

Maternal Knowledge of Nutritional Anemia

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IRON DEFICIENCY anemia in infants is a common nutritional problem (1,2) and often is clinically associated with excessive intake of milk—well over a quart per day. Spock (3) and Holt (4) note the advisability of limiting the intake in infants.

If excessive intake of milk is to be avoided in infants, it is important that mothers be aware of iron needs and sources and of the association of excessive milk intake with iron deficiency. Clinically, it was noted that intelligent, well-motivated parents apparently were unaware of the possibility that excessive intake of milk would diminish their infants' appetite for other foods and cause nutritional anemia (5). This observation prompted a questionnaire survey of maternal knowledge related to iron deficiency anemia in infancy.

Target Group

The survey was conducted in 1966 by the University of Michigan Medical Center at Ann Arbor. Four groups of women, two from Ann Arbor and two from Wayne County, Mich. (total, 281), completed the questionnaire, which was prepared at the university.

Group A consisted of 57 women, expecting their first child, who were enrolled in expectant parents' classes in Ann Arbor, a university community. Their mean age was 25.7 years. Thirty-four (60 percent) were college graduates; only

two (3.5 percent) had less than a high school education. Fifty-one were white and six were nonwhite other than Negro.

Group B consisted of 83 women, with a mean age of 25.4 years, whose children received well-child care at the Ann Arbor Child Health Center. Twenty-five (30 percent) were college graduates; six (7 percent) had less than a high school education. Seventy-one were white and 12 were Negroes.

Groups C and D were women who had just delivered a child at Wayne County General Hospital, which serves a population having a lower socioeconomic status than that of Ann Arbor. Group C consisted of 52 women, with a mean age of 19.3 years, delivering their first child. Twenty-seven (52 percent) had less than a high school education, 17 (32 percent) were high school graduates, six (11.5 percent) had some college training; two (3.8 percent) were college graduates. Twenty-four were white and 28 were Negroes. Group D consisted of 89 women, with a mean age of 23.9 years, delivering other than their first child. Sixty-six (74 percent) had less than a high school education, 19 (21 percent) were high school graduates, three (3.4 percent) had some college training, and one (1.1 percent) was a college graduate. Forty-three were white; 46 were Negroes.

Questionnaire and Results

The questionnaire consisted of eight multiple-choice questions with one or more acceptable answers.

Question I: A baby should get shots to protect him against certain diseases. Please check which kind of shots a baby should have in the first year of life:

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Whooping cough, diphtheria, and tetanus () ; poliomyelitis () ; chickenpox () ; mumps () ; measles () ; smallpox () .

About 90 percent of each group indicated the need for immunization against whooping cough, diphtheria, and tetanus. The percentages of each group indicating the need for immunization against poliomyelitis were: A, 63 percent; B, 80 percent; C, 54 percent; and D, 51 percent. For immunization against measles, the percentages were: A, 51 percent; B, 75 percent; C, 44 percent; and D, 46 percent. For immunization against smallpox the percentages were: A, 81 percent; B, 87 percent; C, 71 percent; and D, 70 percent. Twenty-three percent of the women in Ann Arbor and 30 percent of those in Wayne County indicated that a baby should be immunized against chickenpox. Ten percent in group A and 14 percent in group B of the Ann Arbor women and 15.3 percent in group C and 24 percent in group D of the Wayne County women indicated a need for immunization against mumps.

Question II: At what age would you expect a baby to begin to walk?

3 to 4 months () ; 6 to 7 months () ; 9 to 15 months () ; 18 to 24 months () .

All four groups did well on this question, with 90 percent or more responding 9 to 15 months.

Question III: Babies usually are ready to start toilet training at one of the following ages:

6 to 9 months () ; 12 to 14 months () ; 18 to 24 months () ; 36 to 48 months () .

The acceptable answer is 18 to 24 months. About 70 percent of the Ann Arbor women selected this answer. In contrast, only about 40 percent of the Wayne County women checked this answer, while another 40 percent checked 12 to 14 months.

Question IV: If you use milk by bottle instead of breast feeding, how much milk do you think you will feed your baby?

As much as he wants () ; as much as he wants up to a quart a day () ; as much as he wants up to two quarts a day () .

The answer "as much as he wants up to a quart a day" is the most acceptable one considering the need to avoid excessive intake of milk (3,4). This answer was selected by 14 percent of group A, 54 percent of group B, 19 percent of group C, and 33 percent of group D (see table). The

answer "as much as he wants" was selected by a majority of each group except the child health center group, of which only 39 percent selected this answer.

Question V: How many 8-ounce (regular size) bottles full of milk make a quart?

3 () ; 4 () ; 5 () ; 6 () .

About 80 percent of the four groups selected "4" as the correct answer.

Question VI: Babies who do not get the right kind of food in their diet might develop which of the following diseases:

Soft bones or rickets () ; easy bruising or scurvy () ; crossed eyes () ; thin blood or anemia () ; hearing problems () .

Seventy-seven to 97 percent of the women indicated that a deficient diet can cause soft bones or rickets. Deficient diet as a cause of easy bleeding or scurvy was recognized by 58 percent in group A and 63 percent in group B of the Ann Arbor women and by 31 percent in group C and 22 percent in group D of the Wayne County women. Anemia resulting from a deficient diet was identified by 75 percent of both Ann Arbor groups and by 38 percent in group C and 53 percent in group D of the Wayne County women.

Question VII: Eggs and meat are high in their content of one or more of the following:

Protein () ; Starch () ; Iron () ; Calcium () .

