Health Problems among Indochinese Refugees

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Abstract: The results of medical evaluations of 194 recent Indochinese refugees are reported. In addition to confirming findings of other studies of these refugees, we found a significant prevalence of abnormalities, i.e., hematological (37 per cent), dermatological (26 per cent), psychiatric (10 per cent of adults), and thyroid (5 per cent). Guidelines and recommendations of physicians providing medical care for Indochinese refugees are presented. (*Am J Public Health* 1980; 70:1003-1006.)

Introduction

At least 250,000 Indochinese refugees have immigrated to the United States since 1975. The planning and delivery of medical care to this expanding patient population is a concern for U.S. physicians.[1], [2] To date, the medical literature on the health of earlier Indochinese refugees has been limited in scope.[3-11] Among recent Indochinese refugees, the prevalence of certain infectious diseases (tuberculosis, leprosy, veneral disease, hepatitis A and B, malaria, intestinal parasitism) has been well documented.[12-17] The present report presents data from comprehensive evaluations of the health status of the most recent Indochinese immigrants.

Methods

Between June 26, 1979 and January 15, 1980, 194 Indochinese refugees were seen at the University of Connecticut Burgdorf Clinic in Hartford, Connecticut. Cooperation with local sponsoring agencies and Indochinese Social Services permitted screening of all newly arrived refugees to the Hartford area, as well as assessment of many of those refugees who had already settled in the area. Most patients were seen within several weeks of arrival in the U. S.

Both pediatric and adult patients were evaluated and initial history and physical examination made either by a staff pediatrician or internist. When a language problem existed (one of the internists is Vietnamese), an appropriate translator was available. Initial investigations for children included CBC, urinalysis, stool specimen for ova and parasite, and tine test. For adolescents and adults, a urinalysis, stool specimen for ova and parasites, 1st strength PPD and/or PA chest x-ray, VDRL, and SMA 12* were obtained. An HbSAg determination was added in December. All patients received immunizations as recommended by the Center for Disease Control.[12]

Results

During the study period, the 194 patients made a total of 433 visits to the clinic. Table 1 provides demographic details of the group examined. Forty-seven per cent of patients were seen for one visit only, because the initial screening was normal, the refugee resettled to another area, or further needed medical care was provided at another facility.**

Thirty-seven per cent of those complete blood counts done were significantly abnormal. Twenty-two per cent of patients tested had an eosinophilia of 10 per cent or more (another 25 per cent had a 4-9 per cent eosinophils); 29 per cent had microcytic red blood cells (MCV < 81 for males, < 80 for females); 16 per cent had definite anemia (Hgb < 13 gm per cent for males, < 11 gm per cent for females).

Eleven of the 30 anemic patients had either a probable or documented iron deficiency.*** In three patients, anemia was secondary to the chronic disease, and nine patients had hemoglobin disorders. In seven patients, the etiology was undetermined.

Two significant hemoglobin disorders were present: thalassemia minor with hemoglobin A_2 levels greater than 3.5 per cent and the presence of hemoglobin E either in homozygous or heterozygous pattern. These disorders accounted for at least 34 per cent of the microcytosis seen. Thalassemia minor was documented in seven patients from six families and might well have been present in others.

The hematological abnormalities and electrophoretic patterns of patients with hemoglobin E are described in Table 2. The last five represent one family, while the other three represent three families. Hemoglobin E has been reported to have a prevalence of 20 per cent in Thailand[18] and

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*BUN, glucose, calcium, inorganic phosphorus, SGOT, LDH, alkaline phosphatase, total bilirubin and uric acid.

**The latter two reasons explain the incompleteness of some of the abnormal laboratory data.

***A probable iron deficiency was based on a decreased serum iron, an apparent etiology for blood loss and/or a response to empiric iron therapy. A documented iron deficiency was diagnosed if the serum iron and/or ferritin were decreased, and iron binding capacity was increased.

