

**SURVEILLANCE OF SCHOOL CHILDREN
PREVALENCE OF INFECTIOUS PARASITES IN
BEACH CAMP AT GAZA , PALESTINE.**

By

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ABSTRACT

A health impact study was requested and carried out by The Environment Protection and Research Institute (EPRI) in collaboration with United Nations Relief and Work Agency (UNRWA). The 1st phase of the Health Impact study started 1994 by identifying the optimum sample size of kindergartens and school children for infectious parasite analysis, sites to measure the fly index, the rat index, and the water samples for microbial examination. Besides, training of the staff who are contacting the concerned personell in the community; kindergartens; and Schools was carried out. After the end of the second phase of the study in August 1999, the data revealed that the prevalence of Ascariasis and other intestinal parasites was 36.5 for both kindergarten and 1st elementary class children.

The parasitic infections in girls was 36.3 and in boys was 35.3. *Giardia lamblia* and Ascarid were the more abundant parasite 41-42% respectively followed by *Entameba histolytica*, *Trichuris trichuris* and *Strongiloidis stercorals* (12%, 4%, 1%) respectively.

The average number of flies per m² / minute (fly index) was 27. The average number of rats captured per day per house (Rat index) was

one Rat / day/ house. All the water samples examined for *E. coli* index were negative. The number of diarrheal cases (0-3 years) per week were 15 cases. The number of Dysentery cases per week was 2-8 cases.

Health education campaign was launched by the EPRI in cooperation with UNRWA, Health Dept. and the local community. This effort together with the encouragement of upgrading sanitation conditions was reflected in the position improvement of sanitary conditions in the Beach camp during the second phase (1999) of this study compared to the base line in 1994.

INTRODUCTION

About 22% of the Gaza-city population reside overcrowded in the Beach camp of refugees on a surface area of 0.75 km² (United Nations Relief and Work Agency) (UNRWA) 1996. It was estimated that 50% of the total population in the Gaza Strip are children under 14 years old (Palestinian Central Bureau of statistics; 1997). The parasitic infection is considered one of the major health problems. Intestinal parasites are considered one of the high mortality factors causing malnutrition and anemia among children in the Gaza Strip. The low standard of living prevailing in Gaza Strip is due mainly to the lack of sanitary services and spread of unemployment (Abu Hashish 1995 and Human Development Report 1997).

The present investigation started in 1994 in its first phase followed by the second phase in 1998/1999 and was devoted to evaluate the prevalence of infectious parasites in school children in the inhabitants of the Beach Camp in Gaza Strip.

The sewage disposal system especially in refugee camps is not properly engineered. More than 50% of the pre-school children in the Gaza Strip refugee camps are infected with intestinal parasites due to the

poor environmental sanitation conditions in addition to lack of personal hygienic practices (UNRWA, 1993).

The prevalence of intestinal parasites as a result of low socioeconomic standard and lack of public sanitation conditions (Ahmed, 1991; Coskun, 1991; Mejias, 1993; Nimri, 1994; Al-Eissa *et al.*, 1995 and Gamboa *et al.*, 1998).

In a recent report, it has been found that *G.lamblia* is the most common parasite among the Palestinian refugee school children (UNRWA, 1996). In a cross sectional study, Al-Wahaidi (1997) reported that *G.lamblia* is the most frequent species found among the pre-school Palestinian children.

Recently Yasin *et al.*, (1999) reported a study dealing with the prevalence of intestinal parasites among school children in Gaza City, Gaza Strip. They examined 489 specimens from school children aging 6-11 years. An overall prevalence of parasitic infection was 27.6%. Six parasites were detected where *Giardia lamblia* was (62.2%), followed by *Ascaris iumbricoides* (20.1%) and then *Entumeba histolitica* (13.3%) in a descending order.

MATERIALS AND METHODS

1- School, Kindergartens and Sample Size:

The same schools and kindergartens, which were included in the 1st phase of the study were identified and used for the 2nd phase of the study. Classes and pupils were selected randomly.

The total number of pupils from kindergartens and school were 294 and 277 respectively. The average rates of the 1st and 2nd response were 75.5% and 67.5% respectively.

2- Stool Analysis:

A: The wet mount of fresh stool in (saline) technique.

The samples were screened microscopically using 10x10 eyepiece lens and 40x10 objective lens for detection of helminthes, eggs, larvae and cysts.

