa respectively 59,6% and 93,75% but also in Senegal by Thiongane P and al in 2019(31), at Marocco by Guamri Y.E and al in 2009 (18), at Mali by Yaro A.S and al (9) and Burkina by Erismann S and al (32).On the other hand others studies show a predominance of helminth on the protozoa particularity Tegen D and al (11) in Ethiopia , Diouf NJB and al (10) in Senegal and André Edouard and al in Martinique(33).Protozoan species are dominated by 'Entamoeba Coli with 31,95% (n=85) followed by Giardias intestinal with 26,31% (n=70) followed by Entamoeba histolitica 19,54% then Entamoeba dispar 1,5% and Trichomonas intestinal with 1,5% des cas (n=4), our result is close to the results of two other studies carried out in Mauritania by Ould Abdallahi and al(28) and Baba O.A.S.C and al(17) as well as to Burkina by Sangaré and al (34) and in Senegal by Thiongane P and al(31).

On the other hand in many others countries the results are different with a predominance of Entamoeba hystolitica notably in Marocco by Guamri Y.E and al (18), in Mali by Yaro A.S and al (9), at Burkina by Erismann S and al (32) and Cameroun by Saotoing P and al (14) while for Tékpa and al in Center Africa (12) , the Ascaris lumbricoïdes is the species more found and Belhamri N and al in Marocco reports a predominance of Giardia intestinal(19) The Helminth represent 2,63% (n=7) are dominated by Hymenolepus nana 1,87% of cases (n=5) and Ascaris lumbricoïdes 0,75% (n=2), our result is identical to the one of Baba O.A.S.C and al (17) and close to the one of Ouldabdallah and al (28) who has a predominance of H. nana followed to Strongyloides stercoralis but both have prevalence of geohelminthiasis superieur to ours . the predominance of Hymenolepus nana is also found in Burkina by Ouermi D and all (35).

The most of studies consulted have results superieur to ours and show a predominance of Ascaris lumbricoïdes, notably the Diouf B.N.J study and al in Senegal with 18% for Ascaris lumbricoïdes(10), by Sabonete and al (36) in Mozambique with 65,8% for Ascaris lombricoides, in Marocco by Guamri Y.E and al (18) with 11,87% for Ascaris lumbricoïdes and in Center Africa by Tékpa G and al(12) with 40,1% for Ascaris lombricoïdes. On the other hand in Senegal Ndiaye A and al (37) report the prevalence for the helminthiasis much weaker than we obtained , dominated by Ascaris lumbricoïdes with 0,65% followed to Ancylostoma duodenale with 0,22%.
The bacteria are responsible of 7,9%(n=21) of intestinal infection in our study , they are dominated by Salmonella spp with 7,14%(n=19), followed to Shiguella spp with 0,75% (n =2) our result is different to that reported in Mali by Boi Koné(29) with a predominance of Escherichia coli followed to Salmonella spp and that of Diouf S and al(38) who obtained a rate of bacterial infection to 10,5% dominated by Escherichia coli with 6% followed to Salmonella spp with 3,7% and Klebsiella spp with 0,7%. This difference can be explained by diagnostic of method used.We have obtained a prevalence of 8,27% dominated by the Candida albicans with 4,5% followed to Candida spp with 3,75% our result is close to that reported by Diouf S and all (38) with 7,5% of Candida found in the intestinal infection .

Conclusion:-

Intestinal parasitosis constitute an important factor of morbidities and mortalities in the world , our study show that the prevelance of intestinal parasitosis is more important from the children in Mauritania with a predominance of protozoa .In a context of underdevelopment the negative impact of these intestinal parasitosis can be much more important in terms of morbidity and mortality , hence the need for the Mauritanian government to redouble its efforts in the fight against intestinal parasitosis.

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