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# Vitamins Are Not Drugs!

**The article, "Are Vitamins Drugs?" by Dr. M. L. Riccitelli in the June issue of *The Apothecary* has prompted the following reply:**

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First, we may say that on the basis of available evidence, we agree with Dr. Riccitelli on many of his points, such as: that vitamins are essential to health; that vitamin deficiency is a relatively common affliction among both the poor and rich; and that some of the causes for this deficiency are poverty, food fads, restrictive (reducing) diets, excessive use of alcohol, etc. We also agree that self-administration of vitamins may instill a feeling of false security, but we can not follow him all the way in his explanations, direct or implied, that the chief danger involved is due to the fact that the individual ". . . may be taking the wrong kind (of vitamins) or the wrong amount or both."

In the first place, it is difficult to see how anyone (in general) can take the wrong kind of vitamins since, as far as we know, each individual needs every kind of vitamin known—plus a few not known! It may be true of course, that the kind being consumed is not the one in which he is most deficient, and that the amount received from his diet plus the supplementary dose, may add up to more than that normally required, thus creating a temporary, or intermittant, over-supply; but in general this should prove more desirable than to risk receiving an under-supply, because the individual tolerance is usually of such magnitude that it would be rarely approached, much less exceeded by the dosages resorted to by the average individual. Apparently then, whatever danger may be involved in the self-administration of vitamins—especially in regards to dosage—arises not so much from a possible over-supply as from an under-supply; that is, from not enough, rather than from too much.

As the problem shapes up to us, the answer or remedy appears simpler and comparatively less risky than the one implied by Dr. Riccitelli; that is, in the average case involving no advanced pathology such as beriberi, scurvy, rickets, etc., all of which call for temporary highly potent dosages under medical observation. The answer in the average case, as we see it is:

1. Either an all-round well-balanced diet, i.e., a diet which includes among other things, ALL the necessary vitamins, or
2. In case such diets are not available (and nowadays they apparently are rare), the re-inforcement of the existing diet with a liberal supply of vitamins, both in kind and amount.

Quite obviously, in the absence of an all-round well-balanced diet, the missing food-factors must be supplied from other sources, or the inevitable result is a nutritional deficiency—malnutrition. It must also be remembered that except under very exceptional circumstances, few, if any, individuals stick to a diet which is entirely void of any food-factor for any prolonged period. The existing diet deficiency must therefore be viewed as a relative one—that it, there is a *partial* deficiency of several food-factors; and higher mathematics is not necessary to conclude that the vitamin "re-enforcement" taken to remedy that deficiency should contain *all* the missing factors, both known and unknown, and not just one, two, or three, etc.

As for the danger resulting from a feeling of false security, it would seem to arise only when the individual, feeling he is being well-fortified by consuming a few selected vitamins, fails to realize he is becoming more and more deficient in all the others. To this may of course be added the already mentioned danger, namely that the vitamins actually taken are consumed in amounts too small to meet the normal requirement, thus giving rise to another, less suspected and more treacherous deficiency; and finally, that the individual, by consuming a few specific vitamins, is actually aggravating the deficiency symptoms created by the shortage of the other vitamins. In other words, the vitamin imbalance created by the consumption of a few vitamins, seems, in some ways, to be more deleterious than is the effect from an all-round deficiency. (See Brit. Med. J., March 31, 1945; Imbalance of Vitamin B Factors, by Marion B. Richards.)

All in all, this problem is not too complex for anyone to understand; and it would seem that if dieticians and writers on the subject would strive to lay the plain basic facts before the public, in place of a continuous chilling cry of danger—beware!—the limited risk involved in the self-administration of vitamins would be quickly controlled. Certainly, it should prove less risky than the self-administration of headache pills and sleeping powders.

