The Epidemiological Aspects Of Infection With Entamoeba Histologica In Acute Diarrhea In Thi-Qar Governorate During The Year 2006.

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الخلاصة:

تم اشراك ٣٦٠٠ مرض مصاب بالإسهال الحاد ممن راجعوا العادة الخارجة في مستشفى الأطفال في الناصرة خلال الفترة من ٢٠٠٦/١/١ ولغاية ٢٠٠٦/١٢/٣٠ في دراسة مستقبلية استهدفت تحديد حجم مشكلة الإصابة بالزحار الأميبي نسبة إلى مشكلة الإسهال الحاد، متضمنة تحديد عوامل الخطورة كالعمر والجنس ومستوى الحالة المعاشية وحجم العائلة، مع بيان تأثير الرضاعة الطبيعية خلال السنتين الأولى من العمر على مدى الإصابة بالمرض المذكور أعلاه .

كانت المجاميع العمرية محصورة بين ٢ شهر – ١٢ سنة. إنّ الإصابة بالزحار الأميبي شكلت (٣٨ر٨%) من كل حالات الإسهال الحاد، ولقد كانت أغلب الحالات محصورة في الفئة العمرية ٢ شهر – ١ سنة (٤٦ر٩%) والفئة العمرية المحصورة بين ١٣ شهر – ٥ سنة (٤٢ر٤٦%) ونسبة أقل في عمر دون ٢ شهر (٣ر١٤%) وفوق ٥ سنوات (٧ر٥%).

لم تكن هناك فوارق مهمة بين نسبة الإصابة في الذكور (٥١ر٧٨%) والإناث (٤٨ر٢%). لقد كانت أغلب الحالات (٦٤ر٢%) من المناطق الريفية.

إن للدخل المعاشي الواطئ وكبر حجم العائلة تأثير مباشر على زيادة عدد الاصابات بالزحار الأميبي. لقد تبين من الدراسة أن الإعتماد على الرضاعة الطبيعية خلال السنتين الأولى من العمر قد قلل كثيراً من الإصابة بالمرض المذكور أعلاه مقارنة بالرضاعة الاصطناعية في نفس الفئة العمرية. بالرغم من إجراء عدة دراسات عن الإسهال الناتج من الإصابة بالأميبا الزحارية في محافظة ذي قار لم تتناول أي دراسة منها حجم المشكلة في الأطفال، بل تناولت أعماراً عشوائية. تم التركيز في هذه الدراسة على الخدمات الوقائية لأنها الطريقة الفعالة للحد من انتشار المرض والسيطرة عليه.

Abstract:

A prospective study conducted on 3600 patients with a cute diarrhea who were attending the out patient's clinic in Al-Nassiriyia pediatric hospital from the period of 1.1.2006 to 30.12.2006 to define the role of E. Histolytica infection in acute diarrhea, with particular concentration on certain risk factors such as age, sex, socio-economic status; family size and place of residence, breast feeding in the first 2 years of life and their effect on the prevalence of infection. Their age groups were from the first week to 12 years. Infection with E. Histolytica was seen in (38.8%) of all cases with a cute diarrhea and affected mainly the age group of 2 months – 1 year (46.9%) and the age group of 13 months – 5 years (42.46%), with less predominant cases were seen below the age of 2 months (3.14%) and above 5 years (7.5%). Males percentage (51.78%) was comparable to that for females

(48.2%). It was found that the majority of cases (64.2%) were from rural areas. Non of the previous studies done in Thi-Qar Governorate had defined the magnitude of the problem in pediatric age group since most were done on random samples of population. In this study the above results may be of help in providing certain recommendations and preventive measures for this infection.

Introduction:

Diarrheal diseases continue to be the major cause of morbidity and mortality in the developing word.(1) Amoebiasis is defined as human infection caused by the parasitic protozoan, E. Histolyica with or with out clinical manifestation.(2) There are two species of entamoeba that are morphologically identical, E. Histolytica and E.dispar.(3) However, only E. Histolytica is capable of causing disease.(3) E. histolytica exists in two forms, cyst and trophozoite, infection is acquired by ingestion of cyst form present infecally contaminated water or food and by food handlers carring the cyst.(4) Infection can be transmitted by person to person contact.(5) The cyst is resistant to enviromental conditions including the concentration of chlorine used in water purification and gastric acid.(4) The cyst upon ingestion, excysts in small intestine to form 8 trophozoites; these are active motile and colonize the lumen of large intestine, their rapid degeneration outside the body or in low PH of stomach make them unable to transmit the infection.(4) Humans are the most significant reservoir of infection, even though morphologically identical amoeba has been isolated from domestic and wild animals.(6) The regional prevalence of amoebic infection world wide varies from (4 – 81%); being as great as 50% in undeveloped areas.(7,8) The majority of amoebic infections reported to occur in central America, south America; Africa and Asia.(5) The prevalence of amoebic infections in Iraq according to previous reports varied between different cities ranging from (1.8%)(9) to (38.9%).(10)

