

**Parasitic infections causing diarrhoea among children less than  
Six years at Al-Nasiriyah province**

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**Abstract**

This study aimed to determine the parasitic agents of diarrhoea in children aged less than six years. Out of 780 cases of diarrhea, 206 (26.41%) had one or more parasitic infections and the remaining 574 (73.58%) had other enteropathogenic agents of diarrhoea. There were 166 (21.98%) protozoal infections and 40 (5.12%) helminthes. Male children were 113(45.8%) and females were 93(44.68%). The most common pathogens were *Giardia lamblia* 117 (56.79%); *Entamoeba histolytica* 49 (23.78%); *Enterobius vermicularis* 27 (13.10%); *Ascaris lumbricoides* 9 (4.36%) and *Hymenolepis nana* 4 (1.94%). Moreover, the highest parasitic infections observed during summer months with bottle-feeding nutrition.

**Key words: Diarrhoea; parasites; children**

**Introduction**

Diarrhoea, especially in children, is a major cause of morbidity and mortality in developing countries; every year more than 1.5 million children under the age of five years die as a result of acute diarrhoea despite the availability of effective low cost therapies to manage diarrhoea cases (Kebede *et al.*, 2004). Diarrhoea can be caused by a wide range of viruses, bacteria, or parasites (Moyo *et al.*, 2011). Intestinal parasites are common in Iraq (Kadir *et al.*, 1993). Intestinal parasites are common in the developing world, presumably due to poor environmental and personal hygiene which largely caused by sewage disposal and

inadequate water supply (Magambo *et al.*, 1998; Tinuade *et al.*, 2006). A large proportion of diarrhoea diseases in children are infective in origin but the etiologies, a few years ago, were largely underdetermined for lack of facilities. Recently, the role of viral agents, especially the Rotavirus as the main causes of childhood diarrhoea, and this has broadened the etiological scope in diarrhoea especially in children (Yousef *et al.*, 2000). On the other hand, under-nutrition remains one of the most serious health problems among preschool children and the single main contributor to child mortality in many low and middle income Arab countries (Musaiger *et al.*, 2011). The aim of this study is to evaluate parasitic enteropathogens among Iraqi children with diarrhoea and to observe a relationship between the type of feeding and parasitic infections especially at Al-Nasiriyah city.

### **Materials and methods**

This study was carried out at Al-Habobbi Hospital for children and maternity from January to August 2007 (8 months period). One hundred and thirteen patients were males and 93 were females, their age ranged from one day to six years. The age, sex, nutritional status, history of breastfeeding and bottle-feeding were obtained for children aged 24 months and below and day care attendance for those aged 36 months and below. Fresh stool specimens were collected directly in sterile screw capped containers and examined microscopically (within 30 minutes) by a direct method using 0.85% saline and lugoles iodine solution (Sood, 2006). Identification of parasites was based on the cysts and trophozoites with respect to protozoal and ova as helminthes parasite (Heyneman, 2004; Forbes *et al.*, 2007) and for the collection of ova of *Enterobius vermicularis* we used the Scotch tape method (Paniker, 2007). The data were analyzed statistically by SPSS statistical programme (version 18), and the comparison between the groups and the relationship were obtained. A p value equal or less than 0.05 was considered to indicate a statistically significant difference.

### **Results**

Over the period of 8 months, 780 children less than six years old were exhibited with acute diarrhoea. Parasitic agents were identified in 206 (26.41%) stool samples while the

remaining 574 (73.58%) had no identifiable parasitic agents. The males children were 113 (54.8%) and the females were 93 (44.6%) (Table 1).

Table 1: Distribution of patients according to gender and age groups

Age groups year	Males	Females
>1	8	6
1 to >2	25	17
2 to >3	22	18
3 to >4	24	16
4 to >5	18	20
5 to >6	16	16
Total	113	93

P <0.05

Table 2 shows the age and the types of parasite, and regarding the majority of cases infections were in age group (1-2 years) and the study indicates that *Giardia lamblia* (56.79% ) represented the highest rate of infection followed by *Entamoeba histolytica* (23.78%); *Enterobius vermicularis* (13.10%); *Ascaris lumbricoides* 9 (4.36%) and *Hymenolepis nana* 4 (1.94%). Figure 1 shows that the incidence of infections with intestinal parasites was obviously high in summer months and among the bottle-feeding children was less than 24 months (Figure 2).

