Indigenous Health Aides as Counselors to Parents About Nutrition

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DESPITE increased educational efforts by public health workers, iron deficiency anemia remains as widespread among children of lower socioeconomic levels as it was 20 years ago. In 1947, Baty (*1*) observed the condition in 34 percent of 1,500 Boston children. In recent years, the incidence has been reported as 27 percent of 286 children in New York City (*2*) and 76 percent of 450 children in Chicago (*3*). In 1967, Gutelius (*4*) reported that 68.5 percent of 460 Negro children under 2 years of age were iron-deficient. These children attended well-baby clinics in Washington, D.C., and their parents presumably had been instructed concerning adequate infant nutrition.

In 1965, a random survey was conducted of 1,000 preschool children brought for care to the pediatric emergency room of Los Angeles County General Hospital. Twenty-one percent of them had a concentration of 10 grams of hemoglobin per 100 cc. of blood or less and microcytic, hypochromic, nonsickling anemia. More than two-thirds of these children had been or were currently attending local public health stations (*5*). Half of the children also had been seen by private physicians at some time. It is likely that many of the parents previously had received dietary advice from a professional person.

In a similar study, Delgado and associates (*6*) analyzed the diets of migrant Negro families who had been given instructions at a Florida family health center. The diets of only 34 percent of the 35 families met the National Research Council's recommended content of dietary iron, and many diets reached the standard only because the migrants consumed excessive amounts of iron-rich legumes. Accepting medical care and well-child counseling at a public health facility does not insure that an indigent parent is informed and will provide an adequate diet for his children. Further, simply recommending to such parents that a child be given a standard solid-food diet does not prevent iron deficiency anemia in children (*3*).

Suchman (*7*) found that lower socioeconomic and some minority groups are significantly socially isolated or ethnocentric. This ethnocentrism is frequently related to little knowledge about disease, unfavorable attitudes toward medical care, and great dependency on lay or "folk"-oriented health practices. Attempts to reach these groups, to be effective, should be in familiar terms and should take into considera-

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tion cultural dietary idiosyncrasies or habits, the cost of iron-rich foods for large families with low earning power, available cooking facilities, and buying habits which are sometimes disorganized. Finally, teaching should be in the nonscientific words and colloquial phrases that the poorly educated understand. As Reiff and Riessman (*8*) stated, the educator should speak the language of the poor.

In order to test the validity of these hypotheses on communication, a study was designed with these purposes:

1. To determine whether indigenous health aides, recruited from ethnic and social groups similar to that of the pediatric emergency room patients and given brief instruction in nutrition, could successfully counsel parents about one condition—iron deficiency anemia.

2. To compare the effectiveness of the aides with that of professionals with middle class backgrounds, in this case second-year medical students.

Results of the 1965 survey showed that patients treated in the pediatric emergency room of Los Angeles County General Hospital and their families are representative of those in the lower socioeconomic levels in Los Angeles in that the educational level of the parents was at the eighth grade or less. The ethnic distribution was 50 percent Negro, 35 percent Mexican-American, and 15 percent white. Sixty percent of the children had been born in this hospital (*5*).

Four indigenous health aides, whose ages ranged from 18 to 22 years, were recruited from the local Youth Opportunities Unit. All were women. Two were married and each of these had one child. The other two came from families with 10 and 12 siblings. Three aides were Negro and one was Mexican-American. All were high school graduates, but none had had formal instruction in health sciences. All lived in depressed socioeconomic areas of the city.

Two public health nurses and a dietitian instructed the aides concerning the composition of a standard iron-rich diet and the necessity of restricting ingestion of milk to 1 pint daily. The period of instruction totaled 4 hours over a 4-day period. The aides then spent 4 hours a day for 2 weeks observing the dietitian counsel parents. The instruction period was short so that the aides would not add technical terms to their vocabularies, a change which would decrease their effectiveness in communicating with peer groups.

Two white second-year medical students were the middle class, educated professionals whose counseling was compared with that of the aides. Davis noted that of 50 patients instructed by medical students, 63 percent complied. This approximates the patient rate of compliance with the advice of graduate physicians (*9*). The students performed the laboratory tests under the supervision of the staff hematologist and prescribed medication under the supervision of the director of the outpatient department. The dietitian instructed the students in prescribing the standard iron-rich diet; however, both had prior instruction in nutrition.

Method

The criteria for a diagnosis of iron deficiency anemia were a concentration of 10 grams of hemoglobin per 100 cc. of blood or less or packed cell volume of 30 or less and microcytic, hypochromic, nonsickling anemia noted on a stained blood smear. The staff hematologist examined blood smears of all patients in this study.

