

Imagine your being the parents of a little girl who started out in life apparently normal and until she was a year old was a nicely-developed infant and proudly standing up on her tiny feet, but who later on became weaker and did not seem to be able to take her first step. At 20 months, instead of running around happily, she hardly managed to stand ^{up} unsteadily with knees bent backward. All her muscles had turned flabby.

Her parents sought medical aid. The doctors found a general muscle weakness as a cause of these symptoms. That was on April 12, 1940, as reported by Dr. Blakeslee in the Journal of Nervous and Mental Diseases. Formerly, this condition would not have held out much hope, but only a few years before a new vitamin had been used in cases of this strange nerve-muscle disorder and so, our little patient was treated with Vitamin E, with the result that on June 10, 1940, ^{barely} two months later, the flabbiness of the muscles had yielded and the child could walk unassisted across the room.

Vitamin E

has come up the hard way into medical practice. Since its discovery its mere existance was discussed and even its essential value in human nutrition disclaimed. Although later results were most encouraging, many years of research will pass until its vital role will have been completely established.

More than decades have passed since Evans and Bishop in 1922 published their first report in science about a factor essential in dietary animal experiments for reproduction - called factor X. Lacking this factor, female rats absorbed their foetus in the womb. Male rats became sterile. In this case as in so many others, the weaker sex proved it could take it better than the stronger sex, for it was only temporarily affected. The male part never recovered its original valuable functions. This means that the male suffered irreparable damage of the reproductive organs but the female, when it got what it wanted and needed, started to function again.

The original, very impressive experiments gave V-E the name of antisterility vitamin, but it took quite some time until scientists accepted it as a worthy member of good standing in that illustrious society of the vitamins, because too many bewildering facts spoke against its admittance.

So far everything seems to have been very simple in vitamin research. When a scientist believed he had found a new vitamin, all he had to do was omit the new factor from test foods, observe the damage in various organs which resulted therefrom, then add the new factor again and see these symptoms disappear. These

specific test diets led to the discovery of all of the alphabetic predecessors of vitamin E and in that way many of the vitamins were known before scientists were able to establish their chemical analysis. But not so with V-E, as it was difficult to deprive the diet of test animals of V-E without very often damaging the animal organism through the methods by this this was achieved. When V-E deficient diets could finally be obtained, the resulting destruction was mostly a final one. Nevertheless, at long last the international unit of V-E was finally created and the new Vitamin was born.

When its chemical synthesis was completed it turned out to be a triplet, the three parts of which looked chemically almost identical. The alpha, beta and gamma tocopherol, of which the alpha is the most effective. The word Tocopherol comes from the Greek:-Tocos- offspring, Pheren - to bear and ol - indicating its alcoholic nature.

Although the original experiments in cases of female sterility or early abortion suggested the clinical application,

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it took nine years until the first physician, Vogt Moeller, in 1931 used it on human beings. He treated two women who had a previous history of four and five abortions respectively and succeeded in obtaining normal pregnancy with healthy children.

Four years later he was followed by Watson and Tew who obtained good results in thirty-four out of forty-six cases. Although the issue is still under discussion, progress is being steadily made for the clinical evaluation of V-E in cases of female sterility.

In the course of further research Evans and Burr, in 1928, observed that V-E deficiency was not only limited to the reproductive organs but showed its destructive repercussions in degenerative changes of the nervous system. Young rats which were partially deprived of V-E became paralyzed at the end of the nursing period.

In the year 1938 many scientists all over the world tried to lift the veil of secrecy of the V-E relations to nerve and muscle degeneration. These findings, more than anything else, have created a new era of scientific interest.

Almost simultaneously, in 1940 Bicknell, in England and Wechsler, in New York reported the first improvement of cases, in which the fading and disappearance of skeleton muscles was caused through degenerative processes of the nervous system, called Lateral Sclerosis and Amiotrophic Lateral Sclerosis. These unpronounceable names cover diseases of various changes in the spinal nerves and

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diseases of the muscle fibres leading to loss of function and elasticity. The knowledge of these diseases is largely based on the apparent symptoms and on microscopic evidence found after the victims have deceased so that the factors which cause them are open to speculation.

From all we know there are two different types of sclerotic diseases. The first, in which the degeneration and destruction takes a comparatively rapid course of one to three years. Today scientists believe that a poisonous factor, such as a virus infection or an inflammation of unknown origin could be held responsible for the more intense ravages which lead to inevitable destruction resistant to any type of treatment. The second one consists of a strange change in the behaviorism of the nervous cells. All of a sudden they refuse to be properly fed or change in a way to make them become highly sensitive to even a slight decrease in the necessary Vitamin supply. A multitude of diseases which may be complicated by these disturbances or caused by them are under investigation as to their benefit from V-E therapy.

During an interview on the aforementioned subject with Dr. Wechsler, which he kindly extended to me, several important factors were discussed. I asked him what induced him to use V-E in the therapy of those disorders. He said he was particularly impressed by the work of Emerson and Kinse in Copenhagen in 1931 and his interest was specially attracted by the fact that many of the Vitamin deficiency states and anemia in human beings or animal experiments created similar pictures as the ones in the above mentioned diseases.

For human nutrition V-E is best concentrated in the germ of cereal grain and green leafy vegetables. Our grandmothers seem to have had a hunch of what is good and health. In many European countries rose hips were used to make preserves and they are the very sources of highest Vitamin E contents in nature.

Meanwhile the original sources are no more the only sources of V-E. In the hands of doctors was placed a synthetic wheat germ oil in concentrated form. This development was very important because in some cases initial results could only be obtained after the more concentrated form was used.

