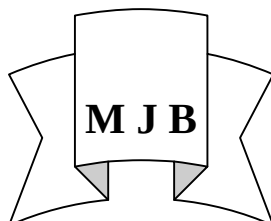


Parasitic etiology of newborn gastroenteritis in Babylon governorate

Ali Hussain M. Al-Marzoqi

Raad A. Kadhim

University of Babylon, College of Science for women, Biology
Department



Abstract

In the present study, 173 children stool specimens less than 12 months of age suffering from diarrhea collected in suitable clean containers and examined firstly macroscopically and then microscopically from Babylon hospital for children and maternity from January/2008 to May/2008. Presenting acute diarrhea was examined to identify associated parasitic Enteropathogens agents. Parasitic causes formed (56%) from all cases represented by; *Entamoeba histolytica* 41.2%, *Ascaris lumbricoides* 32%, *Giardia lamblia* 18.6%, *Trichuris trichura* 6.2% and *Hymenolepis nana* 2%. Parasitic infections in rural newborn revealed (68%) higher than urban cases (31.9%), Parasitic infections with breast feeding are less infected than whom artificial depending feeding (42.2%) and (57.7%) respectively. Most parasitic infection like *Entamoeba histolytica*, *Ascaris lumbricoides*, *Giardia lamblia* and *Trichuris trichura* was higher in patients aged from (9-12 months) formed 70%, 64.5%, 55.5% and 100% respectively.

الخلاصة

في الدراسة الحالية، تم جمع ١٧٣ عينة براز من أطفال حديثي الولادة لا تتجاوز أعمارهم السنة مصابين بالإسهال الحاد في حاويات معقمة ونظيفة مخصصة لهذا الغرض. تم فحص العينات عياناً (اللون، الرائحة، وجود كريات الدم الحمر والبيض) ومن ثم فحصت مجهرياً. تم جمع العينات في الفترة ما بين كانون الثاني/٢٠٠٨ إلى أيار/٢٠٠٨ من مستشفى بابل للنسائية والأطفال في محافظة بابل. بينت الدراسة أن الطفيليات كانت مسؤولة عن (٥٦%) من حالات الإسهال الكلية ونسب الإصابة بالطفيليات كانت كما يلي:

Entamoeba histolytica ٤١,٢% ، *Ascaris lumbricoides* ٣٢% ، *Giardia lamblia* ١٨,٦% ، *Trichuris trichura* ٦,٢% ، *Hymenolepis nana* ٢%. في المناطق الريفية كانت نسب الإصابة الطفيلية (٦٨%) أعلى من المصابين في المناطق المدنية (٣١,٩%)، كانت نسبة الإصابة الطفيلية في الأطفال ذوي التغذية المعتمدة على الرضاعة الطبيعية أقل من المعتمدين على التغذية الاصطناعية (٤٢,٢%) و (٥٧,٧%) على التوالي. معظم الإصابات الطفيلية في الأطفال حديثي الولادة مثل *Entamoeba hitolytica* ، *Ascaris lumbricoides* ، *Giardia lamblia* و *Trichuris trichura* كانت أعلى في الفئات العمرية (٩-١٢ شهراً) حيث كانت ٧٠% و ٦٤,٥% و ٥٥,٥% و ١٠٠% على التوالي.

Introduction

Diarrhoea is a major cause of childhood morbidity and mortality in socio-economically developing countries. More than one billion episodes of diarrhoea occur every year among children under five years of age

causing approximately 2.5 million deaths [1,2].

Acute diarrhoea in tropical countries can be caused by a broad spectrum of viral, parasitic, and bacterial Enteropathogens [3,4]. Persistent and recurrent acute diarrhea is one of the three major causes of morbidity and

mortality in the world and accounts for an estimated annual five million deaths among infants under 5 years, diarrhea continues to be endemic in some tropical and subtropical areas and is one of the leading causes of disability-adjusted life years [5].

The etiological agents of diarrhoea described in epidemiological studies are transmitted as waterborne and food borne, some food borne pathogens have been recently considered as emerging diseases [6]. Diarrhoea can also be caused by protozoa such as *Entamoeba histolytica* and *Giardia intestinalis*, these zoonotic parasites are frequently transmitted by consumption of water contaminated with infective cysts [7].

Besides mortality, the long-term effects of diarrhoeal illness on childhood health are extremely serious and include malnutrition and growth faltering. Further attention to the causes of diarrhoea is important to develop preventive measures. Aetiology of diarrhoea is variable according to geographic and climatic conditions, host factors, and socioeconomic situations. It is important to establish the causative agents of diarrhoea across different settings and populations [8].

Materials and Methods

A total of 173 stool samples were taken from newborns (less than one year old) suffering diarrhea from Babylon hospital for children and maternity. The samples were collected in suitable clean containers and examined firstly macroscopically (inspection of consistency, color, odor and presence of blood or mucus) and then microscopically [9]. The direct smear method in 0.85 % sodium

chloride (0.85 gm NaCl dissolve in 100 ml distilled water) and Iodine solution (Iodine 1gm and potassium iodide 2 gm dissolve in 50 ml distilled water) and saturated salt flotation method (prepared by dissolving 33 gm of Zinc sulphate in 100 ml of distilled water).

