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Vitamin B_{17}/Laetrile/Amygdalin (a Review)

Marinela ENCULESCU

Research & Development Institute for Bovine Breeding–Balotesti
Sos. Bucuresti-Ploiesti, km. 21, Ilfov, 077015 Balotesti, Romania
marinelaenculescu2006@yahoo.com

Abstract. Vitamin B_{17} is a natural substance whose anti-cancer properties have been known empirically for many years, but in the last twenty years they have been scientifically proven. It was co-discovered by Ernst T Krebs, Jr. in 1952 called it Laetrile. Vitamin B_{17} is found in the seeds of those fruits in the *Prunus rosacea* Family (bitter almond, apricot, cherry, nectarin, peach and plum). It is also contained in grasses, maize, sorghum, millet, cassava, apple seeds and many other foods. Dr Krebs and other researchers maintain that cancer is a chronic metabolic disease, like scurvy or pellagra. This review contains the mechanism of action by vitamin B_{17} and anticancer activity to humans and animal.

Keywords: cancer, apricot of kernels, rhodanese, beta-glucosidase, pancreatic enzymes, trophoblast cell

INTRODUCTION

Vitamin B_{17}/Laetrile/Amygdalin is one of the most controversial vitamin in the last 30 years. It is simply a concentrated form of Nitriloside There are 3 names which are interchangeable being Vitamin B_{17}, Laetrile and Amygdalin. Vitamin B_{17} was extracted from the kernels of apricots by a biochemist named Ernst T Krebs Jr. He also called it Laetrile which is simply short for **Lae**vo-mandeloni**trile** and was awarded its vitamin status officially in 1952. But the systematised study of Vitamin B_{17} has begin when the chemist Bohn (1802) discovered that during the distillation of the water from bitter almonds hydrocyanic acid was released. In 1830 two French chemists, was isolated a crystalline amygdalin from the bitter almond, Amygdalus communis Linnaeus, now known as Prunus amygdalus Batsch, of the rose family Rosaceae (Robiquet and Boutron, 1830). Either way all 3 are essentially the same thing. Antitumour action was known empirically for many years, but in the last thirty five years has been scientifically proven by more researchers with equally impeccable credentials (Griffin, 1974). Various documents from the oldest civilizations such as Egyptat the time of the Pharaihs and from China 2.500 years before Christ mention the therapeutic use of derivatives of bitter almonds. Egyptian papyri from 5000 years ago mention the use of aqua amigdalorum for the treatment of some tumours of the skin (Contreras, 1980). The Greeks and Romans also attributed therapeutic properties to that extract in low doses. Chemically, it is cyanogenic diglucoside, with a condensed formula $C_{20}H_{27}NO_{11,}$ with a molecular weight of 457,42g $moll^{-1}$, a chemical name of D (1) Mandelonetrile-betaglucoside-6 beta-D-glucoside (J. Yan et al., 2006). Vitamin B17 had the following formula:

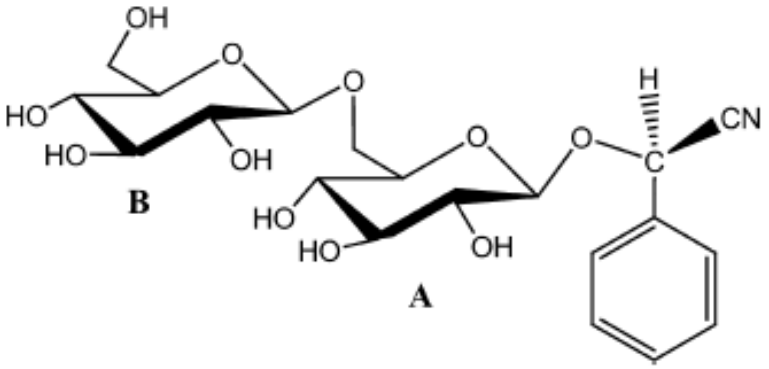

Fig. 1. Chemical structure of amygdalin

Foods that contain vitamin B_{17} (June de Spain, 1976) are as follows:

