

A NEW PHARMACODYNAMIC EFFECT  
OBTAINED THROUGH THE USE OF  
AMINO ACID COMBINED WITH  
VITAMIN B COMPLEX

- By Max Jacobson, M. D.

This is a report on clinical and research work describing how a combination of amino acid with vitamin B complex not only increases immeasurably the effect of the vitamin B complex itself, but achieves an extraordinary degree of synergistic action as well.

THE WORKING HYPOTHESIS

In observing the effects of vitamin B complex on various stages of vitamin deficiency, two limitations became evident:

- (1) In many cases, the state of vitamin deficiency did not improve, nor did the accompanying clinical symptoms; and
- (2) The maximum coordination of effects upon, as well as within, the nerve cells could not be obtained simultaneously.

Since it had been the experience of the writer with cases of fatigue and anemia that extremely outspoken indications of fatigue could be accompanied by completely normal blood counts, it suggested that the central nervous system was more directly the cause of these symptoms. On the other hand, secondary fatigue or secondary anemia is accompanied by a lower blood count, indicating a decreased hemoglobin and red cell count and, consequently, a decreased oxidation. Thus, it became the considered

opinion of the writer that primary or nervous fatigue is caused through a direct involvement in the metabolism of the nerve cells, whereas secondary fatigue is a cell disturbance of the nervous system resulting from decreased oxidation. From this it would seem that if the vitamin B complex were to fully and effectively combat all forms of fatigue, it should be able to coordinate and activate both the oxidation of the blood cells and the metabolism of the nerve cells at one and the same time.

It is known that the effect of an activating protein upon vitamins closely resembles the biological condition produced by vitamins in enzymatic reactions. It was reasonable to conclude, therefore, that selective research would lead to a combination of amino acids and vitamin B complex which would increase the natural biological effect produced by the vitamins alone.

Since the selection of an amino acid was necessarily limited (especially for parenteral use) in order to avoid unfavorable reactions, the final choice was histidine, because -

- (1) It counteracts the derangement between the autonomic and sympathetic nervous systems, creating balance in the vegetative system;
- (2) it furnishes a similar effect on the vasomotory reflexes, and
- (3) it possesses definite anti-allergic qualities.

In order to include all the advantages of the histidine, I devised a formula for the concentration of 5 mg. riboflavin in

a 2 CC ampule.\* My purpose was not to attempt to replace or furnish any additional supply of amino acids but to achieve detoxification by restoration of normal functions in the vegetative nervous system and liver metabolism. With respect to the detoxifying effect, this was of particular importance since the cell oxidation is believed to rely especially upon the yellow enzyme and its co-enzyme, riboflavin. The concentrate of riboflavin, in addition to the amino acid-vitamin B complex, furnishes a particularly strong impulse on the oxidative system. Thus, the detoxified nervous system is enabled to utilize the fullest advantages of the local cell improvement achieved by the vitamin B complex. \*\*

In the beginning it was decided to apply the new compound intramuscularly only. Throughout controlled experiments, in every case of nervous fatigue and secondary anemia encountered, the return of the hemoglobin and red cell count to the upper limit of the normal level was extremely prompt, ranging from twenty-four hours to three days. \*\*\*

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\* The formula for the ampule has already been submitted.

\*\* It is not the intention of the writer to enlarge this resume by discussing all the known facts of vitamin B complex action on the human organism.

\*\*\* Clinical experience reveals beyond question that this is a true improvement of the blood count and not a temporary increase such as that produced by adrenalin, ephedrine or benzedrine.

Then the new compound was given intravenously and demonstrated the same effect to a more pronounced degree and in an even shorter time, for after one intravenous injection symptoms of nervous fatigue and secondary fatigue disappeared completely and instantaneously and there was an immediate improvement in the red blood count. The form and speed of this reaction definitely rejects the probability of any theory that the effect obtained might be merely an incident of protein reaction.

The final step was to produce similar results through oral medication. There is a difference between the ampule and the capsule. The capsules are being used in less acute cases and also to supplement the effect of the injections. The combined use of ampule and capsule supplies a much greater variety of amino acids than could be used in injection form only without risking unfavorable reaction. The oral medication contains glutamic acid hydrochloride and has the additional advantage of embodying the whole filtrate factor of vitamin B complex. Glutamic acid hydrochloride was selected because it is metabolized by brain tissue. Choline,\* part of the vitamin B complex, plus ascorbic acid, ranges in detoxifying action with amino acids of similar potency.

