Mechanism Action of Amygdalin as Natural Chemotherapy in Colon Cancer

Walaa Fikry Elbossaty*

Department of Chemistry, Biochemistry Division, Faculty of Science, Damietta University,

Damietta, Egypt

Review Article

*For Correspondence

Walaa Fikry Mohammed Elbossaty, Department of Chemistry, Biochemistry Division, Faculty of Science, Damietta University, Damietta, Box 34517, Egypt

E-mail: Walaafikry1985@gmail.com

ABSTRACT

Colon cancer is the most cancer types may lead to death. There were different risk factor increase the rate of colon cancer, these factors may include genetic, inherited, environmental, and life style factors. There were different strategies in treatment of colon cancer. Chemotherapy is one of important strategy in treatment of this disease; chemotherapy infusion has various side effects. The new trends in treatment of colon cancer using natural chemotherapy. Most studies assume that vitamin B17 has ability to killing the malignant cell, to prevent it from spreading in to other organs and this help in control on colon cancer, on the other hand healthy cells doesn't effect with this therapy. Some researches indicate vitamin B17 injection may be effect on healthy cells due to the toxic effect of cyanide which present in composition of vitamin B17, also, they found toxic effect of vitamin B17 can be released if take orally from its natural sources due to the action of gut bacteria. In this review we will discuss chemical composition, natural sources, mechanism action of vitamin B17; in addition to natural treatment of colon cancer.

Vitamin B17

Definition

Vitamin B17 is a glycoside nutrient which derived from natural food especially seeds of apples and apricots, lima beans, clover and sorghum. Vitamin B17 has various names as amygdalin or laetrile [1].

Sources of vit B17

Vitamin B17 is found in different sources, The value of vitamin B17 can be determine according to its concentration in different foods in to three groups; High if vitamin B17 concentration greater than 500 mgs per 100 grams food Medium if vitamin B17 concentration greater than 100 mgs. Per 100 grams food; Low if vitamin B17 concentration lower than100 mgs per 100 grams food. According to the Vitamin B17 Organization, the highest sources of vitamin B17 are listed in the following **Table 1** [2].

Pharmacokinetics of vitamin B17

As soon as vitamin B17 enters the body, it interacts with other antioxidants as vitamin A, vitamin C and vitamin E along with pancreatic enzymes to break down and eliminate harmful cells from the body [3]. The function of vitamin B17 may be result from the ability of amygdalin to give enzymes called glycosidase which responsible for release cyanide which killed the muted cells. Various researchers found that injection of amygdalin in animals slowed the growth of cancer and helped stop spreading of malignant cells into the lungs. In human amygdalin has shown anti-cancer activity due to release cyanide which killed the cancer cells in addition to the cyanide will also damage healthy cells [4].

Benefits of Vit B17

Table 1. Sources of vitamin B17.

Apricots	
Seeds of apples, peaches, pears	
Lima beans	
Fava beans	
Almonds	
Strawberries	
Black berries	

Vitamin B17 has different benefits which can be summarized in the following points:

Anti-cancer effects: Some researches is assumed that vitamin B17 is helpful in prevent spreading cancer cells and keeping it at minimum levels, avoiding cancer and keeping the spread of existing cancer cells to a minimum, on the other hand, others show no effects of vitamin B17 on cancer cells. Vitamin B17 has the ability to kill cancer cells through release cyanide more than killing normal, healthy cells [5].

Immunity action: Vitamin B17 provides boost and strength to immune system. It has ability to killing harmful cells and this slowdown the illness. According to study was published in the International Journal of Radiation and Biology vitamin B17 stimulated the immune system by stimulate the activity of white blood cells to attack harmful cells. Also, vitamin B17 act as a natural pain relief due to decreased swollen of lymph nodes and decreased tumor size [6].

Although many studies indicate that vitamin B17 safe for human, some information assume that vitamin B17 may be has toxic effects on long-term of high doses. Toxic effect of vitamin B17 result from releasing of cyanide which increase if the vitamin take orally due to intestinal bacteria contain enzymes that activate the release of cyanide found in vitamin B17, so it is recommended to take vitamin B17 as injection drugs this decrease the toxic effect of vitamin. The other recommendation to take vitamin from its natural food sources instead of vitamin supplements [7].