- *Kernels or seeds of fruit:* The highest concentration of vitamin B_{17} to be found in nature, aside from bitter almonds, apricot, apple, cherry, nectarine, peach, pear, plum etc;
- *Beans:* broad (Vicia faba), burma, lentils (sprouted), lima, mung (spruted), rangoon;
- *Nuts:* bitter almond, macadamia, cashew;
- *Berries:* almost all wild berries-blackberry, chokeberry, christmas berry, cranberry, elderberry, raspberry, strawberry;
- *Seeds:* chia, flax, sesame;
- *Grasses:* acacia, alfalfa (spruted), wheat grass, white dover.
- *Grains:* oat groats, barley, brown rice, buckwheat groats, millet, sorghum, rye, wheat berries;

There are isolated tribes and peoples around the world who do not have cancer. These include the Abkhazians, the Hopi and Navajo Indians, the Hunzas, the Eskimos and the Karakorum. They have in common a diet rich in vitamin B_{17}.

HOW VITAMIN B_{17} KILLS CANCER?

According to research conducted by Ernest T. Krebs Jr. the mechanism of action is following: our body has one particular enzyme called Rhodanese found everywhere in the body except at the cancer cells, and the enzyme Beta-Glucosidase found in very large quantities only at the cancer cell but not found anywhere else in the body. If there is no cancer in the body there is no enzyme Beta-Glucosidase. Vitamin B_{17} is made up of 2 parts glucose, 1 part Hydrogen Cyanide and 1 part Benzaldehyde (analgesic/painkiller). When B_{17} is introduced to the body, it is broken down by the enzyme Rhodanese. The Rhodanese breaks the Hydrogen Cyanide and Benzaldehyde down into 2 by-products, Thiocyanate and Benzoic acid which are beneficial in nourishing healthy cells and forms the metabolic pool production for vitamin B_{12}. When the B17 comes into contact with cancer cells, there is no Rhodanese to break it down and neutrelise it but instead, only the enzyme Beta-Gucosidase is present in very large quantities. When B_{17} and Beta-Glucosidase come into contact with each other, a chemical reaction occurs and the Hydrogen Cyanide and Benzaldehyde combine synergistically to produce a poison which destroys and kills the cancer cells (fig. 2). This whole process is known as selective toxicity. Only the cancer cells are specifically targeted and destroyed (Griffin, 1974).

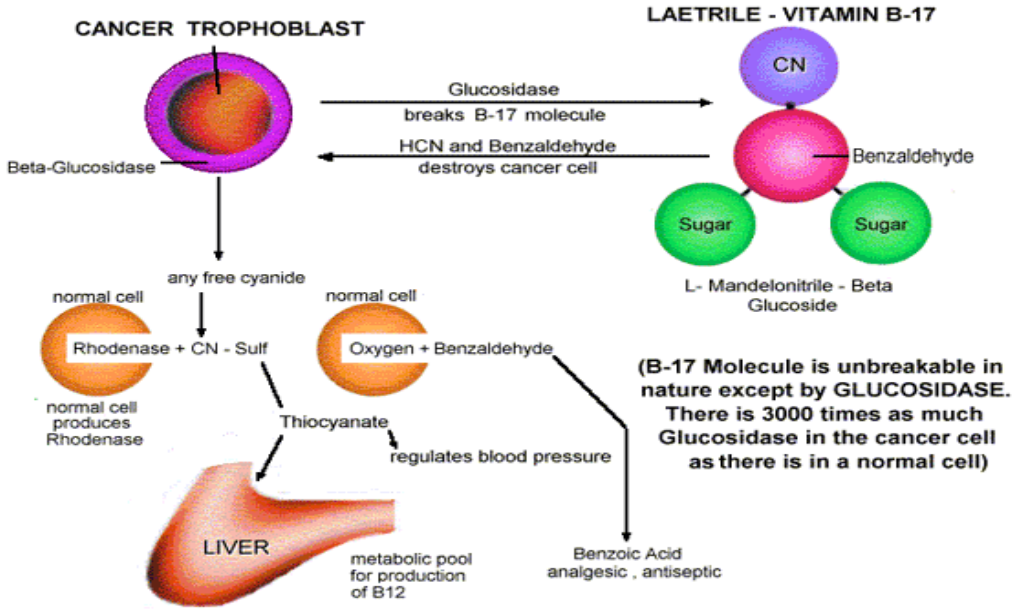

Fig. 2. Action of Laetrile in Cancer (by Ernest T. Krebs Jr.)