It's estimated that more than 10% of the world population is infected with E. Histolytica resulting in 50 millions cases of invasive disease and up to 100000 death per year world wide.(11) Amoebiasis is the 3rd leading parasitic cause of death world wide.(4) High risk group for infection include; lower socio-economic groups; children in mental institutions; immuno compromised persons, emigrants from and travelers to endemic areas.(4) About 90% of all E. Histolytica infections are a symptomatic.(5) Symptomatic disease occur in 10% of those with E. Histolytica infections.(4) Epidemiological studies abroad showed that 90% of the asymptomatic carriers cleared the infection within a year, the remaining 10% developed colitis.(12) The pattern of intestinal infection ranges from mild diarrhea to fulminant colitis, with rare parasitic dissemination to internal organs.(4) Sever infection reported in young infants, malnourished, low socio-economic group, and those receiving steroids.(4) Evidence indicates that cure of invasive amoebic colitis or liver Abscess confers resistant to subsequent invasive disease.(13,14) Infection with pathogenic E. Histolytica produces a marked immune response which result in the development of protective immunity.(15)

The aim of this study is to throw a light on the epidemiological features of infection with E. Histolyica among diarrheal patients in Thi-Qar children and to delineate the association of infection with risk factors, and to offer informations to health authorities to improve sanitation, intensify health education and to recommend more effective methods for prevention and control of this parasitic infection in pediatric age group.

Patients and Methods:

3600 patients presented with a cute diarrhea were included in this study done in Al-Nassiriya pediatric hospital from the beginning of January till the end of December from the year 2006. Informations about patients has been taken according to questionnaire sheet. In each case a detailed history was taken to establish the definition of a cute diarrhea ((in creased Frequency, or volume of stool out put with increased stool water content with the duration less than 2 weeks)) in addition to other historical data regarding patient's age, sex, place of residence, family size and socio-economic status, water supply, sewage disposal; type of feeding during the first 2 years and the presence of diarrheal case in the family. In all patients general stool examination was done taking in consideration the following points:

1. No anti parasitic drug was given to the patient during the 10 days prior to examination.
2. Stool specimens were fresh and collected in clean containers.
3. Stool samples were examined with in 30 minutes of collection and screened for the linear motion of trophozoites containing erythrocytes using Normal saline or stained with lugol's iodine to detect the cyst.
4. At least 3 stool specimens were examined before the diagnosis of Amoebiasis was excluded.
5. In case that the direct methods results were inconclusive and the possibility of Amoebiasis was very likely further stool samples were fixed with polyvinyalcohol (PVA) for later staining to identify the characteristic nuclear morphology of E. Histolytica ingested RBCS. Serological test that may help in the diagnosis of invasive amoebiasis were not available. other investigations like gue and urine culture, CBP, blood area, serum electrolytes were done according to the case.

Results:

It was found that the prevalence of E. Histolytica among all patients with acutediarrhea was (38.8%).

The distribution of cases according to age group is shown in table – 1. E. Histolytica affected mainly the age group of 2 moths –1 year (46.9%) and the age group of 13 months – 5 years (42.6%) with less predominant cases below 2 months and above 5 years. with regard to sex distribution of cases males percentage (51.78%) nearly comparable to that of females (48.2%) with male: female ratio was 1.07: 1 as sown in table – 2.

Regarding the monthly distribution of cases there were no significant difference from one month to the other as presented in Table – 3. Family history of acute intestinal amoebic infection was positive in 350 cases (25%).

It was found that the majority of cases were from rural areas (64.2%) as shown in table – 4. Regarding the socio-economic status the highest percentage of cases (74.85%) were in low socio-economic group while only (8.07%) were in the high socio-economic group as presented in table – 5.

The distribution of cases according to family size per home is shown in Table – 6., the highest prevalence rate f infection was among families of large size (35.71%).