COLON CANCER

Definition

Colon cancer is the most cancer type's may lead to death. In the U.S., colorectal cancer represent as the third most common site of new cases suffers from cancer. It is predictable that 148,300 will be diagnosed per year and that about 56,600 Americans will die because colorectal cancer this year [8]. Most of researches estimated that about eighty percent of colon cancers occur in people with average risk of the disease, and about 20 percent occur in those at high risk, especially when a person of patients family have a history of colon cancer as in a mother, father, sister or brother. Colorectal cancer occurs more in people with age around 62 years, while the risk of developing colon cancer starts rising around age 40 [9].

Risk factors for colorectal cancer include family history with colorectal cancer, and inflammatory bowel disease. Other risk

factors include a sedentary life-style, diet with high fat and low fiber and inadequate ingestion of fruits and vegetables [10].

Signs and symptoms

Such as all cancer, early detection is vital. Colon cancer may exhibit no signs in its early stages. Gradually, as it progresses, any of the following may be noted: a change in bowel habits, diarrhea, constipation or a sense that the bowel is not empty, blood (either bright red, or dark) in the stool, abdominal discomfort, pelvic pain, weight loss for no apparent reason, constant tiredness and fatigue, anemia due to blood loss, and vomiting [11].

Diagnosis of colon cancer

Early diagnosis of colon cancer increase the rate of recovery from disease in addition to prevent the spreading of cancerous cells, diagnosis tools includes [12]:

1. The fecal blood tests although the result of this test may interference with other disease.

2. A sigmoidoscopy.

3. A colonoscopy, it is more expensive than the other procedures.

When any suspicious signs or symptoms are encountered, further testing might be done - often a double contrast barium enema (DCBE). If cancer is found, a biopsy is normally performed.

Additional tests that are available include [13];

1. Carcinoembryonic antigen (CEA) is a cancer marker.

2. DR-70.

3. Hemoccult; although this test may be a false positive if the person has recently consumed fresh fruits and vegetables, red meat, iron tablets or vitamin C tablets. Aspirin and other nonsteroidal anti-inflammatory drugs may also cause false positives.

4. PreGen-26 - a new DNA Test for Colorectal Cancer.

Stages of colon cancer

As soon as cancer of the colon is detected, more tests are done to find out if cancer cells have spread to other parts of the body (staging) - a surgical procedure is usually performed. Knowing the stage of the disease will assist in effectively planning of treatment [14].

The stages of colon cancer are summarized in the following points:

Stage 0 or carcinoma in situ

Is very early cancer - found only in the innermost lining of the colon.

Stage I

The cancer has spread beyond the innermost lining of the colon to the second and third layers and involves the inside wall of the colon, but has not spread to the outer wall of the colon or outside the colon.

Stage II

Cancer has spread outside the colon to nearby tissue, but it has not gone into the lymph nodes.

Stage III

Cancer has spread to nearby lymph nodes, but it has not spread to other parts of the body.

Stage IV

Cancer has spread to other parts of the body, such as the liver, bones, or lungs.

Recurrent

The cancer has come back (recurred) after it has been treated. It may come back in the colon or in another part of the body. Recurrent cancer of the colon is often found in the liver and/or lungs.

Colon cancer, if not treated, tends to become advanced and may develop into any of the following complications: Spinal cord compression, brain metastasis, bone metastasis, high calcium levels, pain, high uric acid, pleural effusion, and fluid in the abdomen.

Treatment of colon cancer

Surgery: The most common conventional treatment for colorectal cancer is surgery. Usually this involves the removal of the

primary tumor, part of the healthy colon or rectum, and nearby lymph nodes. Sometimes a temporary or permanent colostomy is required [15].

Chemotherapy: may be used, especially in later stages of colorectal cancer [16].

