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Infectious diseases in a Nicaraguan refugee camp in Costa Rica

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SUMMARY

Some Nicaraguans living in Costa Rica are in refugee camps. The types and rates of infectious diseases in the Pueblo Nuevo refugee camp were measured by examining medical records for 1985 and performing stool and blood testing. The incidence of infections was 320 episodes per 1000 persons per year. Respiratory infections represented 63% of all illnesses and pulmonary tuberculosis was high. Malaria was not found in blood samples and no childhood illnesses preventable by immunizations were recorded in the records. Intestinal parasites were found in 56% of the persons examined, considerably higher than the 15% prevalence noted in surveys of Costa Rica as a whole. *Trichuris trichiura* was found in 40% of the positive stool samples. The deficient hygienic conditions and overcrowding in the camp are responsible for the high rates of infections and the continued presence of infections many of which probably were acquired in Nicaragua. Improvement of hygienic conditions can be accomplished by involving the refugees in education, cleaning and identifying problem areas. Adequate sanitation and improved water supply, and reducing overcrowding are also recommended.



Figure 1. Map of Nicaragua and Costa Rica showing locations of refugee camps. (From *Refugee Magazine*, 20, August 1985)

INTRODUCTION

Costa Rica always had a considerable influx of Nicaraguans, predominantly poor. Since late 1984 the flow of refugees has been exacerbated with the intervention of the war. As of June 1985, there were 3000 new arrivals in refugee camps and a total of 9200 Nicaraguans living in different parts of Costa Rica¹. There are 6 refugee camps in Costa Rica all assisted by the United Nations High Commissioner for Refugees (UNHCR) (Figure 1). Tilaran and Pueblo Nuevo in the North and East of Costa Rica respectively, are the oldest camps, and many of their inhabitants have lived there for 2 years or more.

Each camp has more than 1000 persons. While Costa Rica has been praised for the higher standard of its camps, as compared to other countries, refugees live in overcrowded conditions, lack adequate sanitation and safe water, and experience high rates of infectious diseases². This is indicated by a recent study in Tilaran² which showed that 67% of children less than 7 years old had evidence of

parasites, while in Costa Rica as a whole the rate is less than 15%³. The estimated rate for Nicaragua during that same time period was much more⁴.

This study was conducted in January 1986, at Pueblo Nuevo camp 3 kilometers from the Port of Limon. The purpose of this study was to estimate rates of selected infectious diseases.

BACKGROUND

The camp, which opened in May 1983, had 1160 persons in June 1985⁵. The population consisted of Nicaraguans, 45% of whom are of African descent (from the West Indies), 40% Miskito, 14% Mestizo and 1% Rama⁵. By January 1986, the camp records showed 125 families with 650 persons and 100 single men not associated with families (a total of 750 persons). The people lived in either cement or wooden barracks, with 20-40 families per barrack and as many as 5 people living in an approximately 2x4 m space. Cardboard walls separate the families. Most latrines and showers are located outside and as many as 10-26 people may share one latrine and shower⁵. The latrines are often soiled. Running water is from the Port of Limon; several sinks with running tapwater are located outside each barrack and one main tap is located in the centre of the camp. Often the water pressure is too weak to reach the taps. Food from one distribution centre located in the camp, is cooked on electric burners within the barracks. The people appear to have enough clothes, but often are barefoot. Refuse collection is twice a week by the Port of Limon. The camp is fumigated four times a year.

There is a health post in the camp staffed by one part-time medical practitioner and one full-time volunteer nurse (a refugee). The physician works 5 days a week in the camp for 3-4 hours each day, examining approximately 5-15 patients a day. The Health Post functions as a clinic for curative services. Prevention include immunizations and malaria case-finding for all new refugees⁵. Gynecological exams are not performed regularly. Stool examinations for parasites are not usually done. Suspected cases of intestinal parasitism were treated with oral mebendazole.

The administration of the camp, in the hands of 'Socorro International', a religious organization, was transferred to 'Centro de Analisis Sociopolitico para Refugiados' (CASPRE). This new non-religious organization is supported by UNHCR.