Results and Discussion

The Rate of parasitic infection among newborn of the 173 patients with acute diarrhoea formed 56% (97) from all diarrhoeal cases, this result is agreed with Tinuade *et al.* 2006[10] and 44% (76) from diarrhoeal cases belong to other causatives. In table (1), Parasitic diarrhea represented by protozoa and helminthes infections; *Entamoeba histolytica* 41.2% , *Ascaris lumbricoides* 32% , *G. lamblia* 18.6%, *Trichuris trichura* 6.2% and *Hymenolepis nana* 2%. *Giardia lamblia* and *Entamoeba histolytica* was the major cause of parasitic infection among diarrhoeal cases [11,12]. *Ascaris lumbricoides* doesn't cause diarrhea [7] but in This study revealed that 32% (31) cases caused by *Ascaris lumbricoides* associated with other parasite causing diarrhea such as *Giardia lamblia* and *Entamoeba histolytica* .

All parasite species in this study are mentioned in Tinuade *et al.* study 2006. The low prevalence of helminthes in childhood diarrhea was most likely due to the 'culture' of rampant medication of children with anti-helminthes by most mothers at the slightest indication of ill health [10]. This is due to the widespread unrestricted access to drugs in Babylon, like most other developing countries and increased awareness about helminthiasis.

Table (1) Types and percentage of parasitic infection among children isolates from Stool samples

Parasite	No.	%
<i>Entamoeba histolytica</i>	40	41.2
<i>Ascaris lumbricoides</i>	31	32
<i>Giardia lamblia</i>	18	18.6
<i>Trichuris trichura</i>	6	6.2
<i>Hymenolepis nana</i>	2	2
Total	97	100

Diarrheal disease was found a year round, in both urban and rural settings [13]. Residential distribution of parasitic infection were influenced by many factors, the percentage of the parasitic infection in the rural area was higher than that in the urban area 68% (66), 31.9% (31) respectively, could be explained by the fact that many families used stored water in their tanks or directly from river which was more prone to contaminate, and this increase the possibility of infection.

Table (2) Distribution of Diarrheal cases with parasitic infection among children according to residence.

Diarrheal cases \ Residence	Rural		Urban %		Total	
	No.	%	No.	%	No.	%
Parasitic	66	68	31	31.9	97	100
Non Parasitic	48	63.1	28	36.8	76	100
Total	114	65.9	59	34.1	173	100

Type of feeding are very important factors influence on the ratio of infection with diarrhea. In this study parasitic infections with breast feeding were lower than with artificial feeding pattern 42.2% (41) and 57.7% (56) respectively, this high difference could be explained by the clean, immunized and fresh feeding that received from mother in contrast with artificial feeding because using contaminating water or solid food In addition to the personal hygiene of the family. using solid food increasing the possibility of food born diseases or waterborne diseases. It was remarkable that early cessation of breastfeeding was associated with parasitic diarrhea. Although there was no such association with bottle feeding and day care centre attendance, it is plausible to infer that early cessation of breastfeeding deprived these children of the protective effects of breast milk. It also exposed them to alternative methods of feeding which encouraged contact with the parasites which are endemic in this environment. This has a direct bearing with the standard of living of the people, hence, the association of parasitic diarrhea with malnutrition and low socio-economic status as observed in this study. Interestingly, diarrheal diseases generally had earlier been shown at the same centre to be worse among children of poor background. These children are usually undernourished and prone to pica, hence, the ingestion of the ova and cysts of parasites [14]. Our result is nearly agreed with Al Kelaby 1999 [15].

Table (3) Distribution of Diarrheal cases with parasitic infection among children according to type of feeding.

Diarrheal cases \ Feeding type	Breast		Artificial		Total	
	No.	%	No.	%	No.	%
Parasitic	41	42.2	56	57.7	97	100
Non Parasitic	12	15.7	64	84.2	76	100
Total	53	30.6	120	69.4	173	100

Parasitic diarrhea had been reported to affect all ages [16]. Table 4 shows the percentage of each causative parasite with age of newborns, its explain that most parasitic infection like *Entamoeba histolytica*, *Ascaris lumbricoides*, *Giardia lamblia* and *Trichuris trichura* was higher in patients aged from (9-12 months) formed 70%, 64.5%, 55.5% and 100% respectively. Explanation of these results ; It is often found that parasitic infection revealed before and after infancy in concordance with author's findings [12, 15, 17]. Perhaps, the

increased explorative tendencies at this age heighten the risks of feco-oral transmission of the ova and cysts of parasites [18].

The infections with *Ascaris lumbricoides* in lower ages(less than one month) were very rare [11,12] because the worm have need of 14- 19 days to develop into adult in small intestine and become sexually mature in about 6-12 weeks to start laying eggs[19] , in this study the presence of *Ascaris lumbricoides* in lower ages could be explained by the mistakes when obtained the questionnaire from the parents about ages of their sons.

Table (4) Distribution of Parasitic Diarrheal cases infections according to age (months)

Parasite \ Age (months)	< 1		1-4		5-8		9-12		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
<i>Entamoeba histolytica</i>	2	5	-	-	10	25	28	70	40	100
<i>Ascaris lumbricoides</i>	5	16.1	-	-	6	19.3	20	64.5	31	100
<i>Giardia lamblia</i>	-	-	1	5.5	7	38.8	10	55.5	18	100
<i>Trichuris trichura</i>	-	-	-	-	-	-	6	100	6	100
<i>Hymenolepis nana</i>	-	-	-	-	2	100	-	-	2	100
Total	7	7.2	1	1	25	25.8	64	66	97	100

Recommendation

Parasitic agents are significantly associated with childhood diarrhea in this community. Thus, it is conceivable that intestinal parasitic infestation and the attendant diarrheal illnesses can be reduced by improving the level of hygiene (personal and environmental), and nutrition including breastfeeding practices.

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