TABLE 1—Age, Sex and Nationality of Refugee Study Population

Age (years)	Sex		Nationality		
	Female	Male	Cambodian	Laotian	Vietnamese
0–9	18	19	2	16	19
10–19	24	37	2	21	36
20–29	18	19	5	7	25
30–39	14	6	—	7	13
40–49	9	12	1	7	12
50–59	5	5	1	3	6
60–69	2	2	1	2	1
70–79	4	—	1	—	3
TOTALS*	94 (48)	100 (52)	13 (7)	63 (32)	118 (61)

*Percentages are given in parentheses

TABLE 2—Refugee Patients with Hemoglobin E

Age	Sex	Nationality	Hgb A %	Hbg E %	MCV	Hgb
28	F	Cambodian	68.8	31.2	75	12.4
21	M	Vietnamese	70.8	29.2	77	14.1
20	F	Vietnamese	65.0	35.0	72	11.1
30	F	Laotian	—	100	73	10.7
41	M	Laotian	64.2	35.8	77	14.4
5	M	Laotian	—	100	64	11.2
15	F	Laotian	75	25	71	11.6
13	M	Laotian	77.7	22.3	67	10.9
8	F	Laotian	—	100	74	10.7

35 per cent in Cambodia,[19, 20] but its prevalence among Vietnamese and Laotians has not been reported.‡

Stool specimens obtained from 138 patients (77 per cent) showed 65 per cent to be infested with one or more parasites. Unusual parasites found included Paragomonimus Westermanii and Schistosomiasis Japonicum (Table 3).

Tuberculin testing results were comparable to those reported by others,[2, 8, 22] with 33 per cent under age 19 positive (> 10mm induration by either tine or PPD), and 62 per cent positive, ages 19 and over. One active case of tuberculosis already under treatment was detected.

Table 4 lists the patients in whom thyroid disease was documented. Six patients were found to have clinically euthyroid goiters. Four of these had increased iodine uptake on thyroid scan, suggesting iodine deficiency as the most likely etiology of the goiter.

Forty-eight patients had abnormalities of their SMA-12 chemistry profile, 35 of them showing elevated gamma globulin. Other abnormalities included mild elevations of alkaline phosphatase (five patients), decreased serum albumin (three patients). Routine urinalysis revealed microscopic hematuria in five patients which resolved on follow-up. Prevalence of HbSAg was 20 per cent.

A number of other medical conditions were detected by history and/or physical examination. The most important findings include the following:

- Superficial skin infections (tinea versicolor, other mycosis, scabies and pediculosis) were found in 29 (15 per cent) of patients examined.
- Five patients (three from one family) have been found to have hyperamylasemia of undetermined origin.
- Five patients gave a history of malaria and three patients developed active (Plasmodia Vivax) disease.
- There were 10 adult patients with significant psychiatric problems, an adult prevalence rate of 10 per cent. Problems included depression (one patient required hospital-

TABLE 3—Prevalence and Type of Intestinal Parasitism among Refugee Study Group

Organisms identified	Age Groups				
	0–19	20–39	40–79	Total	%
Helminths					
Ascaris lumbricoides	17	10	6	33	21
Clonorchus sinensis	7	6	1	14	9
Hookworm	11	13	8	32	21
Paragomonimus westermanii	1	0	0	1	1
Schistosomiasis japonicum	2	2	0	4	3
Strongyloides species	1	2	1	4	3
Trichuris trichuria	13	3	0	16	10
Protozoans					
Endolimax nana*	4	8	6	18	12
Entameba coli*	5	0	5	10	7
Giardia lamblia	9	5	0	14	9
Iodameba butschlii*	0	3	2	5	3
Isospora hominis*	1	1	1	3	2

*Non-pathogens

‡The presence of hemoglobin E has clinical significance because of its association with mild anemia, microcytosis, and targeting of red cells. The combination of hemoglobin E with beta thalassemia can produce a severe hematologic disorder.[20, 21]