B: Direct wet mount of fresh stool in iodine material for D'anton: iodine technique.

Purpose: To confirm detection of Entameabia, Giardia and other cysts in stool

3- Water Analysis

Bacterial Analysis of water to detect E. Coli or Coliform microorganism was implemented by Millipore Filter membrane Technique. 20 water samples were collected successively at June and August 1998, using aseptic collection technique. These 20 samples were collected from 10 different houses at Beach camp.

Result Interpretation:

- 1- No. growth.
- 2- ≥ 8 -10 colonies = No. significant growth.
- 3- More than 10 colonies = significant growth or water contamination.

4- Fly, Rat & E. Coli Indexes & Prevalence of Diarrheal and Dysentery Diseases in Beach Camp:

The same procedures used in the 1st phase of the study was used in the 2nd phase of the study to measure the fly index, rat index, and E. coli index, and prevalence of Diarrheal and Dysentery diseases in Beach camp.

RESULTS AND DISCUSSION

1- Prevalence of Parasitic Diseases in Beach Camp.

Table 1 shows that the prevalence of parasite infection in the 1st day of response was 35.69% while Table 2 shows that the prevalence of parasitic infection in the 2nd day of response was 37.5. Table 3 shows that

the prevalence of parasitic infection among boys and girls is 35.3% and 36.3% respectively.

Table (1): Prevalence of parasitic infection among the pupils (1st day of response)

Total Number Of Cases	Positive	%
419	150	35.69

Table (2) : Prevalence of parasitic infection among the pupils (2nd day of response)

Total Number of Cases	Positive	%
400	150	37.5

Table(3): Prevalence of parasitic infection by sex

Sex	Number of Cases	Positive	%
Boys	218	77	35.3
Girls	210	73	36.3

Table 4 shows that the prevalence of parasitic infection for *G.lamblia*, *Ascaris*, *E. hostolytica* *T. trichuris*, and *S.sterocorals* are 17,16,2.8, and 0.5 respectively. Table 5 shows that the percentage of positive case of

Giardia lamblia, *Ascaris*, *Entameabia hostiylotica*, *Trichuris trichuris* and *Strongyloidis sterocarlis* are, 42, 41, 12, 4 and one respectively. Table 6 shows that 84% of pupils were infected by one type of parasites and 15% and 1% were infected by two and three types of parasites respectively.

Table (4) : Prevalence of parasitic infection by type of parasite

Type of parasite	No.of cases examined	Positive cases	Prevalence %
<i>Giardia lamblia</i>	419	75	17.90
<i>Ascaris</i>	419	72	17.18
<i>Entameabia hostolytica</i>	419	21	5.01
<i>Trichuris trichuris</i>	419	7	1.67
<i>Strongyloides sterocolals</i>	419	2	0.47

Table (5): Number of parasites by patients.

Number of Parasite	Number of Cases	%
One Type of Parasites	126	84
2 Type of Parasites	22	15
3 Type of Parasites	2	1
Total	150	100

-Comparison of the 1st phase (March, 1994) and the 2nd phase (August, 1999) of the study results.

Table 6 shows that there were marked decrease and drop in the parasitic infection, prevalence of Diarrheal and Dysentery cases, Ascaris eggs in the soil, *E. Coli* index and rat index while fly index dose not change.

Table (6): Comparison of the findings of the two phases of the study results.

No	Findings	First phase March, 1994	Second phase August, 1999
1-	Prevalence of Parasites	58.7	36.5
2-	Prevalence of Ascaris	57.6	16
3-	Prevalence Giardiasis	29	17
4-	Prevalence of Amebiasis	4.7	2.8
5-	No. of Ascaris eggs in the soil	10	3.3
6-	Fly index	27	27
7-	Rat index	2.2	1
8-	<i>E. coli</i> index	25% were (+)	All samples (-)
9-	Number of Diarrheal disease (0-3 years per week.	56	15
10-	Number of Dysentery cases per week.	19	2.8

The increased rate of parasitic infections proved to be higher in children where they have access to be infected while playing in water and soil where they can easily get the infections. The early infant infection has an adverse health effect on growth and cause mental disorders and anemia. This trend is in agreement with Kaspari and Condie 1986, Ish

Horowicz *et al.*, and Al-Wahoidi (1997); Sullivan *et al.*, 1988; Nimri, 1994; and Fraser *et al.*, 1997.