Zinc is the transportation mechanism for laetrile in the body. Biochemists and researchers has found that patient did not have sufficient level of zinc, the laetrile would get into the tissues of the body. They also found that magnesium, selenium, vitamin A, B and vitamin C all played an important part in maintaining the body's defence mechanism. (Binzel, 1994) The cancer is best treated with a total nutritional program consisting of diet, vitamins, minerals, laetrile and pancreatic enzymes (Manner et al., 1978). Pancreatic enzymes form the first layer of defence the body has against cancer.

CANCER AETIOLOGY

It has been shown that cancer cells are exactly the same as pre-embryonic cells that are found in pregnancy. These normal cells in pregnancy are called trophoblasts (Beard, 1905; Griffin, 1974 and Krebs et al., 1950). Trophoblast cells are also thought to be involved in the healing process. These are formed as a result of a chain reaction starting with another cell identified as the diploid totipotent, which contains within it all the separate characteristics of the complete organism and has the total capacity to evolve into any organ or tissue, or indeed, into the complete embryo itself. About 80% of these trophoblast cells are located in the ovaries and testes serving as a genetic reservoir for future offspring. The rest of them are distributed elsewhere in the body for a purpose not yet fully understood but which may involve the regenerative or healing process of damaged or ageing tissue. Whenever the body is damaged, either by physical trauma, chemical action, or illness, oestrogen and other steroid hormones always appear in great concentration, possibly serving as stimulators or catalysts for cellular growth and body repair. The diploid totipotent cells are triggered into producing trophoblast cells when they come into contact with these steroid hormones. When this happens to those diploid totipotent cells that have evolved from the fertilised egg, the result is a placenta and umbilical cord, a means of nourishing the embryo. But when it occurs non-sexually as a part of the healing process then cancer is produced if the healing process is not stopped upon the completion of its task. When cancer begins to form, the body reacts by

attempting to seal it off and surround it with cells that are similar to those in the location where it occurs. A bump or lump is the initial result. Usually the efforts of the body to control the centre of the trophoblast are successful, the trophoblast dies, and a benign polyp or other benign tumour remains over cancer. Under microscopic examination, many tumours are found to resemble a mixture of both trophoblast and surrounding cells; a fact which has led some researchers to the premature conclusion that there are many different types of cancer. But the degree to which tumours appear to be different is the same degree to which they are benign; which means that it is the degree to which there are non-cancerous cells within it. The greater the malignancy, the more these tumours begin to resemble each other, and the more clearly they begin to take on the classic characteristics of pregnancy trophoblast.

The body's first line of defence. All animals contain billions of white blood cells, whose function is to attack and destroy anything that is foreign and harmful to our bodies - people who develop a low white-blood count become susceptible to infections of all kinds. It would seem logical therefore, that white blood cells would attack cancer cells. However, cancer cells are not foreign to the body, they are a vital part of the life cycle - in pregnancy and healing. Consequently nature has provided them with an effective means of avoiding the white blood cells. One of the characteristics of the trophoblast cell is that it is surrounded by a thin protein coating that carries a negative electrostatic charge. The white blood cells also carry a negative charge. And, since like polarities repel each other, the trophoblast is well protected. The blocking factor is nothing more than a cellular electrostatic field. Part of nature's solution to this problem, as pointed out by Professor Beard (1905), is found in the ten or more pancreatic enzymes, of which trypsin and chymotrypsin are especially important in trophoblast destruction. These enzymes exist in their inactive form (as zymogens) in the pancreas gland. Only after they have reached the small intestine are they converted to their active form (it is significant that the small intestine, near the point where the pancreas empties into it, is one of the few places in the human body where cancer is almost never found). Then these are absorbed into the blood stream and reach the trophoblast, and they dissolve the negatively-charged protein coat. The cancer then is exposed to the attack of the white cells and it dies. In pregnancy, the trophoblast cells in the normal embryo continue to grow and spread right up to the eighth week. Then suddenly, they stop growing and are destroyed. It is in the eighth week that the baby's pancreas begins to function. So it would seem that the first line of attack against cancer cells is the presence of sufficient quantities of pancreatic enzymes which digest the protective coating surrounding the cancer cells and expose the trophoblast to the destructive force of the body's white blood cells. *The second line of defence is formed by vitamin* B_{17}.