TABLE 4—Refugee Patients with Thyroid Disease

Age	Sex	Nationality	Thyroid Function Tests	Thyroid Scan
30	F	Vietnamese	Normal (Goiter)	Increased uptake
50	F	Laotian	Normal (Goiter)	Multiple adenomatous goiter
16	F	Vietnamese	Normal (Goiter)	Increased uptake
45	F	Vietnamese	Normal (Goiter)	Increased uptake cold nodule
61	F	Laotian	Increased T-4, FTI	Multinodular goiter
31	F	Vietnamese	Decreased T-4 Increased TSH (History I-131 RX)	Not done
49	F	Laotian	Normal (Goiter)	Increased uptake
50	M	Vietnamese	Normal	History of Graves Disease
31	F	Laotian	Normal (Goiter)	Pending

ization), tension headaches, severe anxiety, and two cases of active psychosis requiring hospitalization.

• Dental caries and/or poor dentition were so prevalent they were not precisely quantitated. At least 75 per cent of patients examined required extensive dental care.

• Otorhinological problems (otitis media, deafness, chronic sinusitis) were found in 8 per cent of the population, and opthalmological problems (cataract, conjunctivitis) in 6 per cent.

Discussion

We found the prevalence of certain infectious diseases, i.e., tuberculosis, intestinal parasitism, skin infections, malaria, and HbSAg carrier state, to be similar to that of previous reports. However, we also found an impressive number of cases of anemia, hemoglobin disorders (A_2 and E), thyroid disease (especially goiter), hyperamylasemia, and psychiatric disorders. These have not been reported previously in a systematic way.

We suggest the following guidelines for physicians providing medical care for the Indochinese refugees:

• The basic medical evaluation should include a complete history and physical examination, CBC, stool examination for ova and parasites, tuberculin skin testing, and/or PA chest x-ray and HbSAg determination.

• Physicians should expect to encounter hematological disorders, especially eosinophilia, anemia, and microcytosis. As there is significant prevalance of abnormal hemoglobins among this patient population, a hemoglobin electrophoresis should be done on any patient with microcytosis and/or anemia.

• Thyroid disease, with euthyroid goiters in particular, are prevalent in the adult population. This is most likely the result of iodine deficiency.

• Infectious diseases are common, including not only tuberculosis and intestinal parasitism but skin infections, otitis media, conjunctivitis, and malaria.

• Psychiatric problems might well become a major health problem. In the present study, 10 per cent of adults had significant psychiatric problems. The problems were apparent within the context of limited follow-up evaluations. As these refugees resettle in the U.S. and/or are further evaluated, psychiatric disorders may become even more apparent.

REFERENCES

1. Aduan RP, McCutcheon M: Refugees from Indochina. Annals of Internal Medicine 1980; 92:266.
2. Health Screening of Resettled Indochinese Refugees: Washington, DC, Utah. MMWR 1980; 29:4-11.
3. Hodson EM, Springthorpe BJ: Medical problems in refugee children evacuated from South Vietnam. The Medical Journal of Australia 1976; 2:747-749.
4. Swender PT, Sandler AP: Vietnamese and Cambodian orphans 1975 - the first look. Clinical Pediatrics 1977; 16:264-269.
5. Update on Vietnamese Refugee Health Status. MMWR 1975; 24:267-268.
6. Hansen's Disease in Vietnamese Refugees. MMWR 1975; 24:455-456.
7. Survey of Vietnamese Refugee Centers for Intestinal Parasites. MMWR 1975; 24:398-403.
8. Barrett-Connor E: Latent and chronic infections imported from Southeast Asia. JAMA 1978; 239:1901-1906.
9. Mattson RA, Dang Dinh Ky: Vietnamese refugee care: Psychiatric observations. Minnesota Medicine 1978; 61:33-36.
10. Vignes AJ, Hall RCW: Adjustment of a group of Vietnamese people to the United States. Am J Psychiatry 1979; 136:442.
11. Harding RK, Cooney JG: Problems of Southeast Asian children in a refugee camp. Am J Psychiatry 1977; 134:407-410.
12. Survey of Intestinal Parasites-Illinois. MMWR 1979; 28-346-347.
13. Health Status of Indochinese Refugees. MMWR 1979; 28-385-398.
14. Health Status of Indochinese Refugees: Malaria and Hepatitis B. MMWR 1979; 28-463-470.
15. Diphtheria in Indochinese Refugees from Thailand. MMWR 1979; 28-509.
16. Health Status of Kampuchean Refugees-Sakaeo, Thailand. MMWR 1979; 28:545-546.
17. Health Status of Kampuchean Refugees-Khao I. Dang. MMWR 1979; 28:569-570.
18. Huisman THJ, Jonxis JHP: The Hemoglobinopathies - Techniques of Identification. New York, Dekker, 1977.
19. Pearson HA: Sickle cell syndromes and other hemoglobinopathies: Smith's Blood Diseases of Infancy and Childhood. St. Louis, Mosby, 1978.
20. Flatz G: Hemoglobin E: Distribution and population dynamics. Humangenetik 1967; 3:189.