Table 2: Distribution of intestinal parasites among different age groups

Age group/year	<i>G.lambelia</i>		<i>E.histolytica</i>		<i>E. vermicularis</i>	<i>A.lumbricoides</i>	<i>H.nana</i>	<i>Total</i>	
	C*	T**	C	T				No	%
<1	5	6	1	1	Ova	Ova	Ova	14	6.79
1 to <2	16	13	6	4	3	-	-	42	20.38
2 to <3	11	13	5	6	4	1	-	40	19.41
3 to <4	12	11	3	4	6	3	1	40	19.41

4 to <5	10	9	3	5	8	2	1	38	18.44
5 to <6	7	4	5	6	5	3	2	32	15.53
Total	61	56	23	26	27	9	4	206	100

\*C: cyst ; \*\*T: trophozoite; p <0.05

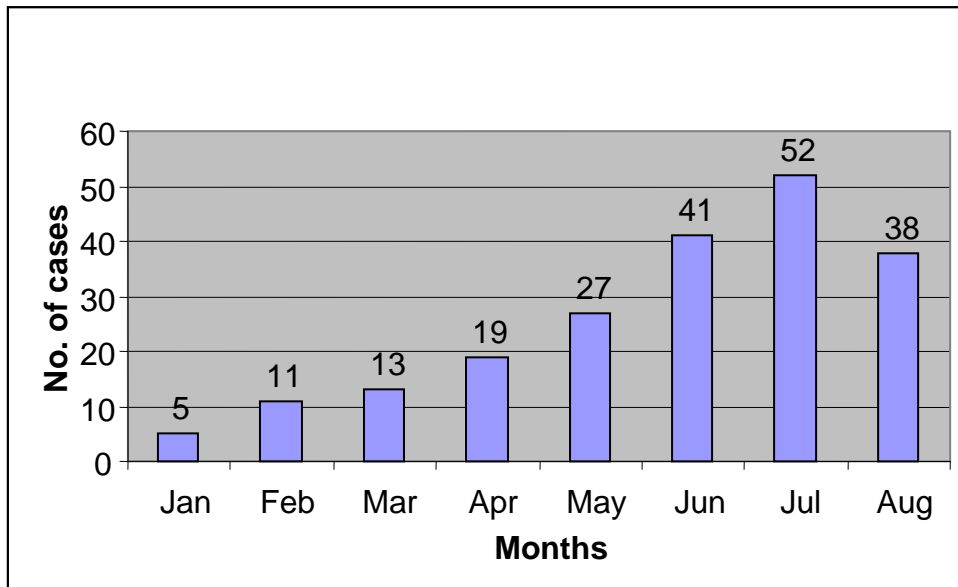


Figure 1: Incidence of parasites infections according to period of study

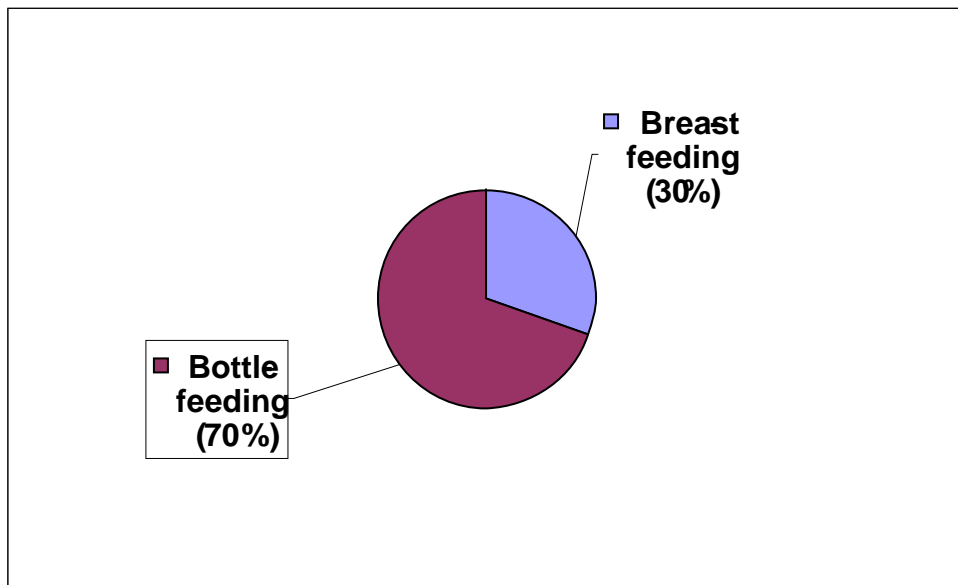


Figure 2: Illustration of feeding patterns among patients with diarrhea

## **Discussion**

The prevalence of intestinal parasites associated with children less than six years old diarrhoeal children in this study was lower (26.41%), than the studies carried out by Adedoyin *et al.* (1990); Ighogbia and Ikeh (1997); Kaur *et al.* (2002) and Throen *et al.* (1982) who found that the percentage of infections were 32.5%, 30.7%, 46.3%, and 70%, respectively. This is may be related to geographical distribution.

Our results have shown that protozoa *G. lamblia* and *E. histolytica* were the most frequent among children. There are no significant differences between them that are prevalent over the helminthes. This goes with Kebede *et al.* (2004) and with Kadir *et al.* (1993). The incidence of infections in males was higher than in females; this finding goes with Mudher *et al.* (1987); Tinuade *et al.* (2006) and Prinker (2006) who found the highest incidence of parasitic infections in males. On the other hand, children under 24 months with the parasitic diarrhoea were higher in bottle-feeding (70%) than breast feeding children (30%). This results agree with Tinuade *et al.* (2006) who referred to that bottle-feeding and early cessation of breast feeding were associated with parasitic diseases, because this kind of feeding which encouraged close contact with the parasites which are endemic in this environment.