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\* Choline is reported to have a strong effect on the fat metabolism and, consequently, on the absorption and utilization of fatsoluble vitamins.

Comparative tests were made to establish the difference between the effects derived from the compound and those produced by the sole application of vitamin B complex. In every test, response to the new compound was immediate, and its total effectiveness vastly superior. It should be borne in mind that these effects are not the result of stimulation but, rather, a coordination that produces a comfortable relaxation while creating a source of renewed energy. The treatment, of course, must be continued over a period of time in order to supply lost or depleted energy reserves and maintain a balancing influence on the central nervous system, thereby insuring permanence.

#### CLINICAL RESEARCH

My personal clinical research was based on cases of secondary anemia, patients recovering from infectious conditions, nervous exhaustion, pregnancy anemia, trigeminal neuralgia and arthritis.

Other clinical research work has been done at St. Peter's General Hospital, New Brunswick, N.J., by Dr. Rosenthal; Presbyterian Hospital, New York, by Dr. Damon; Bellevue Hospital, New York, by Dr. Lehfeldt, and New York City Cancer Institute by the writer in cooperation with Dr. Nelson and Dr. Stein.

In addition, we have reports on audiometer tests performed on patients hard of hearing at the Polyclinic Hospital,

New York. These tests confirmed our general impression of improved coordination resulting in quickened reception and response in the various sensory organs, as a direct consequence of the new compound. Although the detailed report on this development will be submitted at a later date by the special staff conducting these tests, I might mention here that a close study of the accepted treatments of otosclerosis, even in conjunction with vitamin B usage, over a period of one or two years, does not reveal results comparable with the improvement reflected after our experiments. Treatments entailing the use of vitamins alone (B, B1 and B complex) produced no effects similar to those observed in our tests.

There are also new developments in the use of this compound on cancer patients. The attached report from City Hospital, Welfare Island, on experiments with patients in late stages of cancer, shows only the effect of the compound on the blood count, but there was also a remarkable general improvement cited in cases of extreme emaciation. It can be stated conclusively, from the records of all these cases, that with rare exception a rapid improvement in the blood count resulted. This improvement was especially striking in cases of pregnancy\* and secondary anemia which had failed

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\* Longevity depends largely upon a sufficient vitamin supply during pregnancy, as stated in latest research reports.

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to respond to other efforts. The ommicellular stimulation was evidenced by an increase of appetite and a disappearance of physical and nervous exhaustion symptoms.

The initial purpose of the compound was that it be used to effectively combat fatigue. It might be of interest to point out that it was during the course of the varied clinical experiments that the broader scope of its benefits became evident and was proved beyond doubt.

#### SCOPE OF POSSIBILITIES IN THE USE OF THIS COMPOUND

From the outset my aim has been to offer this new compound as a remedy against the multitudinous effects of war fatigue. Since the submission of my original report to the National Research Council, and up until the time of this writing, my experience with this compound comprises approximately 6,000 injections and the distribution of about 100,000 capsules. In every case - both individual and group - I have received complete confirmation of the previously obtained clinical results. Several group experiments now in progress (the first reports of which are extremely gratifying and the final records of which will be submitted upon their completion) add evidence of improved coordination, increased effort through lack of fatigue and resistance against minor respiratory infections, induced by this compound.

Countries which have been under the impact of nutritional deficiency, and whose engagement in the war effort



dates beyond our own, illustrate clearly the precautions we must take as our own participation lengthens. Fatigue is represented to be the most serious impediment to the progress of war production both in England and Russia, by the admission of those countries' leading physicians. Naturally, a B complex deficiency is a condition from which pilots, bombardiers, infantrymen and servicemen in every other vital branch of war duty, are not immune. It is also the natural aftermath of life raft exposure (general debility and immersion foot).

Not only does the new compound present an answer to fatigue on the production line, but it could also be utilized to tremendous advantage in counteracting the strain experienced in the course of modern technical warfare; for example, in the treatment of shock through burns, concussion and symptoms of various other origins, all of which have been stressed as major problems during the last conference of military surgeons.