During June, July, and August 1967, the students drew blood samples from randomly selected patients 6 to 36 months old, who were brought to the emergency room for care of an illness unrelated to anemia. Children with a packed cell volume of less than 20, who were often otherwise seriously ill, were excluded from the study.

A total of 59 children met the criteria for iron deficiency. Of these, 35 were Negro, 19 Mexican-American, and 5 white.

Fifty-seven mothers, one father, and one guardian were interviewed by the medical students who used a standard questionnaire designed for computer analysis. The questions concerned the patient's nutritional history, particularly the amount of milk consumed, his medical history, and the social and disciplinary patterns of the family.

Following the interview, an aide or a medical student explained in detail a standard iron-rich diet to alternate families. The diet limited milk consumption to 1 pint daily, replacing it with

cereal, eggs, fruit, vegetables, and meat. Weaning from the bottle was recommended for children over 1 year old. The parent was given a printed list of foods high in iron to supplement the oral instruction. No attempt was made to match ethnicity of the aide to that of the family. Of the 59 families, 30 were counseled by aides and 29 by second-year medical students.

Since the purpose of the investigation was to test the parents' recall of instruction and not to observe the effect of diet on anemia, the parents were given soluble iron sulfate drops for the children. The children's hematocrit values were checked at the first followup visit, 3 weeks later, and again at the second visit, 6 weeks later.

At the first followup visit, the students reinterviewed the parents to test recall of the instructions they had received regarding diet and to determine whether they were following the instructions. The interviewers gave cardboard pictures of 100 foods to the parents and asked them to select all foods closest in appearance to those which the anemic child had eaten the previous day and mount these on a flannel board and then to select from the foods on the board those prescribed in the standard diet.

Parents received 10 points for each food on the flannel board which represented one category listed in the iron-rich diet—cereal, egg yolk, one or two vegetables, one or two meats, and one or two fruits—and 5 points for orange juice. A total of 65 points was the maximum attainable.

The interviewers then questioned the parents concerning the amount and type of milk, sweets, and high-caloric non-nutritious snacks and soft drinks the child ingested the previous day. Ten points were given for each of these actions: use of skim milk, ingestion of less than 1 pint of milk, and avoidance of soft drinks, potato chips, and sweets. A maximum of 30 points was attainable.

Finally, the interviewers questioned the parents concerning the type and amount of food the child should eat if dietary instruction had been followed. A total of 85 points was attainable if the parent correctly had identified all the food prescribed, had reduced milk intake, and had avoided giving soft drinks and snacks to the child.

The median score was determined for each category. The parents who were above this median were those likely to be complying with dietary instructions; those below the median were ignoring the instructions.

Results

Of the 59 parents in the study, 52 returned for the first appointment and 31 kept both return appointments. At the first visit 21 children were considered improved (a rise of 2 grams of hemoglobin per 100 cc. of blood). Twelve of the parents had been counseled by health aides and nine by the medical students. Of the 31 patients not improved at the time of the first return visit, the parents of 15 had been given dietary advice by the aides and 16 by the medical students.

Parents of 17 of the 31 unimproved patients kept the 6-week second return appointments. At this time 10 of the children were considered improved; the remaining seven were referred to a hematology clinic for followup.

At the first visit, 46 parents were interviewed satisfactorily. Of these, 23 had been counseled by health aides and 23 by medical students. In the remaining six families, the child was not accompanied by the parent who had been counseled originally.

The table indicates that there was no significant difference in the scores attained by parents counseled by the aides and parents counseled by the medical students. When the scores they could attain on all three tests were totaled, the difference again was not significant, although the aides tended to be more successful than the students in this small series of patients.

We did not attempt to differentiate between individuals aides or students since the numbers were too small for comparison. We recognize that some aides may have been more successful than others.

Comments

Demand for specialized pediatric services continues to exceed the supply of manpower to render them, especially in large public pediatric emergency rooms and health centers. We estimate that 25 percent of the preschool children brought to our emergency room need changes in diet. A dietitian is not always available, and the number of parents is too large for one person to

counsel adequately. Other personnel—public health nurses, health educators, and physicians, who traditionally handle these tasks—are also scarce. Can nonprofessional persons be trained to perform the professional function of counseling the parents of an ill child?

Our observations suggest that indigenous nonprofessionals transmitted dietary information about iron deficiency anemia to parents and persuaded the parents to carry out dietary instructions as capably as the medical students when dealing with persons in lower socioeconomic levels.

While we cannot state that all persons recruited from lower social classes are qualified to extend professional services, we were impressed that these youthful aides were able to accept a role of authority after a short period of didactic training. We agree with Reiff and Riessman (*8*) that graduated, active, on-the-job training is preferable to lectures in motivating indigenous aides to perform effectively. Formal training should not be prolonged to such degree that the aide assimilates the technical language and attitudes of the middle class professional and loses the familiar colloquial style which helps him to bridge communication gaps.