It was found that the prevalence of infection was least in breast fed infants in the first 2 years of life compared with artificially and mixed fed infants as shown in table –7. With regard to the type of diarrhea a high percentage of cases (46.85%) had dysenteric diarrhea as in Table – 8., and (76.21%) of those with dysenteric diarrhea were below 2 years as shown in table – 9.

The results of stool examination all are presented in table – 10.

Table (1): The prevalence of protozoal diarrhea due to E. Histolytica according to the age group.

Age in months	No. of cases	Percentage
2 months<	44	3.14%
(2 – 12) months	657	46.9%
(13 – 24) months	280	20%
(25 – 36) months	154	11%
(37 – 48) months	84	6%
(49 – 60) months	76	5.46%
60 months>	105	7.5%
Total	**1400**	**100%**

Table (2): The prevalence of protozoal diarrhea due to E. Histolytica according to sex.

Males	No. of cases	Percentage
Males	725	51.78%
Females	675	48.2%
Total	**1400**	**100%**

Table (3): The prevalence of protozoal diarrhea due to E. Histolytica according to the months of the year.

Month of the year	No. of cases	Percentage
January	135	9.64%
February	108	7.71%
March	103	7.35%
April	120	8.57%
May	111	7.92%
June	130	9.28%
July	140	10%
August	131	9.35%
September	117	8.35%
October	105	7.5%
November	90	6.24%
December	110	7.85%
Total	**1400**	**100%**

Table (4): The prevalence of protozoal diarrhea due to E. Histolytica according to residence.

Age in months	No. of cases	Percentage
Rural area	900	64.2%
Urban area	500	35.7%
Total	**1400**	**100%**

Table (5): The prevalence of protozoal diarrhea due to E. Histolytica according to Socio-economic status.

Socio-economic status	No. of cases	Percentage
Low	1048	74.85
Middle	239	17.07
High	113	8.07
Total	**1400**	**100%**

Table (6): The prevalence of protozoal diarrhea due to E. Histolytica according to family size.

Socio-economic status	No. of cases	Percentage
1 – 4	114	8.14%
5 – 8	171	12.21%
9 – 12	219	15.64%
13 – 16	396	28.28%
16>	500	35.71
Total	**1400**	**100%**

Table (7): The prevalence of protozoal diarrhea due to E. Histolytica according to the type of Feeding in the first 2 years.

Type of Feeding	Exclusive breast feeding No. and%	Exclusive artificial feeding No. and%	Mixed feeding No. and%	Total No.
No. of patients with a cute diarrhea	574 (67.13%)	345 (40.82%)	260 (56.52%)	**1179** **(54.58%)**
No. of patients with protozoal diarrhea	281 (32.867)	500 (59.17%)	200 (43.47%)	**981** **(45.41%)**
Total	**855**	**845**	**460**	**2160**

Table (8): Type of protozoal diarrhea due to E. Histolytica

Age in months	No. of cases	Percentage
Dysenteric diarrhea	656	46.85%
Non dysenteric	744	53.14%
Total	**1400**	**100%**

Table (9): The prevalence of Dysenteric and non dysenteric diarrhea according to age group.

Age group	No. of patients with dysenteric diarrhea	No. of patients with non dysenteric diarrhea
2 years<	500 (76.21%)	481 (64.65%)
2 years >	156 (23.78%)	263 (35.34%)
Total	**656 (100%)**	**744 (100%)**

Table (10): The results of general stool examination in patients with a cute protozoal diarrhea due to E. Histolytica.

Age group	No. of patients	Percentage
E. Histolytica trophozoite	600	42.8%
Mixed cyst and trophozoite	650	46.4%
E. Histolytica cyst only	150	10.7%
Total	**656 (100%)**	**744 (100%)**

Discussion:

