

**An Analysis with Vitamin-B-12 - A Cancer Vitamin**

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**Abstract**

Laetrile, semisynthetic form of amygdalin with a controversial history called by, cancer vitamin, vitamin-B17 that is widely promoted on the internet in many websites and social media as treatment for cancer grabbed my interest to search for possible scientific evidence and reports published on this vitamin-B17. Amygdalin with no proper clinical effective evidence and proofs on cyanide toxicity is until the day in popularity as anticancer vitamin and sold on line at expensive cost. Due to hydro cyanide group present in both amygdalin and laetrile they exhibit side effects as like cyanide poisoning.

**Keywords:** Vitamin,B-17, Amygdalin,Laetrile, US-FDA

**What is amygdaline/laetrile**

Amygdalin, first isolated in 1830 from bitter almond seeds (*Prunus dulcis*) by Pierre-jean Robiquet and

Antoine Boutrouin-charlard. Amygdalin is a cyanogenic glycoside found in plants belonging to family of *Prunus*. It naturally occurs in *Prunus* fruit, pips like apricot, bitter almonds, plum, raw nuts; it also is existed in clover, lima beans, and sorghum. Laetrile is a semi-synthetic form derived from Amygdalin. Laetrile (patented 1961) is an acronym derived from the terms laevorotatory and mandelonitrile<sup>[1-4]</sup>. Amygdalin/Laetrile

Both amygdalin and laetrile contain, mandelonitrile, which decomposes to benzaldehyde and hydrogen cyanide. Since 1950, several versions on developments of

Laetrile as anti-cancer drug, reported and published. It was theorized in 1962 as “cancer protein” in a book, Krebs, Sr., The term vitamin B-17 was given to laetrile by Ernst Krebs Jr, he also said, cancer caused due to deficiency of vitamin-B-17<sup>[5-7]</sup>. In the 1950s, Ernst T Krebs in the U.S. developed an apparently non-toxic, semi-synthetic intravenous form of Amygdalin to treat cancer.

In 1845, amygdalin used as cancer treatment in Russia and reported positive results in the first patient treated<sup>8, 9</sup>. In 1970’s laetrile gained importance as monotherapy for cancer and by 1978, in the United States, 70,000 people reportedly treated with Laetrile. With the buildup of many controversies around laetrile on ineffectiveness in cancer therapy and cyanide toxicity, US FDA has exempted it from approval.

**How does it acts as anticancer drug.....?**

Laetrile (containing amygdalin or benzaldehyde), as cancer remedy is controversial until the day due to lack of sound clinical evidence. However, proponents claim that amygdalin is selectively effective against cancer cells by below mechanisms.

Some hypothetical theories say that, laetrile readily delivered to cancer cell along with glucose. Cancer cells rich in  $\beta$ -glucosidases enzyme, hydrolyses laetrile to release cyanide and benzaldehyde forming a killing targeted poison that attack neoplastic cells.

Normal healthy cells are unaffected as they contain less  $\beta$ -glucosidases enzyme and high protective enzyme, Rhodanese (thiosulfate sulfurtransferase). Rhodanese found in healthy cells and lack in cancer cells, neutralizes hydrogen cyanide and benzaldehyde in to utilizable compounds thiocyanate (rhodanide) and benzoic acid.

Some theories say that cyanide toxicity is due to gut microflora because, Laetrile on oral ingestion is metabolized by alkaline duodenal and intestinal juice enzymes forming D-glucuronic acid and L-mandelonitrile. L-mandelonitrile is further hydrolyzed to hydrogen cyanide and benzaldehyde that cause cyanogenic toxicity. Hence, said that intra venous preparations of Laetrile are safe from cyanide toxicities<sup>10-11</sup>.

#### **Is it safe.....?**

On oral administration of laetrile/Amygdalin, intestinal microflora that releases cyanide from laetrile. Cyanide is a neurotoxin, causes serious adverse events, like, headache, dizziness, nausea and vomiting, dermatitis or, in severe cases, disturbed consciousness, tachycardia, respiratory distress, liver damage, coma and death. There are few evidence of case reports saying that intensity of cyanide toxicity increases with concomitant administration of vitamin-c, raw almonds, fruits or vegetables that contain beta-glucosidase (e.g., celery, peaches, bean sprouts, carrots).

Many cases reported on cyanide poisoning following ingestion of bitter almonds<sup>21</sup>. However, there are no proper evidences of cyanide toxicity on parenteral administration. Unfortunately, Laetrile is available as oral and intravenous, intramuscular preparations, and coming to treatment method, patients are treated initially for three weeks with intravenous or intramuscular injections followed by maintenance therapy with, oral administration of Laetrile<sup>[11-13]</sup>.

#### **Clinical evidences of amygdaline for its anti-cancer activity**

<sup>14</sup>In early 1970,'s a scientist named Dr. Kanematsu Sugiura, performed experimental tests on mice and claimed that laetrile effectively inhibited secondary tumors but has no effect on primary tumors. However, any scientist never reproduced the results after Dr. Kanematsu Sugiura.

#### **Conclusion**

From the literature available from 1970's, there were no proven clinical effects on the use of Laetrile. In fact, all the studies highlighted cyanide toxicity. However, even today amygdalin is available in the market as oral preparations by naming as apricot seed powder. After many decades of clinical use of amygdalin in the field of alternative medicine to treat cancer, no sound clinical evidences were found on its anti-cancer activity.

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