

Vitamin Supplements and the Incidence of Colds in High School Basketball Players

A Preliminary Report

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The incidence of colds among players on high school basketball teams can be a very real problem from the point of view of winning games and league championships. This is important to the teen-ager and to the school, and is part of the larger problem of keeping this age group in good health and able to do its best both in athletic and academic activities.

It has been recognized for some time that during periods of rapid growth nutritional requirements are greatly increased. The nutritional needs of infants and young children during their development have received much attention, but the adolescent does not always get his share of attention. Many adolescents eat too little, and many more eat poor combinations of food¹. A number of surveys of the diets of teen-agers indicate that they do not receive enough vitamins. One survey² indicated that supplemental vi-

amins and minerals given to school children resulted in significant gains in both academic attainment and growth. The ratio of growth increased from the tenth year to the degree that "in the girl's thirteenth year, and the boy's sixteenth year, the ratio of gain is double that seen in the early years of school life."³ In discussing adolescents, Fischer⁴ states that "subclinical vitamin deficiency is quite common in this age group and in some instances there may even be typical avitaminoses."

A recent report⁵ on the basis for concern about the diet of teen-agers states that "there is little question that this age group as a whole practices limited judgement in the choice of total food eaten." Two of the shortcomings cited are suboptimal supplies of vitamin A and insufficient ascorbic acid. The stresses which occur during adolescence are also discussed—accelerated growth and

Table 1
Composition of Theragran-M Tablets

	<i>Contents of One Tablet</i>
Vitamin A	25,000 U.S.P. units
Vitamin D	1,000 U.S.P. units
Vitamin K	2 mg.
Thiamine mononitrate	10 mg.
Riboflavin	10 mg.
Pyridoxine hydrochloride	5.0 mg.
Vitamin B12 activity concentrate	5 mcg.
Folic acid	0.1 mg.
Niacinamide	100 mg.
d-Calcium pantothenate	20 mg.
Ascorbic acid	200 mg.
Vitamin E	5 International units
Calcium	105 mg.
Iodine	0.15 mg.
Iron	15 mg.
Potassium	5 mg.
Copper	1 mg.
Manganese	1 mg.
Magnesium	6 mg.
Zinc	1.5 mg.

inefficient use of certain important substances as a result of frequent, important emotional problems.

Although boys and girls playing basketball are usually in good physical condition as compared with the majority of high school students, they have the added stress of greater and more frequent exposure to changes in temperature, since they play in hot gymnasiums, take showers, and go out into cold air on repeated occasions.

Materials and Methods

In North Carolina it is well known that high school students eat a poorly balanced diet. Recent studies made by student nurses from the University of North Carolina Nursing School revealed that the majority of the students have an inadequate diet. A very small percentage drink a glass of milk a day, but many seem to survive on hot dogs and cola drinks. As a means of supplementing these diets and of observing the effects of multivitamins in fortifying the students against winter ills, a program was worked out with the staff and students of the Smithfield, North Carolina, High School. The school officials were enthusiastic, and cooperated in keeping daily charts on the progress of the study.

High levels of ascorbic acid were considered to be necessary to ward off the usual

run of colds, a fact that was taken into consideration in the choice of a supplemental vitamin preparation. Theragran-M* was chosen after the many vitamin preparations available were evaluated for the present purpose. The composition of this preparation is given in table 1.

The boys' and girls' basketball teams, 26 players in all, were examined for upper respiratory infections, and histories of recent colds or sore throats were taken before the study was begun. When first seen, 7 boys and 4 girls had colds or evidence of recent upper respiratory infection. None was severely ill.

The coaches of the teams were put in charge of dispensing the vitamin tablets, one of which was given to each player every day for approximately seven weeks. If a cold or sore throat was reported either at practice or before a game, this was recorded. Each player was given a supply of tablets to take over the week-end while he was at home. An attempt was made to keep the players on the vitamin preparation for the full seven days of every week. Sixteen other boys and girls of the same age and background as the players served as a control group and reported daily to the coaches.