It was found that the prevalence of E. Histoytica among 3600 patients with a cute diarrhea was (38.8%). Many of the previous studies done on random samples of population whether they are symptomatic or not, so it's difficult to compare the results of our study with previous figures, even though the result of our study seems similar to the results of other studies done in Yousifiya (38%)[16] and in Sinniya (40.9%)[17] and more than the results reported in Najaf (9.6%)[18] and in Wasit (27.3%)[19] and in other countries like Nigeria (12.8%)[20] and Egypt (1.6%).[21] Infections with E. Histolytica affected mainly the age group of 2 month – 1 year (46.9%) and the age group of 13 months – 5 years (42.64%), with less predominant cases were seen below the age of 2 months (3.14%) and above years (7.5%). This finding is in agreement with the result of a study done in Najaf Governorate by Al-Faydawi A[22], and is also in agreement with Thompson 1994[23] Who showed a high prevalence of protozoal diarrhea in preschool children in Australia, these results may be related to unsanitary practice associated with child development (e.g playing in contaminated dirt and water, sucking on dirty Finger and other objects, etc.). Their less mature immune system, especially in those < 6 years, can reduce their ability to mount strong immune defence to infectious agents. With regard to sex this study showed No difference in prevalence of infection between males and females, this is in agreement with Najaf study[22] and Baghdad study[16], and its not in agreement with Kadir *et al.*[24] Who showed that protozoal infection was higher in females than males, and is not similar to the result of another study done by Naki[25] in Al-Tooz who found that the prevalence was higher in males than females. In 25% of cases there was other family member with a cute

protozoal diarrhea due to E.Histolytica, this reflects that the disease can be easly transmitted to other family member by person to person contact.

With regard to the monthly distribution of cases there were no significant differences from one month to the other, and this reflects that the disease is endemic through out the year, the lator results are different from the result of a study done in Diwani which revealed high prevalence of infection with E. Histolytica during summer time (from) June to September.(26) With this respect HAQUE, R. in BENGLADESH showed that, E.Histoytica–associated diarrhea didn't show relation with season.(27)

The majority of cases were from rural areas (64.2%) and this could be attributed to many factors like poorly constructed houses, poor Hygienic conditions, the use of water directly from the rivers for drinking with out treatment and the use of human feces as fertilizer by many farmers, the presence of (housefly) in doors that may carry cysts on it's feet and pass large number in its feces and vomitus.(28)

The above results are inconsistent with the result of a study done in Sammarra district that showed no variation in the prevalence of infection between rural and urban population(29)' and it's in agreement with result of Kadir and Salman study in Al-Tameem province that showed a high prevalence of infection in rural than urban areas.(30) With regard to socio-economic status the highest percentage of causes (74.85%) where seen in low socio-economic group, this is in agreement with Baghdad study(16), and also in agreement with a study done by Al-Batate in Suq Al-Shyoukh.(31) With regard to family size the study showed the highest prevalence rate of infection was among the family of large size per home and this could be due to transmission by direct personal contact with in the same family due to over crowding, poor Hygienic conditions, this result is consistent with finding of Al-Batate study(31), and is in agreement with the result of another study done by Abdul Ridha H.(32) In Nassirriya Governorate. With this respect Senek J *et al* 1939 found that the aggregation of infected person does more to the spread of Entamoeba infection than sanitation.(33)

With regard to the type of feeding in the first 2 years of life the prevalence of infection with E. Histolytica was the least in totally breast feed infants when compared with artificially fed infants and those on mixed type of feeding, and this May be related to anti-infective and anti-inflamatory properties of human breast Milk.(34,35)

The above result are inconsistent with Samarra study(29) which revealed no relation to the type of feeding with the prevalence of infection. with this respect Akisu C found that breast fed children have a lower rate of amebiasis than non breast fed infants.(36) With regard to they type of protozoal diarrhea a high percentage of cases (46.85%) had dysenteric diarrhea on presentation ((as defined by the presence of gross blood in the stool and / or microscopic stool examination showing Red Blood cells > 1 / HPF.).(27)

With (76.21%) of those with dysenteric diarrhea were below 2 years, this reflect that younger age group are more liable to invasive amvebiasis due to immature Immune system and to the lack of previous exposure to amoebic infection.

The result of stool examination reflects the good experience of Laboratory workers in an endemic area and that stool microscopy due to its low cost and good capacity for detecting different parasitic protozoa will continue to play an essential role in supporting the physicians in the diagnosis of intestinal parasitism. from this study we concluded that:

- Amebiasis is endemic in Thi-Qar Governorate.
- Protozoal diarrhea due to E. Histolytica affects mainly the age group below 5 years.
- Poverty and poor sanitation are the most important factors behind the spread and persistent of infection.

Thus we recommend to concentrate on two levels:

1. The community level through the improvement of environmental sanitation including water supply, adequate disposal of Faeces, food safety and health education to prevent faecal-oral transmission.
2. The individual, through early detection and treatment in cases of infection and disease and through good personal hygiene.

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