

1-1-1983

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### Recommended Citation

Savetamal, Lumduan (1983) "Pellagra and Vitamine B6," *The Thai Journal of Pharmaceutical Sciences*: Vol. 8: Iss. 4, Article 8.

Available at: <https://digital.car.chula.ac.th/tjps/vol8/iss4/8>

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BROAD SPECTRUM

## Pellagra and Vitamine B<sub>6</sub>

Lumduan Savetamal\* M.S.

Pellagra in North Spain was described by Casel in 1735, but for many years it was more commonly found in Italy, France, the Balkans, Roumania and Egypt. Dermatitis, diarrhea, dementia and death were the terms most used by the numerous writers who described pellagra for almost two centuries, proponent of the cause of the disease was unable to prove.

Between 1905-1910 there was an explosive outbreak of pellagra in the United States, principally confined to the Southern States, medical opinion was about equally divided on the "corn poison" and the *infection theory*.

Goldberger and his associates (1915) investigated the incidence of the disease and character of the diet given to the patients, medical and nursing staff in State Asylums in South Carolina, Georgia, and Mississippi; they were soon convinced that pellagra was a disease caused by malnutrition.

In Mississippi when pellagra was rampant among the children of 6-12 years of age, Goldberger and his associates were able to eradicate the disease in an orphanage by providing liberal amount of milk, meat and eggs in the diet. They concluded that pellagra is a deficiency disease rather than one due to poisoning or to injection.

Goldberger and his associates carried out an experiment on human subjects, eleven adult male prisoners in the Rankin Farm Prison in Mississippi, to take diet consisted of bolted wheat flour, degerminated cornmeal (maize), polished rice, starch sugar, molasses, pork fat, sweet potatoes, collard, turnip green and coffee, for six-month period. The men developed certain symptoms of pellagra and responded to treatment with dietary supplements of 30 grams of yeast, 200 grams of meat and 2 pints of milk daily.

In 1916, T.N. Spencer, a veterinarian of Concord, North Carolina, first called attention to similarity between human pellagra and black tongue in dogs.

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In 1920, Voeg, Neill and Hunger discovered that pellagra could be cured by daily dose of 15-30 grams of dried yeast, or by 25 grams of water extract of yeast.

In 1925, Goldberger and Tanner reported that there existed an unknown specific dietary factor, at high level in yeast, lesser in lean meat and milk, smallest amount in peas and beans. Butter and cod liver oil were found to be of no value. They believed that yeast extract contained the curative factor.

A year later, Goldberger and Lillie produced in rat a disorder which they diagnosed as rat pellagra. A further complication of the pellagra story developed in 1927 when Boas described a syndrome in rats fed with raw Chinese egg white as a source of protein.

By the year 1930, it was well-known that an adequate diet must provide us the adequate inorganic elements, a source of glucose, an unsaturated fatty acid, the fat soluble vitamin A, D, E and K, and water soluble factors, thiamin, riboflavin and Vitamin B<sub>6</sub> was first defined by Gyorgy (1935) as that part of the vitamin B complex responsible for the even of a specific dermatitis developed by rats on a vitamin free diet supplemented with vitamin B<sub>6</sub> and riboflavin. Hence the vitamin was first identified as the rat antidermatitis factor. Alopecia (loss of hair) is also a commonly observed symptom of the vitamin B<sub>6</sub> deficiency in rats.

The vitamin B<sub>6</sub> alcohol, pyridoxine, was first isolated by Kerestezy and Stevens (1938) and later in the same year by the others? (independent groups) including Gyorgy (1938) and Lepkovsky (1938).

Synthesis of the vitamin was accomplished in the following year by Harris and Folkers (1939). It was not until 1945, that the other compounds identified as pyridoxal and pyridoxamine were established by E.E. Snell. The active form of the vitamin, the coenzyme-pyridoxal phosphate, was identified by Umbreit and Grunsalus in 1945. Pyridoxal phosphate was required for many specific reactions of individual amino acid and was identified as a coenzyme for phosphorylase by Cori and Illingworth 1957.

Vitamin B<sub>6</sub> has also been implicated in metabolic system in which mechanism of action was not clear,

1. It has been suggested by Wirren and Holman since 1952 that vitamin was essential for conversion of linoic to arachidonic acid.

2. A number of genetic diseases involving vitamin B<sub>6</sub> dependent enzyme systems have been reported by Gyorgy since 1971.

3. The effect of oral contraceptive pills on vitamin B<sub>6</sub> requirement and on metabolic changes in females have been reviewed by Mason *et al* and others since 1969.

4. Mc Coy and Columbini have presented evidence that marijuana affected vitamin B<sub>6</sub> interconversion in brain since 1972. The action was not known.

As it has been described that metabolic role of vitamin B<sub>6</sub> was not clear, it opens various area of researches which may be importance in answer the current questions.

1. In many developing countries, oral contraceptive is used as a mean to control over population, in other hand, as a mean to solve malnutrition problem. Changes in vitamin B<sub>6</sub> level in women has been reported. The question is arising if serotonin, a tissue hormone, is lower in brain that causes mental complaints among the patients. This may lead to mental disorder as it has been reported relation of pyridoxine and behavior and schizophrenia and other CNS diseases.

2. Pyridoxine and hypertension in relation to the renin-angiotensin system is also interesting challenge, because hypertension coronary heart diseaes and artherosclerosis is now being in attention.

3. Dietary B<sub>6</sub> in metabolism of sulfur-containing amino acid that gives rise to taurine, a bile acid compound, its level is feed back mechanism to control cholesterol biosynthesis.

4. Un saturated fatty acid and vitamin B<sub>6</sub> may reveal aging mechanism.

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