* Supplied by The Squibb Institute for Medical Research, New Brunswick, New Jersey.

Table 2
The Effect of Vitamin Supplements on the Incidence of Colds
in High School Students
(Total Study Period, 848 Days)

Control Group (8 boys, 8 girls)				Group Receiving Vitamins					
January 13 to March 6				Boys (10)			Girls (13)		
Sex	No. Days with Colds	No. Days Absent	Boys	Days of Medication	Days with Colds	Girls	Days of Medication	Days with Colds	
JB*	F	10	..	EB	38	....	PA	43	9**
SC	F	7	2	RB	47	2	AB	43	1**
BC	F	4	..	CW	47	1	MAB	43	5**
BCr	F	9	3	PE	47	2***	LB	43	0
MD	F	4	..	MG	47	3***	BLC	43	0
SNH	F	..	..	SBMc	46	1	PE	43	0
KJ*	F	19	..	JO	42	2	PH	41	0
JO	F	7	..	TH	47	1	NL	43	3
TE	M	6	..	DL	46	3	MC	43	0
BG	M	11	..	SS	46	1	AC	43	0
JOg	M	8	1				LH	43	1
TO	M	9	2				SH	42	0
CO*	M	7	..				BB†	22	0†
JS	M	..	..				
BW	M	..	..				
CY*	M	9	..						
16		110	8	10	454	16	13	535	18

* At least two colds

** Very light colds

*** One day each, mild colds

† Added to group during third week of study
 "Flu" for five days

Records of absences from classes for all students in both groups were also kept. The parents and, if necessary, the family physician were consulted before the medication was initiated. Only two parents asked that their children not be given the vitamins, since these children were on special diets and were receiving other vitamin preparations at that time.

Results

Experimental groups

The results are summarized in table 2. Almost from the start of the experiment there were complaints among the boys who had been receiving their tablets just before practice, of abdominal cramps and some diarrhea (6 boys complained of this condition during the first week). None of the girls who received the tablets just after practice had these symptoms. When the

coaches changed the procedure and gave both groups their vitamin preparation after the practice sessions or games, the symptoms subsided. One boy, however, stopped taking the preparation during the third week of the study at the request of his parents, who felt that it might be causing his vague abdominal complaints. Another boy stopped taking the vitamins during the fourth week of the study because he thought the tablets were causing indigestion. The rest of the players experienced no other symptoms during the remainder of the study.

The girls' basketball team was made up of 13 players, one of whom refused to take the preparation being tested since she was on a diet. The group as a whole, consisting of 12 players, had 19 days of colds and five days of "flu." One girl reported a cold for nine days, another a cold for five days. Two girls,

therefore, were responsible for 14 of the total of 19 days when colds were reported. One of these two girls on four days, had only suggestive symptoms of a cold. It is noteworthy that only two days were missed by the entire group of 12 girls during their seven weeks of school. A new girl joined the team in the third week of practice and promptly had a case of influenza lasting five days. During the time of the study, 535 tablets were dispensed to the girls, and no ill effects were observed in this group.

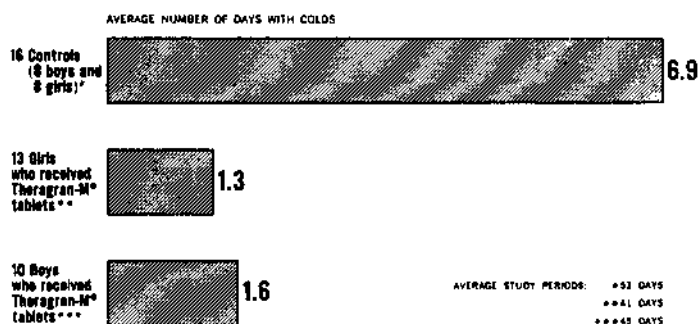


Fig. 1

The boys' basketball team was also made up of 13 players at the beginning of the study, but 3 boys stopped taking the vitamins before it was completed. A total of 454 tablets were dispensed. The majority of colds in the boys' basketball team were noted during the first week of practice—four days of colds involving 3 boys—and only two days of school were missed out of the entire eight weeks.