21. Chernoff AE, *et al*: Studies on hemoglobin E: The clinical hematologic and genetic characteristics of the hemoglobin E syndromes. J Lab Clin Med 1956: 47-455.
22. Journal of the Iowa Medical Society 1975; 65:508-510.

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Health, Obesity, and Earnings

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Abstract: Published reports and economic theory suggest that a worker's earnings may be affected by his degree of obesity. The purpose of this research was to estimate the size of such an effect. The earnings-obesity hypothesis was tested with data from the National Longitudinal Survey of Mature Men. Results of the test suggest that, for members of that sample, there is no earnings-depressant effect due to obesity. (*Am J Public Health* 1980; 70:1006–1009.)

Introduction

On January 2, 1974, *The New York Times* quoted a study by Robert Half Personnel Agencies finding that overweight executives are penalized $1,000 per pound of excess weight during the courses of their careers.* Such an account raises an interesting issue concerning the nature of labor markets and the market value of health capital: is weight reduction *per se*, apart from improvement in health status, a worthwhile investment in human capital?** While several scholars have found health status to be a significant determinant of labor market experience,[2] none have looked at the independent effect of weight.*** This paper attempts to fill that gap in the literature.

Economic theory suggests three market processes which might lead to a wage depressant effect of obesity, apart from other aspects of health status. The first of these can be described as "cosmetic discrimination," a simple distaste for overweight employees, measured as a coefficient of discrimination.[4] The second theory predicting a wage depressant effect of obesity is that of statistical discrimination.[5] An individual's degree of obesity may be perceived by his employer as a proxy for some nonobservable productivity-related characteristic such as discipline or intelligence. An employer may then hire the obese employee only at a reduced wage. Statistically, the resulting low wages would constitute an obesity-related effect. The third theory predicting lower wages for obese individuals relates to human capital acquisition through on-the-job training. If an employer should fail to provide on-the-job training to the employee who displays obesity, that employee's wages would increasingly lag behind the wages of others.‡

Whatever the source of the hypothesized wage depressant effect, it may manifest in any or all of three forms:

> "You can never be too rich or too thin." (*Rich/Thin*) Wages may be negatively related to the degree of obesity in a linear fashion. That is, controlling for the other factors which influence wages (including health status), wages should be negatively related to the ratio of actual weight to desired weight.

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*Despite repeated requests, the authors have been unable to to secure a copy of the original study by Robert Half Personnel Agencies.

**Human capital consists of the productive capacity embodied in individual workers and amenable to change through investment in education and health.[1]

***The authors recognize that in focusing on the effect of obesity on the earnings of the employed, they may fail to capture the greatest effect of obesity on income: differential labor force participation.[3] Further, casual observation suggests that the high carbohydrate diets of many low income families may generate reverse causation, low income generating obesity. We have not attempted to control for this simultaneity.

‡This would be so if general and job-specific on-the-job training were jointly produced.[1]