METHODS

Impressions of the camp conditions were recorded, based on 6 days of observations in January 1986. All homes and barracks were briefly visited the first day of the investigation. Subsequently the living quarters of each participant in the stool survey, was visited by the principal investigator Dr Diaz. Informal oral interviews were conducted by this investigator during the daytime. The participants were asked several questions including; how many people occupied each living quarter, how was food obtained and prepared, where did each member of the household wash themselves and their clothes and where did each participant evacuate? The 1985 camp physician's report and all health records kept by the doctor for the year 1985, were reviewed; only one physician worked in the camp during 1985. Annual incidences (number of new cases per 1000 persons per year) of selected infectious diseases were estimated by using the midyear population of 1160 persons.

The administration at the camp had a list of the 125 families residing in the camp. The average family size was 5 people. For this study all families in the camp were numbered and 25 families (20% of the families) were picked at random for blood and stool testing. All 25 families agreed to participate in the study but approximately 15% of the people, mostly adult males, failed to attend. Stool samples were collected from 117 persons, 85% of the sample. Participants were instructed to collect a morning stool in a plastic container which was supplied. Blood samples were drawn from 87 people, 70% of the sample; 20 people refused.

Faeces were rapidly smeared onto glass slides, fixed in methanol for 5 min and stained with Giemsa for 30 min. Faeces were suspended in polyvinyl alcohol Schaudinn (PVA) fixative. PVA preserved stools were directly examined in normal saline and Lugol's iodine. At least 50 fields were examined by the director of the microbiology laboratory at INISA. No stool concentration techniques were used.

The 36 blood samples in persons over 15 years of age, collected for VDRL testing, were sent to the Ministry of Health. Eighty-seven malaria thin smear slides were fixed for 5 minutes in methanol, stained with Giemsa for 30 min and examined under an oil immersion lens (x1000).

RESULTS

Medical record review

Based on the medical records, rates of infectious disease were calculated. The most common infections were respiratory, an estimated incidence rate of 200 respiratory episodes per 1000 persons per year (Table 1). Lower respiratory infections (LRI) were most common. Most (68%) of upper respiratory infections (URI) occurred in children less than 10 years of age (Table 2). Pulmonary tuberculosis, diagnosed by acid fast staining, occurred in 4 cases per 1000 persons per year.

The second commonest group of infectious diseases included skin and mucosal infections, with an incidence rate of 70 episodes per 1000 persons per year (Table 1), half of which were pyodermitis (cellulitis, infectious impetigo and erysipelas) and 27% were cutaneous leishmaniasis.

Gastrointestinal (GI) infections included anorexia, abdominal pain or diarrhoea diagnosed clinically as gastroenteritis or intestinal parasites (without examination of stools). The incidence of GI infections was 55 per 1000 persons per year. Sixty per cent of GI infections were recorded as suspected parasitosis. Diarrhoea represented 38% of GI symptoms and was recorded mostly in children (80%) less than 1 year of age.

The incidence rate of genitourinary infections was 28 episodes per 1000 persons per year (Table 1). Urinary tract infections (UTI) were the commonest (69%) with 91% in women, all of whom were older than 15 years, 21.9% were urethritis, mostly in men over 15 years. It was not known whether the urethritis was gonococcal or non-gonococcal. Pelvic inflammatory disease was diagnosed in 2 women.

Stool survey

In 117 stools collected, 56% had one or more parasites. *Trichuris trichiura* was the commonest (40% frequency), *Giardia lamblia* was second most common (23% frequency) and hookworm the third (15% frequency). One quarter of the stools collected had 2 or 3 parasites. Only 3 cases with *Ascaris lumbricoides* were observed, all in the same family. *Cryptosporidium* was found in two infant girls. The prevalence of intestinal parasites by age was similar to the prevalence of the entire sample, with the exception of the low rate (25%) in children less than 1 year old.

VDRL and malaria testing

Two samples were positive with low titers (1:1 and 1:2) and FTA-Abs tests confirmed syphilis in both.