That eggs and meat are high in protein content was recognized by 100 percent of group A, 99 percent of group B, 85 percent of group C, and 80 percent of group D. Only in group B did a majority of the women know that eggs and meat have a high iron content. This fact was known by 28 percent of group A, 54 percent of group B, 37 percent of group C, and 48 percent of group D.

Question VIII: Why might you want to limit milk in a baby?

Because it contains too much protein () ; because it is fattening () ; because it contains no iron and prevents baby from eating other foods () ; because it contains too much iron () ; I never want to limit milk in a healthy baby () .

The answer "because it contains no iron and prevents baby from eating other foods" was selected by 32 percent of group A, 51 percent of group B, 25 percent of group C, and 29 percent of group D. A number of women gave more

Affirmative responses to questions concerning nutritional anemia

Response	Expectant parents' class (group A=57)		Child health center mothers (group B=83)		Primiparas (group C=52)		Multiparas (group D=89)	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Feed as much milk as wanted up to 1 quart.....	8	14	45	54	10	19	29	33
Poor diet can cause anemia.....	1	27	62	75	20	38	47	53
Eggs and meat are high in iron content.....	16	28	45	54	19	37	43	48
Might want to limit milk be- cause of no iron and prevents eating other foods.....	18	32	42	51	13	25	26	29

¹ Actual total of 36 answers (27 affirmative) because of phrasing error in several questionnaires.

than one answer to this question. The answer "because it is fattening" is a reasonable one. This answer was selected by 26 percent of group A, 24 percent of group B, 3.8 percent of group C, and 6.7 percent of group D. The answer "I never want to limit milk in a healthy baby" was selected by 47 percent of group A, 31 percent of group B, 63.4 percent of group C, and 53.9 percent of group D.

Discussion

The questionnaire for mothers included subjects related to nutritional anemia and to other aspects of infant care. The well-educated Ann Arbor women replied somewhat more accurately to the questionnaire than the less advantaged Wayne County women. In general group B, the mothers attending the Ann Arbor Child Health Center, had the highest percentage of acceptable answers. Group A, those attending the expectant parents' classes, had the second highest percentage of acceptable responses. Only 28 percent of group A, however, recognized that eggs and meat are high in iron content, and 14 percent selected the answer that they would "feed as much milk as wanted up to 1 quart" (see table).

Each group had generally low percentages of acceptable responses to questions related to iron needs and the association of iron deficiency with excessive milk intake. This was true even for group B mothers, who had been instructed at the child health center to limit daily milk intake to 1 quart to prevent iron deficiency anemia.

Knowledge deficiencies of the well-educated

Ann Arbor women not only referable to iron deficiency anemia but to the need for poliomyelitis and measles immunizations, the age of readiness for toilet training, and the relation of scurvy to diet were surprising. Unexpectedly, the Wayne County women responded to the questions nearly as well as the Ann Arbor women.

The responses of both groups indicate a need for health education about infant care. Women intelligent enough to accurately observe the expected age of walking and to know about a need for DTP immunizations are capable of learning about iron needs and sources, the age of toilet training, and the time for measles and poliomyelitis immunizations.

Physicians providing well-child care cannot assume that even well-educated mothers will know about limiting the intake of milk, if necessary, to encourage consumption of iron-containing foods. Specific instruction for each mother is necessary until there is increased general knowledge in this area.

Summary

The University of Michigan Medical Center in Ann Arbor conducted a questionnaire survey in 1966 to determine maternal knowledge of iron deficiency anemia in infants. The four study groups totaled 281 women from Ann Arbor and Wayne County, Mich. Group A included 57 women who were expecting their first child and were enrolled in expectant parents' classes in Ann Arbor. Group B included 83 women whose children were receiving well-

child care at the Ann Arbor Child Health Center. Groups C and D were women at the Wayne County Hospital: 52 women (C) who had delivered their first child and 89 women (D) who had delivered other than their first child. The questionnaire subjects concerned other aspects of infant care as well as nutritional anemia.

In general, group B had the highest percentage of acceptable answers, and group A had the second highest percentage. Anemia resulting from a deficient diet was identified by 75 percent of both Ann Arbor groups and by 38 (C) and 53 (D) percent of the Wayne County women. All groups, however, had low percentages of acceptable responses to the questions related to the association of iron deficiency with

excessive milk intake. Intensified individual instruction in infant nutrition was indicated.

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Accrediting Bodies of Nursing Education

The U.S. Office of Education has recognized seven accrediting bodies as reliable authorities for approving nursing education. They are the National League for Nursing, Inc., and the six regional accrediting associations: Middle States Association of Colleges and Secondary Schools, New England Association of Colleges and Secondary Schools, North Central Association of Colleges and Secondary Schools, Northwest Association of Secondary and Higher Schools, Southern Association of Colleges and Schools, and Western Association of Schools and Colleges.

Responsibility for recognizing accrediting agencies for nursing education is assigned to the Commissioner of Education by the Nurse Training Act as amended by the Health Manpower Act of 1968. State agencies may also be recognized by the Commissioner of Education as accrediting agencies for nursing education.

Schools accredited by the seven associations

and by State agencies to be determined later this year will offer high quality in nursing education. In addition, the availability of financial assistance will make it possible for more young people to enter this profession, where shortages are acute.

The Commissioner of Education has recognized the National Association of Practical Nurse Education Services and the National League for Nursing, Inc., as accrediting agencies for instruction and schools of practical nursing.

Students in accredited schools of practical nursing are eligible to borrow under the guaranteed loan program, which is available to students in both institutions of higher education and eligible vocational schools. To obtain a guaranteed loan a student should apply to a bank, savings and loan association, credit union, or other lending agency.