Another nutritional problem in which V-E is helpful, is to assist the human organism to make the best even of a limited fat supply. The body tissues need fat for maintenance and to help assimilate hormones and oil-soluble vitamins. V-E prevents fat from becoming rancid and enables the human being to make the most of fat and thus get along on smaller supplies. Far beyond the digestive problem most other tissues, such as nerves and muscles, are also benefitted. V-E sees to it that the daily repair work, such as replacing used tissue elements, is being done and thus prevents most disease of the vital organs due to infectious and nutritious causes,

Shortly before this report was completed, new startling results of V-E therapy were published by another researcher, Dr. Shute. Everyone knows that the family physician watches closely the kidney function of the expectant mother, and in very many cases, he finds that the kidney is damaged through toxic products formed in the body during pregnancy, damaging the kidney filter during their elimination. In his patients, Dr. Shute found that this damage could not only be prevented, but he even succeeded in repairing it after it had already taken place.

The fascinating aspects and the wide scope of future possibilities only convey a small impression of what this new research victory holds in store, and represents by no means the last chapter in V-E therapy.

As matters now stand, average daily doses for any treatment are approximately 30 milligrams per day. However, from what we know, high doses have been applied, ranging up to ten times and more that amount, without any toxic or ill effects. With almost like many other vitamin treatments, the first effects of V-E should be noticeable within two weeks.

Since V-E treatment is applied in cases which are far too difficult for any layman to judge, diagnose or treat, the close supervision of an experienced physician is imperative to obtain the full benefit of this new therapy.

Let us remember the ^{Four} outstanding qualities of V-E:-

1. ^{ITS} Effect on sterility and habitual abortion.
 2. ^{ITS} influence on henceforth incurable nerve and muscle diseases.
 3. ^{ITS CAPACITY FOR} Stretching the limited fat supplies by enabling the human organism to do ^{ITS ABILITY TO} more and better on less.
 4. ^{ITS ABILITY TO} Improve kidney function and prevent kidney damage during pregnancy.
- It is Nature's wise foresight to endow the cereal germ in our daily bread with this element for its own preservation and ours; for a better world which it will help to construct.

CHRONOLOGICAL DEVELOPMENT OF THE CLINICAL USE OF VITAMIN E

- 1931 VOGT-MÖLLER found that vitamin E as wheat germ oil when administered to women with previous histories of abortion, brought about improvement. In all cases a healthy child was delivered following treatment.
- 1935 WATSON and TEW reported that vitamin E as wheat germ oil prevented abortion in 34 out of 46 cases of previously reported abortion.
- 1936 CURRIE also found that vitamin E was of benefit in the treatment of habitual abortion.
- 1937 SHUTE observed what he considered vitamin E deficiency in women showing signs of abruptio placentae. If treatment with vitamin E had commenced soon enough, the incidence of abruptio placentae would have been greatly reduced.
- 1938 SHUTE reported that in his clinical experience vulvovaginitis correlated with a high content of estrogenic substances in the blood can be successfully treated with vitamin E.

KUNZ found that the administration of vitamin E increased milk secretion in lactating mothers.

WIDENBAUER investigated the effect of vitamin E on the growth of premature infants. The results obtained seem to justify the conclusion that vitamin E would stimulate the growth of these infants.

GAEDKE found that in the 6 cases under his observation, vitamin E administration had no effect upon milk production or the fat content of the milk in lactating mothers.

1939 SCHNEIDER found that vitamin E increased the efficacy of estrogens.

1940 MILHORAT found that prolonged administration of vitamin E to two patients with dermatomyositis was followed by a decrease in creatinuria, an increase in urinary creatinine and definite chemical improvement.

SPIES treated 14 chronically malnourished patients with synthetic alpha-tocopherol injected intramuscularly. Twelve of the 14 were definitely benefited.

SPIES and coworkers found that in peripheral neuritis following arsenic poisoning, the intramuscular injection of alpha-tocopherol was very effective especially in conjunction with vitamin B₆.

BICKNELL found that the administration of vitamin E benefitted cases of muscular dystrophy and amyotrophic lateral sclerosis.

WECHSLER reported that cases of amyotrophic lateral sclerosis responded promptly to treatment with pure tocopherols. He emphasized the importance of early treatment before irreversible damage is done.

1940 STONE found that the administration of vitamin E brought about improvement in cases of muscular dystrophy. This was manifested by gain in muscle strength, disappearance of fatigue and muscle pain upon slight exertion, changes in muscle texture and replacement of dystrophic muscle by normally contracting muscle tissue.

SHELDON et al. failed to find any benefits derived in treating neuromuscular diseases with vitamin E.

1941 STEINBERG treated 30 cases of primary fibrositis successfully with natural mixed tocopherols.

DENKER, DE JONG, FERREBEE, WORSTER-DROUGHT, and FITZGERAND, separately, confirm Sheldon's failure relative to the efficacy of vitamin E therapy in neuromuscular diseases.

STAHLER determined clinically that vitamin E augments the action of estrogens.

1942 HAWKE could find no benefit from administering tocopherols plus pyridoxin to patients with amyotrophic lateral sclerosis.

STONE considered vitamin E plus various B-vitamins helpful in treating tabes dorsalis.

STEINBERG showed that gamma-tocopherol is as effective as alpha- in curing primary fibrositis characterized by aching limbs, fibrillar nodules on arms and legs near the joints and creatinuria.

1943 BUSKIND reported that vitamin E therapy in conjunction with vitamin B-complex administration improved fertility and sperm motility in 12 male subjects.