An unusual circumstance was that 7 boys reported with colds on the same day in the fourth week, but none was noted to have any cold the rest of the week. They had played a hard, rough game the night before, a circumstance that was repeated during the sixth week, when 6 players reported for practice with colds on a Monday, but no colds appeared during the rest of the week. It was questioned whether this was just the effect of strenuous exercise or undue activity over the week-end, since the colds completely disappeared in a 24-hour period. A total of 13 days with colds were reported by this group in two days, and none thereafter. An aggregate of 16 days with colds was reported by members of the boys' basketball team.

Control Group

The control group, made up of 8 boys and 8 girls, differed markedly from the two groups receiving vitamins as to the total number of days on which colds were reported, and the days missed from school. This control group reported 110 days with colds out of a total number of 848 days. Five of the group had colds twice during the period of the study, and only 3 out of the entire group had no colds or other sickness at any time during the study. Eleven had at least one week of colds. Three had 10 or more days of colds or evidence of influenza. The group as a whole missed eight days of school.

Comment

The coaches and the school officials noted a definite improvement in the students given the vitamin supplementation, both in their attitudes and playing ability, from that observed in previous years when no supplements had been given. The coaches were enthusiastic about the greatly reduced number of absences from practice and games. They are interested in continuing the vitamin supplements in future years, not only with the basketball teams but also with the football teams, since the bitter, cola weather of October and November is usually productive of colds and disrupts the athletic program.

Summary and Conclusions

1. Records were kept of the incidence of colds for approximately eight weeks in a total of 39 high school students. Of this group, 13 girls and 10 boys received Thera-gran-M (a multivitamin supplement), and regularly 10 boys and girls of comparable age and background served as controls. The two groups who received the vitamins were members of the basketball teams.

2. The control group reported with colds on an aggregate of 110 days during the study period. The 10 boys who received 454 Thera-gran-M tablets reported colds on 16 days, and the 13 girls who received 535 tablets reported colds on 18 days. This was an average incidence of 6.9 days of colds for the controls, but for those who received vi-

tamins it was 1.6 days for the boys and 1.3 days for the girls.

3. Although the number of students in the two groups was small, it is believed that the vitamins definitely improved the health of the students. It is suggested that all high school students need multivitamin supplements, particularly during strenuous athletics in the fall and winter months.

References

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Correspondence

VITAMIN SUPPLEMENT FOR HIGH SCHOOL STUDENTS

To the Editor:

I write with reference to the article by Dr. Frank E. Barnes, Jr., "Vitamin Supplements and the Incidence of Colds in High School Basketball Players: A Preliminary Report." Dr. Barnes is to be commended for his desire to investigate the possibility that vitamin supplements might benefit the health of high school students. He ends, ". . . it is believed that the vitamins definitely improved the health of the students. It is suggested that all high school students need multivitamin supplements, particularly during strenuous athletics in the fall and winter months."

Unfortunately, these conclusions are not justified in view of the design of the investigation. Undoubtedly the vitamin manufacturers are likely to quote Dr. Barnes' conclusions in their advertising. Again, we should be concerned about the possibility of unnecessary expenditure of money on vitamins by lay persons who are not qualified to interpret the meaning of such a report, and who may be unduly impressed by the conclusions. For these reasons the study needs to be redesigned and repeated. A survey of the article leads to the follow-