The highest rate of infection was among children in the age group 1-2 years. There are no significant differences between them, and according to the age, this is in agreement with other reports (Kadir *et al.*, 1993; Tinuade *et al.*, 2006; Abu-Madi *et al.*, 2010) who show that the increase of explorative tendencies at this age heightens the ova and cysts of parasites. Also, the rate of infection by cysts phase was greater by than trophozoite phase; this finding is similar to other studies (Lindo *et al.*, 1998; Abu-Madi *et al.*, 2010). The high incidence of parasitic diseases in summer months especially during fly seasons and poor hygiene as it is known that flies are capable of carrying cysts and contaminate the food and drink. Cysts are usually ingested through contaminated water, contaminated food; flies have been incriminating in areas of fecal pollution (Sood, 2006).

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مسببات الاسهال الطفيلية عند الاطفال تحت عمر ست سنوات  
في مدينة الناصرية

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الخلاصة

تهدف هذه الدراسة الى تحديد مسببات الاسهال الطفيلية عند الاطفال الذين كانت اعمارهم اقل من ست سنوات. المجموع الكلي لحالات الاسهال التي تم دراستها 780, ظهر منها 206 حالة سببها طفيليات (26.41%) وباقي الحالات 574 (73.58%) كانت مسبباتها غير طفيلية. شكلت الاوالي الطفيلية 166 (21.98%) بينما شكلت الديدان المعوية 40 (5.12%). اظهرت الدراسة ان الاطفال الذكور اكثر اصابة 113 (54.80%) بينما الاناث 93 (44.68%), كذلك فان الطفيليات الاكثر تواجدا هي الجيارديا لامبليا 117 (56.79%), تليها اميبا النسيج 49 (23.78%), الدودة دبوسية 27 (13.10%), الاسكارس 9 (4.36%) ثم الدودة القزمية 4 (1.94%). بالاضافة الى ذلك, اظهرت الدراسة ان الاصابات الطفيلية تكثر في اشهر الصيف عند الاطفال الذين يرضعون رضاعة اصطناعية.