Table 1. Infectious disease, by system involved, Nicaraguans in Pueblo Nuevo refugee camp, Costa Rica, 1985

Group	Number of cases (%)	Incidence per 1000 persons
Respiratory ^a	233(62.8)	200
Skin and mucosal ^b	81(19.8)	70
Gastroenteritis, intestinal parasites, diarrhoea	64(15.6)	55
Urinary tract infection, urethritis, pelvic inflammatory disease, candidiasis	32(7.8)	28
Total	410(100.0)	353

^aSee Table 2.

^bIncludes cellulitis, infectious impetigo, erysipelas, conjunctivitis, varicella, leishmaniasis and scabies.

Table 2. Respiratory infections among Nicaraguan refugees, 1985

Type	Number of cases (%)	Incidence per 1000 persons
Lower respiratory illness ^a	100(42.9)	86
Upper respiratory illness	83(36.5)	73
Otitis media	18(7.7)	16
Otitis externa	10(4.3)	9
Tonsillitis	7(3.0)	6
Pulmonary tuberculosis ^b	5(2.1)	4
Sinusitis	5(2.1)	4
Pharyngitis	3(1.3)	2
Total	233(100.0)	200

^aIncludes tracheobronchitis, bronchitis, trachitis, bronchiolitis, pneumonia, laryngotracheobronchitis.

^bDiagnosis was made in sputum by acid fast staining.

Both individuals were women and one was pregnant. No cases of malaria were diagnosed.

DISCUSSION

There were several limitations to this study. The clinical retrospective analysis based on the medical records represent a biased population. People who are less ill and workers may be underrepresented while children and women may be overrepresented. There was only one physician working at the camp and all the diagnoses were based on his clinical suspicions usually without laboratory tests. The stool survey was a randomly selected population based study but single men

were not included. It was felt they were more transitory and did not represent the stable refugee population. Also preserved stool samples were used and no concentrating techniques were applied so the actual rate of intestinal parasites may be higher.

Rates of intestinal parasites in the refugee camp and the high prevalence of *Trichuris trichiura* were similar to those of Nicaraguans surveyed in Nicaragua and in the USA^{4,6,7}. Costa Ricans have less than a 15% rate of parasitic infections^{7,8}. Many cases of intestinal parasitism may have been originally acquired in Nicaragua but given the marginal hygienic conditions in this refugee camp, particularly related to disposal of faecal waste, the high prevalence of intestinal parasitism is not surprising. Overcrowding is likely to be responsible for the spread of many infectious diseases in the camp, particularly of tuberculosis and other respiratory infections^{9,10}. The prevalence of lower respiratory infections suggest either a sicker community, selection bias or both. Lack of malaria identification seems to indicate good control of the disease, though it should be noted only thin smears were done. No reports of childhood diseases preventable by immunization were found reflecting either an adequate immunization programme or lack of transmission since these diseases are eradicated (polio) or rare in Costa Rica⁸.

Certain preventive measures must be taken to improve the health of the refugee community and curtail the spread of infections within the community. First the problem areas in the camp must be identified¹¹. For instance, in this camp, refugees were using the central faucet meant for drinking and cooking water alone, to wash themselves thus contaminating the water. Many people were barefoot, latrines were soiled often with stool and urine on the floor, no water was available many hours each day and most refugees did nothing all day. Once the problems are identified many solutions are available. The refugees themselves should be involved in figuring out solutions as well as being responsible for their implementation. This could be done via self education, cleaning, identifying problem areas and practising good hygiene. For example all new refugees should have stool examinations as well as refugees who have not

had stool examinations previously. Refugees could assist with collection and encourage cooperation. Subsequently appropriate therapy could be given to those infected with parasites. A group of trained volunteers could provide education on hygiene. This should emphasize hand washing, wearing shoes, proper food hygiene and appropriate use of the latrines and water supply facilities. The camp administration should add a holding tank for water to ensure the presence of running water will be at all times. Though not done in this study, the water supply should be tested for parasites (i.e. giardia) and bacteria to locate the source of some infections and prevent their spread. Finally overcrowding should be reduced. Proper preventive measures will insure a healthier refugee community and maintain the health standards of the surrounding community.

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