ing essential comments. The 16 "other boys and girls of the same age and background as the players" who served as a "control group" unfortunately have one very great difference which was ignored in the study, namely, that they are not basketball players. It is possible that non-players would experience a different number of colds even if they had also been receiving a vitamin supplement. In fact they received nothing, not even a placebo. In any case, the common cold leads a fairly typical course and it is doubtful if the "colds" of one day's duration are the same kind of illness as those of longer duration. Certainly, the presence or absence of a cold is a very subjective factor which must not be left uncontrolled. Other factors include the official enthusiasm described by Dr. Barnes and possibly the day-to-day successes or failures of the teams. It is interesting to notice Dr. Barnes's statement that on one day 7 boys reported with colds following a "hard, rough game the night before, a circumstance that was repeated during the sixth week, when 6 players reported for practice with colds on a Monday, but no colds appeared during the rest of the week." Unfortunately, he does not tell us whether the teams were having a winning or losing streak at that time, but this might have important effects upon the incidence of illness.

All the variables can be fairly adequately taken care of by setting up a carefully controlled study using the double blind technique. It is for this reason that I am writing this letter, not in a spirit of criticism but in the hope that Dr. Barnes will feel encouraged to continue with his work and to repeat it under more scientifically rigorous conditions. A research study such as he is conducting is worth going to some trouble over as the results can prove to be most enlightening. With a minimal degree of assistance, it should be possible for Dr. Barnes to divide his basketball players randomly into two groups who would then receive coded vitamin supplements or identical-looking tablets of no therapeutic value, while neither the players nor those involved in evaluating the study are aware of which people are getting which prepara-

tion. A study of this sort would be open to accurate statistical evaluation and a most important publication would result.

In North Carolina there are three medical schools each with many workers (psychologists, biostatisticians, and others) who are qualified to help design a suitable controlled study. I hope that Dr. Barnes will avail himself of such assistance and I am looking forward to seeing a further article by him.

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University of North Carolina

*(Dr. Barnes' reply to
Dr. Ewing follows.—Ed.)*

Smithfield

Dear Dr. Ewing:

Your comments for a double-blind control study as well as a study done on a bigger scale are certainly worth while criticisms. This sort of thing I have in mind at the present time. I hope to go ahead next year with a study of the Selma and the Smithfield high schools, using one as a control. The study that I undertook at the Smithfield High School was done more out of curiosity than anything else, as I was quite curious about the actual benefits of vitamins on the general public or on growing students. I have been deluged with vitamin literature by the different drug companies, and when Squibb offered me sufficient vitamins to carry out this study I thought I would just follow it through and see if there was any advantage in this type of medication on a growing boy or girl. This study has already been criticized by the A.M.A.'s Council on Nutrition. They felt that a growing boy or girl does not need vitamins. They might be correct. But after the study that was done by the student nurses from the University of North Carolina on our high school students, I was quite convinced that these kids were not on an adequate diet that gave them all the necessary vitamins. We found that a great percentage of these children did not eat a balanced diet, and it is amazing that they can even exist on what they put into their stomachs. I am also convinced that the two sessions of supposedly sore throats or colds that happened on two different oc-

casions were nothing more than evidences of fatigue, as the symptoms disappeared so quickly. I suppose that an ideal study at the present time would be to give the children in the gym classes the vitamins and keep the high school basketball athletes on just the regular diets they receive at home. If I can get the cooperation of the school officials and the parents, I certainly intend to follow up this sort of study as I think it is worth while and will either condemn or show the need for vitamin supplements to our growing high school students.

I am not sure whether vitamins are doing these kids any good or not, but they seem to get through school very well, without colds, and our girls just won the district championship. I would welcome any further investigations by people at schools such as the University of North Carolina or at other high schools. I hope that somebody else will pick this up and continue the study. I know that several of the universities have their athletes on vitamins. Ohio University had their basketball team on vitamins when they went to the National Championship last year. There has also been a study done at the Naval Academy where it was found that huge doses of vitamin C have cut down the incidences of bruises on the football players. All these things will have to be investigated further before we come up with a definite conclusion and I hope that the vitamin distributors will not take advantage of this article to try to impress the public that everybody needs vitamins. Certainly the doctors have been deluged with this kind of thing and I am sure they will not swallow the whole article as a final conclusion.

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