The preceding, we believe, clarifies our inability to agree with Dr. Riccitelli about the danger arising from self-administration of vitamins. However, it was not this point which prompted our own writing; we were intrigued chiefly by his classification of vitamins as drugs, but, before commenting on that point, it seems appropriate to inject the two following paragraphs:

In the language of the nutritionists, a malnutrition involving several food-factors is called a "multiple deficiency," and that this condition exists in most cases of malnutrition is acknowledged by Dr. Riccitelli in his closing paragraph. In view of the agreement on this question, it may be of interest to submit here what seems to be the most obvious cause for these multiple deficiencies, and the equally obvious remedy:

Few, if any, foods consist of only one food factor. Sugar, being a pure carbohydrate, would be one of the exceptions; but, then, sugar is also one of our so-called



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"refined" foods. In its natural state, it, like other natural foods, is a mixture of many food factors, including various vitamins and minerals. However, no single food, natural or otherwise, contains ALL the food factors in the amounts required for a nutritional sufficiency. *Raw* milk, and *whole* wheat, perhaps come as close as any in meeting such a requirement, but even these fall short of supplying everything needed for the highest physical efficiency; and a well-balanced diet therefore requires the ingestion of a variety of food substances. However, just as no one food-substance contains ALL the necessary factors, so also it may be considered true in general that *every* food-substance contains *several* food-factors; from which it follows that, if one food-substance is withheld from the diet for a prolonged period, the resulting nutritional deficiency is related to *all* the factors usually present in that food-substance. The same of course holds true when a certain food-substance has been subjected to a so-called "refinement" process during which most of the vitamins have been destroyed or removed. A prolonged consumption of any such "refined" food must of necessity result in a deficiency, the "multiplicity" of which is directly related to the number of food factors removed in the "refining" process. Our modern flour mills, for example, are said to remove over twenty essential food factors (vitamins, etc.) in processing the grain into white flour; and since this type of flour constitutes no small part of the nation's diet, the removed factors must be supplied from some other source. Note carefully, however, that it isn't enough to replace just one, two, or even six, of the removed factors: all "twenty" must be supplied if malnutrition is to be prevented. It need hardly be added, of course, that since most vitamins, etc., are obtainable from more than one food-substance, the withholding or "refining" of one such a substance results, not in a *total* deficiency of the vitamins involved, but a partial one —proportional to the previous consumption of that particular food.

Now then for the vitamin-drug question: As a first step let us assume that vitamins are one of two things, either a food or a drug. Dr. Riccitelli's implication that they are both foods and drugs, depending on *how* and *why* they are consumed, appears more arbitrary than factual. It would have been helpful if the doctor had given us his definitions of foods and drugs. In such discourses, definitions serve not only as weapons but also as rules of the game, and without them no conclusion can be formed, one way or the other.

Our second step then, becomes one of presenting the necessary definitions as far as they can be found. From a legal point of view, particularly one of clarity, it would seem logical to accept definitions issued by the Food and Drug Administration for the purpose of law-enforcement. From the Federal Food, Drug and Cosmetic Act (revised August, 1941), we quote:

> "The term 'food' means (1) articles used for food or drink for man or other animals, (2) chewing gum, and (3) articles used for components of any such article."

From this, one may justly conclude that "food" (or any component thereof) is just what it says it is—namely, FOOD, and nothing else! Also, since the term "food," as used twice above, no doubt has the same meaning in both instances, the definition can apparently be read with equal clarity—either forward or backward—both coming or going! Momentarily, this has us stumped since we are still minus the definition for "food," except that it means —food!

Nevertheless, let us see how the same authority defines "drug." Perhaps this will help clarify matters. We quote:

> "The term 'drug' means (1) articles recognized in the official U. S. Pharmacopœia, official Homeopathic Pharmacopœia of the U. S., or official National Formulary, or any supplement to any of them; and (2) articles intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease in man or other animals; and (3) articles (other than food) intended to affect the structure or any function of the body of man or other animals; and (4) articles intended for use as a component of any articles specified in clause (1), (2), or (3); but does not include devices or their components, parts, or accessories."

This definition, to say the least, is rather all-embracing and should facilitate the classification of any substance as to whether or not it is a drug, were it not for the fact that it includes the term "food!" Lacking a definition of the latter, except that "food is food," one is unable to decide just what to "except" in group (3), all of which leaves us as much in the dark as before. To be sure, group (1) is quite specific—in fact, almost too much so, since it puts the drug-label on such "articles" as water, lard, olive oil, sugar, and simple syrups; which in turn, it seems makes every kitchen a professional drug store, and every cook, ex-officio, a dispensing pharmacist—without portfolio!