SUMMARY

In general we can conclude the following from the findings of the 2nd phase results:-

- 1- The prevalence of Ascariasis and other parasites was 36.5 for both kindergarten and 1st elementary class.
- 2- The prevalence of parasitic infection among boys (males) was 35.3 and among girls (females) is 36.3.
- 3- *Giardia lamblia* and *Ascaris* were the most common parasites 42% and 41% respectively followed by *Entameaba histolytica*, *Trichuris trichris* and *Strongyloidis stercorals*, 12%, 4% and 1% respectively.
- 4- The average number of *Ascaris* eggs in the soil was eggs/100 gram (soil).
- 5- The average number of flies per square meter per minute (fly index) was 27.
- 6- The average number of rats captured per day per house (Rat index) was one Rat/day/house.
- 7- All the water samples examined for *E. coli* index were negative
- 8- The number of Diarrheal cases (0-3 years) per week was cases.
- 9- The number of Dysentery cases per week was 2.8 cases.

Infected cases were treated at their kindergarten and schools by anti-parasite medication in co-ordination and co-operation with UNRWA Health and Education Departments and Local Community. Also, health education campaign was Launched by the Environmental Protection and Research Institute (EPRI) with co-ordination with UNRWA Health Department and Local Community. Leaflets were distributed and lectures were given to inhabitants in respect of personal hygiene cleanliness in general, water supply, dry waste disposal, sewage disposal and filthy diseases (prevention and control).

The study confirmed that the investment in the infrastructure (water supply, dry waste disposal and sewage and storm water disposal) could be reflected positively on the health conditions of inhabitants. The study showed that by improvement of sanitary conditions in Beach Camp resulted in decrease and drop of rat and *E. Coli* indexes. Also there was a drop in the number of Diarrheal and Dysentery cases reported to health centers. The Beach camp project was very successful one regarding its impact on the health of refugees. Therefore, we do recommend to expand such projects in the other refugee Camps in Gaza Strip or any places which are suffering from bad environmental conditions.

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الملخص العربي

دراسة مدى انتشار الطفيليات المعوية في اطفال المدارس من "معسكرات الشاطئ" للاجئين بمدينة غزة بفلسطين

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اجريت هذه الدراسة بالتعاون بين معهد ابحاث وحماية البيئة التابع لجامعة الازهر بمدينة غزة مع وكالة الامم المتحدة لرعاية وتشغيل اللاجئين بفلسطين على مرحلتين بدأت اولهما في ١٩٩٤ وانتهت الرحلة الثانية في ١٩٩٩. وقد تم اختيار تلاميذ المدارس في مرحلتى الروضة والسنة الاولى الابتدائية وتم اختيار المواقع واعداد العينات التى ستدرس. وقد كانت ميدان الاسكارس اكثر الطفيليات انتشارا بنسبة ٣٦.٥% وكانت نسبة انتشار الطفيليات فى الاثاث ٣٦.٣% وبين الاولاد ٣٥.٣%. وقد تبين ان طفيلي الجارديا والاسكارس اكثر الطفيليات انتشارا ٤٢.٤١% على التوالى.

كما قد تبين ان معدل انتشار الذباب ٢٧ ذبابة /م^٢/الدقيقة. كما تبين ان البكتريا من نوع *E. Coli* غير موجودة بتركيز نخشى منه فى عينات المياه التى تم فحصها.

كما تبين ان حالات الاسهال متوسطها ١٥ حالة / للاسبوع بين الاطفال اعمار ١-٣ سنوات. كما كانت حالات الدوسنتاريا حوالى ٢٢ حالى / اسبوع.

وقد بدأت حملة التوعية للتعليم الصحى والتوعية بواسطة فريق الباحثين من معهد ابحاث وحماية البيئة بالتعاون من برنامج الامم المتحدة لرعاية وتشغيل اللاجئين وكاننا لحملة

التوعية والتي بدأت عام ١٩٩٥ عقب المرحلة الاولى للدراسة تأثيرات ايجابية فى رفع مستوى السلوك الصحى بين الاطفال ونويعهم - مما ادى الى تقليل معدلات الاصابة بالطفيليات بين الاطفال.