Radiation: is often used, even in early stages of rectal cancer. Some of the alternative approaches are discussed below [15].

Diet programs: such as Garson or Hallelujah diet.

Photodynamic therapy

Various supplements and herbal products: as Ellagic acid, shark cartilage or shark liver oil, high dose Vitamin C is often used.

Treatment of colon cancer by using vitamin B17

According to a study reported by Cancer Epidemiology Biomarkers and Prevention, people with a family history of colon cancer may be able to reduce their risk of developing the disease with a few simple dietary changes. It appears a diet high in folic acid, high in methionine (an essential amino acid), and low in alcohol intake, significantly reduced colon cancer risk in those with a family history of the disease [16].

Amygdalin-B17 is used as infusion therapies and in natural chemotherapies. Chemical composition of B17 consists of one molecule benzaldehyde (which is a painkiller) and one molecule hydrogen cyanide (cyanhydric acid). Healthy cells can not affected by this process due to they contain an enzyme called Rhodanese. This enzyme can convert cyanhydric acid (present within B17) into thiocyanate. Thiocyanate has positive effects on the organism as lowering the blood pressure and is precursor for B12. Benzaldehyde (present within B17) is transformed within healthy cells with the help of oxygen into the painkiller benzoic acid. On the other hand malignant cells will be death by the action of hydrogen cyanide in apoptosis process. This control on the growth of cancerous cells and prevents spreading of it to other organs **Figure 1** [17].
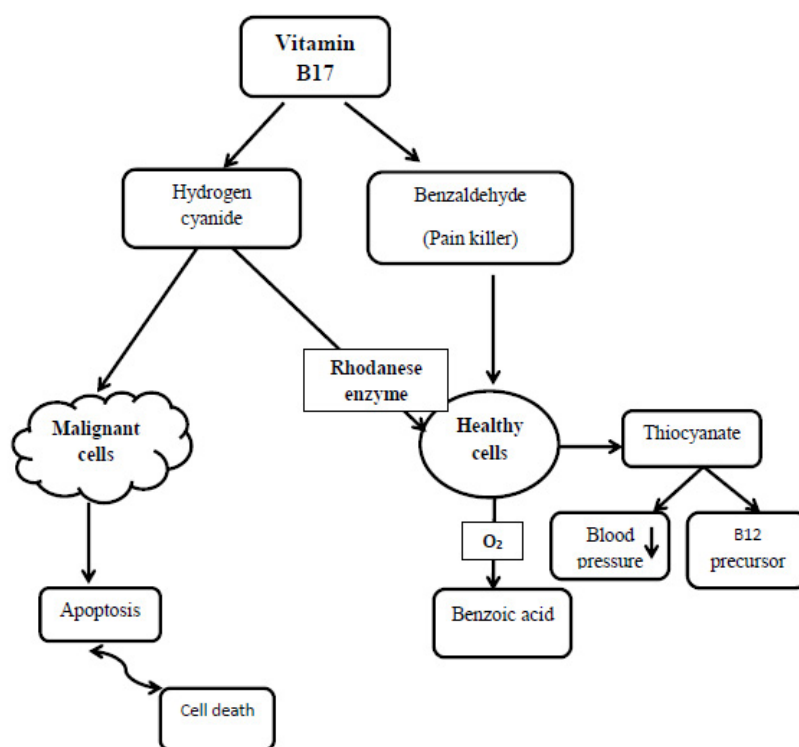

Figure 1. Mechanism action of vitamin B17.

CONCLUSION

Amygdalin, Laetrile or B17 is a natural substance, which found in apricot stones, while B17 is present in stones of peaches, cherries, plums or apples, buckwheat, broccoli, spinach, cauliflower or cashew nuts.

The characteristics of B17 lead to the conclusion that B17 can be appreciated as nutrition for healthy cells and a fatal for cancer cells. Once the therapy is modified to the natural regulation of our metabolism, it can be represents as a "natural chemo therapy". So, vitamin B17 acts as natural chemotherapy in colon cancer, in addition to protect the people whose have family history with colon cancer.

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