It may also be noted with interest that on the basis that things listed in the pharmacopœia are drugs, such "articles" as vitamin C, thiamin, riboflavin, and niacin are drugs, while apparently several other vitamins are not; which fact may, or may not, be confusing in view of the listing of two such "biological" extremes as sodium chloride and sodium cyanide—one essential for life, the other a most deadly poison! Apparently, as far as the Food, Drug and Cosmetic Act is concerned, it is not the physiological effect of a substance which determines whether or not it is a drug, which raises the question:

On what basis is—or should—the classification be made?

Since time and space prohibit a thorough consideration of this perplexing question as a whole, we shall proceed on the basis apparently assumed by Dr. Riccitelli—namely that of therapeutics, or rather Nutrition and Therapeutics. In brief, he says or infers: 1—if the vitamins are obtained as components of natural food, they too are foods; 2—if they are obtained "artificially" (presumably as a separate morsel) to remedy the effects of an inadequate diet, then they are medicines or drugs.

Assuming that the vitamins themselves are inherently alike, whether they be consumed "artificially" or otherwise, Dr. Riccitelli's classification seems to be based, not on any special characteristic of the vitamins as such, but rather on how they are consumed and on the physiological condition of the consumer. However, if such a basis can be accepted for the classification of the vitamins, then it should be equally applicable in other instances; say, in case of strychnine and morphine: Would Dr. Riccitelli assert that these substances are drugs only when administered as a remedy for some specific ailment, and not drugs if taken by someone not in need of them?

Dr. Riccitelli's deductions also prompt the following questions. First: If, after a vitamin deficiency has developed, it is combated, not "artificially" by vitamins as separate morsels, but by a well-chosen, vitamin-rich diet, i.e., a diet containing the same vitamins as would otherwise be given "artificially"—would such a diet be food—or a drug? A reply to this question should consider the fact that in both cases, the vitamins would mix with the rest of the food in the stomach and subsequently pass through identical digestive, assimilative and metabolic changes, none of which—as far as we know—could be termed pharmacological. Hence, in neither of these cases could the vita-

mins be considered a drug. Secondly: if a non-deficient individual changes to a deficient diet, but prevents becoming deficient by supplying the missing vitamins "artificially," are those vitamins food or a drug? Clearly, the vitamins are here administered, not in the therapeutic sense to *remedy* a deficiency, but as a food-substance to prevent a deficiency which then keeps them out of the drug category, not only on the basis of Dr. Riccitelli's grouping, but also on that of the Federal Food, Drug and Cosmetic Act which, as seen, defined drugs as "articles . . . other than food . . . ."

It appears therefore, that the basis of Dr. Riccitelli's drug selection is a wholly arbitrary one, and that it fails even in the specific case of vitamins for which it was picked, to say nothing about its applicability in the field as a whole. This failure arises chiefly from the assumed synonymity of the two terms, "drug," and "therapeutic agent," as evidenced from the following quote:

> "If the diet is inadequate, we sooner or later develop a vitamin deficiency, and must then supply vitamins artificially. When we do this, the vitamin becomes a medicine or a drug since it is being used as a therapeutic agent in the treatment of a deficiency . . ."

A "therapeutic agent" it may be agreed, is used in the "treatment of disease," and *disease* may be defined as an "abnormal state," functionally or structurally—or both; and an *abnormal state*, in the broadest sense, may include any condition except that of prime physical efficiency, and as such embraces everything from a state of hunger and thirst, either acute or prolonged, to the most depraved conditions of malignancy. It also follows: 1—that any substance employed to remedy such conditions is a therapeutic agent; and 2—that the nature of these agents is as variable as the afflictions themselves, extending from water and common food for the relief of thirst and hunger to such potent drugs as strychnine, or such "specifics" as quinine for the treatment of malaria.

At this point it is timely to note the two distinct classes of afflictions as to cause, as well as the general difference between the respective remedies: In one class are those afflictions which arise from a disturbance in the supply of the normally essential components of the body—such as food, oxygen, water, etc., in which case the general remedy lies in re-establishing the normal supply; in the second group are those afflictions which arise from the presence of *foreign* substances, including bacteria, etc., resulting in states of abnormality as exemplified by malaria. The general remedy here, lies in the introduction of other, contra-active, foreign substances—namely, drugs. This, however, does not preclude the use of drugs in some cases of the first class, as will be seen below.