HUMANS LAETRILE TESTS

Manuel Navarro (1957, 1971) during the eighteen year period he has treated a total of over five hundred patients in a terminal state with Laetrile useng by various routes of administration, including the oral and the intravenous. He has obtained most significant and encouraging results with the use of Laetrile and that these results was comparable or superior to the results he has obtained with the use of the more toxic standard cytotoxic agents. The types of cancers treated included adenocarinoma of the breast, stomach, lungs, tongue, larynx, nasopharynx, rectum, colon, liver, esophgus, thyroid, uterus, hodgkins, lymphorcomas, fibrosarcomas, etc.

P.E. Binzel (1994) published his results from treating cancer patients with Laetrile between 1974 and 1991. He used a combination of intravenous and oral Laetrile. Intravenous

doses started with 3 gms and worked up to 9 gms. After a period of months, oral Laetrile, 1 gm at bedtime, was begun in place of the injections. Binzel also used various nutrient supplements and pancreatic enzymes, as well as a low animal-protein, no junk-food diet as part of his regimen. Out of a series of 180 patients with primary cancer (non-metastasized, confined to a single organ or tissue), 138 were still alive in 1991 when he compiled his treatment results. At that time, 58 of the patients had been followed for 2 to 4 years, while 80 had a medical follow-up from 5 to 18 years. Of the 42 patients who had died by 1991, 23 died from their cancers, 12 from unrelated causes, and 7 died of cause unknown.

Ernesto Contreras (1980) remarks that for the prevention of cancer and the maintenance of remission, there is nothing as effective as Laetrile. Its nontoxicity permits its use indefinitely while surgery, radiation and chemotherapy can only be administered for a limited time. He reported excellent results using Laetrile in conjuncion with Vitamin A and enzymes.

Michael Schachter, who has used Laetrile for 20 years with cancer patients, recommends using cysteine (N-acetyl cysteine is a better-absorbed form of cysteine) along with amygdalin, to maximize the body's ability to detoxify any cyanide released from the Laetrile (Griffin, 1974).

ANIMAL LAETRILE TESTS

Anticancer activity by Laetrile in animal tumour systems has been observed in at least 5 independent institutions in 3 widely separated countries of the world, with a variety of animal cancers (Burk, 1974):

1. Southern Research Institute (Birmingham Alabama), for the NCI, in a majority of 280 BDF1 mice bearing Lewis lung cancers, treated with up to 400 mg Laetrile (Amygdalin MF) per kg body weight, with respect to increased median life span (Dec 3, 1973).
2. Sloan Kettering (New York) with CD8 F1 mice bearing spontaneous mammary carcinomas, inhibition of formation of lung metastases, inhibition of growth of primary tumours, and greater health and appearance of animal hosts, upon treatment with 1-2 gm Laetrile/per kg body weight/day (June13, 1973).
3. Scind Laboratories, University of San Francisco, 400 rats bearing Walker 256 carcinoma (200 treated with Amygdalin, 200 controls), with 80% increase in life span at optimum dosage (500 mg Amgdalin/kg body weight). (Oct 10, 1968).
4. Pasteur Institute (Paris), with human cancer strain maintained in mice, treated at optimal dosage of 500 mg Amygdalin Marsan/kg body weight/day, increased life span and delayed tumour growth up to 100% (Dec 6, 1971).
5. Institute von ardenne (Dresden, Germnay), H strain mice bearing Ehrlich ascites carcinoma treated with bitter almond amygdalin ad libitum in addition to regular chow diet, yielded increased life span and decreased rate of cancer growth, treatment beginning 15 days before cancer inoculation (arch. Geschwulstorsch 42, 135-7 (1973).

For five years, between 1972 and 1977 laetrile was meticulously tested at Sloan Kettering Cancer Centre in Manhattan under the direction of Dr. Kanematsu Sugiura. The results show that: laetrile stopped metastasis (the spreading of cancer) in mice, it improved their general health, it inhibited the growth of small tumours, it provided relief from pain, it acted as a cancer prevention.

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