We had hoped that the indigenous aides, because of their social and ethnic backgrounds, individual styles, and natural empathy with the parents, would be able to counsel peer parents more successfully than middle class medical students. The aides performed as well, but not statistically better, than the professionals. The effectiveness of older aides and persons with more extensive training or experience needs to be explored.

The aides' failure to motivate a greater proportion of parents may have been due to lack of authority or to initial anxiety, which was transmitted to the parents, about giving medical advice. Some families may not have been able to comply with the dietary instructions because they lacked money. The table indicates that the parents' recalled knowledge of an adequate diet exceeded their actual compliance in supplying the recommended foods. Finally, a number of families may have failed to comply because of lack of education, hostility, cultural patterns, and generally low intelligence.

Implications of this study are that nonprofessionals can transmit at least the dietary advice given in a busy pediatric emergency room. Aides instructed about treatment of a few other uncomplicated conditions, such as upper respiratory infections, impetigo, and simple gastroenteritis, could save physicians' time. After the diagnosis is established, aides could explain to parents the home care of an ill child. Indeed, the indigenous nonprofessional may be even more effective than the professional in transmitting technical advice in a less formal manner.

Summary

The effectiveness of indigenous health aides in counseling persons from low socioeconomic levels was explored in a study of parents who came to the pediatric emergency room of Los Angeles County General Hospital. Fifty-nine parents

Results of tests of parents' compliance with instructions and their recall of nutrition information, Los Angeles County General Hospital, 1967

Parents' compliance and recall	Counseled by medical student		Counseled by aide	
	Number	Percent	Number	Percent
Foods eaten previous day: [1]				
Above median	12	52	12	52
Below median	11	48	11	48
Limited milk and sweets previous day: [2]				
0 points	4	17	1	4
10 points	7	31	10	44
20 points	12	52	12	52
Knowledge of iron-rich diet: [3]				
Above median	15	65	14	61
Below median	8	35	9	39
Total knowledge and compliance: [4]				
Above median	10	43	12	52
Below median	13	57	11	48

[1] Maximum score 65 points, median 43 points.
[2] Maximum score 30 points, $\chi^2=2.4$; $P=0.3$.
[3] Maximum score 65 points, median 43 points. $\chi^2=0.09$; $P=0.34$.
[4] Maximum score 180 points, median 140 points, $\chi^2=0.35$; $P=0.06$.

whose children had iron deficiency anemia were advised on nutrition. Four female aides counseled 30 parents and two second-year medical students with middle class backgrounds counseled 29 parents.

Tests of parents' compliance with and recall of advice were given 3 weeks later. Both the aides and the students successfully counseled two-thirds of the parents. There were no statistically significant differences in the effectiveness of the aides and the medical students. These results suggest that young aides can, after brief on-the-job instruction, give advice on nutrition and thus help to lower the incidence of iron deficiency anemia, a condition that is still widespread among children in low socioeconomic groups.

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Treatment for Hyaline Membrane Disease

A new treatment for hyaline membrane disease, a deadly pulmonary disorder which affects newborn infants, has been developed by Dr. Douglas R. Shanklin, professor of obstetrics and gynecology and of pathology at the Pritzker School of Medicine of the University of Chicago.

Shanklin believes that the administration of an artificial atmosphere of oxygen and sulfur hexafluoride could save many afflicted babies from this, as yet, incurable disease.

Hyaline membrane disease attacks a baby's lungs, causing asphyxiation when a protein membrane seals off the air sacs. Each year the disorder kills more than 25,000 premature and newborn babies.

After a 3-year study, oxygen has been singled out as a "contributing factor" to the illness. Large doses of oxygen, now given to weak babies as a treatment, may instead injure the infant by increasing pulmonary distress. An oxygen level of 30 to 40 percent or even the normal air mixture could be very harmful.

Excessive amounts of oxygen can contribute to pulmonary diseases. Too much oxygen could result in breathing difficulty or cause blindness through the formation of eye lesions. Although a baby with hyaline membrane disease may be suffocating, an overdose of oxygen will only increase his problems.

Shanklin suggests that an air mixture of 40 percent oxygen and 60 percent sulfur hexafluoride might enable the diseased lungs to absorb a safe amount of oxygen without toxic effect.

Sulfur hexafluoride molecules are so large and heavy that they block many of the smaller oxygen molecules trying to enter cell membranes. A great many oxygen molecules will bounce off the sulfur hexafluoride particles. The child will exhale this oxygen and all of the sulfur hexafluoride.

Using newborn rabbits as subjects, Shanklin tested four other gases during his study of oxygen interference. He eliminated helium, nitrogen, neon, and argon because the molecules of these gases are too small to interfere effectively with oxygen.