Relative to the first class, the food supply may be excessive or deficient; but in either case, the remedy is one of adjustment, both in quantity and quality: an excessive supply must be decreased; a deficient one must be increased. Now then, since both procedures aim to remedy an abnormal condition, they are obviously *therapeutic* in nature, which—on the basis of Dr. Riccitelli's assumption—makes the food ingested to remedy a hunger, a drug; but that is not all: We are forced to conclude that, since decreasing the food supply is also a *therapeutic* procedure, then the food *withheld* must also be declared a drug! Not because of any inherent drug properties of course, but because of the *therapeutic* effect induced by its absence!

Although logically derived, the absurdity of the last deduction nullifies Dr. Riccitelli's primary assumption and thus invalidates any attempt to employ "therapeutics" as a general basis for classifying a substance as a drug. As for natural essential foods, etc., it appears doubtful if they can logically be labeled as drugs under any condition—except, perhaps, if administered in such tremendous dosages as to inhibit body functions through tissue destruction, but as we shall see, even here the classification is questionable. The latter phenomenon is, however, sufficiently important to deserve further consideration.

In general, hunger and thirst are merely manifestations of a diminished supply of "transitory" material—food and water, essential for the body functions; and the primary effect of this shortage is a decreased functional (physical) efficiency, which in general, is quickly remedied by restoring the missing food-factors. However, *if the hunger is much prolonged*, the mentioned primary functional deficiency is followed by more severe ones—namely cellular exhaustion and structural breakdown, which ultimately incapacitates the organism from utilizing any further food which may be supplied, and therefore inevitably terminates in premature death unless more effective remedies than food can be resorted to. Such a remedy, though not itself a food, may or may not, of course, contain various food-factors. Basically, however, it is a substance which restores cellular function to a point at which it can again utilize food; in other words, it is a foreign substance, a drug, employed to bring about a biological activity *which can not be produced by the normal food-factors*. In the above instance this activity is aimed to restore cell normality; in many other instances, however, the purpose is just the opposite—as in the case of narcotics: aspirin, for example, in "curing" an ache, does not restore *normality*, but the very opposite! It destroys nerve function. In either case, however, the purpose is one of relief and cure.

Such *non-nutritional* substances then, employed to produce physiological effects not obtainable by essential foods, may logically be labeled *drugs:* and, as already indicated, this definition, we believe, also covers substances used to combat afflictions arising from the presence of foreign substances, bacteria, poisons, etc. If the body can fight off an attack, it does so on the strength of its functional efficiency which in turn is due to nutrition; if foreign, non-nutritional substances are necessary, either internally or externally, they fall in the drug category. Obviously, they are not foods; and if they are not foods, they must be drugs—for, if not the latter, what are they?

It may also be suggested that a drug is any *non-nutritional* substance which is employed to disturb the normal body functions usually to a point beyond their physiological range, or which may restore an equally deranged body function to normality. It is true, of course, that nutritional substances, if taken excessively for example, may also disturb the body functions beyond their normal physiological range, but this can not serve to classify them as drugs, because the *basic* principle of the use of drugs is to render relief from, or to cure, disease; and the consumption of excessive amounts of food to a point of distress can hardly fall in such a category. On this basis alone, essential foods can not be considered as a drug. Furthermore, drugs tend to be habit-forming; essential foods, including vitamins, do not.

To summarize: (1) Basically, vitamins are essential food factors; (2) they exist as components of natural foods, as do proteins, carbohydrates, minerals, etc.; (3) Hunger and malnutrition result from a deficiency of any or all of the essential food factors—including vitamins, and are remedied by supplying the missing factors, either as components of the regular food, or in separate morsels. (4) A drug is a more or less habit-forming, foreign substance, "other than food," employed to produce effects usually not obtainable by essential food factors. (5) Nutritionally and therapeutically, therefore, drugs and vitamins belong in wholly separate groups; i.e., vitamins are not drugs.

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