

LAETRILE AMYGDALIN B17: What's all the fuss?

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No other treatment for cancer has created more controversy or captured the imagination of people seeking alternative treatments more than Laetrile/ Amygdalin/ B17.

This treatment has been understood to provide a unique mechanism for the treatment of cancer. Here is a substance which supposedly only attacks cancer cells leaving the body's immune system and organs intact.

According to the theory, cancer cells contain enzymes to enable the release of the cyanide group contained in Laetrile/ Amygdalin/ B17 into the cancer cell, thus killing them.

The normal cell in contrast, does not contain the necessary enzymes to enable the release of the cyanide and therefore escapes the toxin. The theory goes on to describe how Laetrile/ B17/ Amygdalin in complete form is non-toxic and excreted harmlessly as the enzymes capable of cleaving it are only found in cancer cells.

Conspiracy versus Quackery

If this were true we would indeed have a natural substance capable of saving lives and curing cancer. Some would have us believe that the reason this hasn't happened, is because of vested interests not wanting this treatment to become available at the expense of conventional treatments and their large corporate profits. This may be true, but there is a lot to be desired in the way researchers have described the synthesis of these substances and also their therapeutic mechanism. In short, there is skulduggery on both sides.

Both sides of the argument seem unwilling to understand the scientific information, of which there is plenty, to unravel the truth. Instead, the argument has centred on conspiracy versus quackery.

Federal Court Ruling

My introduction to the treatment known as Laetrile/ Amygdalin/ B17 came in November 1990. A woman with terminal lung cancer approached me with a request to administer a cancer treatment involving intravenous infusions of Amygdalin.

After agreeing to proceed we hit a big hurdle. She was denied permission by the Australian Federal Therapeutic Goods Department to import the substance.

With the help of Derryn Hinch and some unidentified supporters in Perth the importation refusal was tested in the Federal Court in Western Australia. She won! The court ordered the treatment to be administered at Sir Charles Gardener Hospital; in Perth. The proceedings delayed administration and she died within a week of receiving her first treatment.

The judgement centred around two points.

1. The rights of people in the terminal stages of illness to have the treatment of their choice, even if unproven, especially if none other was available. This gives the patient and his or her family greater peace of mind, knowing that they have the opportunity to try all possible options.
2. The government case against importing L/A/B17 was that it had no therapeutic value and was potentially toxic. However the court ruled that, if it had no therapeutic qualities, then it was out of the Therapeutic Goods' Department's jurisdiction.

The government had to respond. The Therapeutic Goods legislation was under review at this time and a new department was set up. The Special Access Scheme was born. This allowed patients to request untested and unregistered treatments to be imported and used under the scheme with the supervision of a registered medical practitioner. For this legislation to apply the patient must fall into Category A, a life threatening illness, and the substance must not be listed on the prohibited list. Guess where L/A/B17 was placed? On the prohibited list.

The up side of this is that doctors working in the area of complementary/ alternative medicine to use treatments that patients would previously have had to access by travelling to distant parts of the world.

In the year 2000, ten years later, the rules changed. With a special permit issued by the TGA, L/A/B17 could be imported under the existing Special Access Scheme rules. This meant that L/A/B17 could be legally administered in Australia for the first time for Category A patients.

New Information reveals two chemically different substances

We can be grateful for organisations such as The Wellness Centre in Cottesloe, WA, independent from the government and medical hierarchies, giving information through their newsletter. The Wellness Centre provides a fresh perspective on many current therapies. An article in the August 2002 edition caught the eye of one of my patients. She alerted me to the article written by Don Benjamin, convenor of the CISS organisation in NSW. Benjamin is a writer who has a reputation for seeking out the truth about cancer therapies. He has written extensively on the poor performance and negative effects of chemotherapy and radiotherapy in certain cancers, which were downplayed in articles and reviews.

The article is named *Laetrile the drug that never was*. To summarise:

1. Laetrile and Amygdalin/ B17 are two chemically different substances
2. There is a scientific rationale for the use of Laetrile in cancer, with an understandable and valid mechanism of action.
3. Cyanide is cleaved from Laetrile by a different enzyme than that cleaving cyanide from Amygdalin/ B17.
4. The enzyme B- Glucuronidase which removes the cyanide molecule from Laetrile is present in varying amounts in certain types of cancer cells.
5. The enzyme glucosidase is responsible for the removal of cyanide from Amygdalin/ B17 but there is no evidence of the presence of this enzyme in any types of cancer cells,

I set about researching and validating this information. Here are the facts as I have come to know them:

Laetrile and Amygdalin/ B17 are in fact two chemically different substances. On the one hand there is Laetrile as described by Dr Krebs senior in 1940, a semisynthetic substance. On the other, we have Amygdalin/ B17 an extract from plants containing natural cyanides, of which the apricot kernel is just one.

A scientific paper giving a detailed analysis of the chemical difference between the two substances was published in the magazine *Science*, vol 198, 1977. by Catherine Fenselau et als., from John Hopkins University, Baltimore.

The difference lies not in the cyanide as both contain a cyanide molecule, but rather in the number of molecules attached to the cyanide molecule. Laetrile contains one whereas Amygdalin/ B17 contains two ring shaped sugar molecules.

This point may not seem important to some protagonists of the therapy, however, in the biochemistry of the body this is extremely important. The enzyme required to cleave cyanide from one ring shaped sugar molecule (B-Glucuronidase) are different from the enzyme required to cleave cyanide from the two ring shaped sugar molecule (Glucosidase) as previously stated by Don Benjamin.

For this therapy to be active in the way the theory has indicated the cancer cells must contain the enzymes that enable the release of cyanide and this enzyme must not be present in healthy cells. This is where the confusion sets in.

An extract from a reputable textbook on oncology, *Cancer Principles and Practice of Oncology* 2nd Edition, pp2338 – 2343, sent to me by a senior doctor in the Therapeutic Goods Department, states that no enzymes in cancer cells are capable of cleaving the cyanide from the ring shaped sugar molecules. My research suggests this is incorrect.

A paper published in the *China Medical Journal* 1999, clearly confirms the production of B-Glucuronidase in laboratory cultures of colon cancer cells. This paper outlines the principle that, the more aggressive the cancer cells are, the more B-Glucuronidase the cells produce. Other papers support this with reports that B-Glucuronidase is produced in cancers of prostate, lung, stomach, colon and breast along with melanoma and glioblastoma multiforme.

What about the enzyme, glucosidase? Phillip Day in his book *Why we are dying to know the truth* states that cancer cells produce 3,000 times as much glucosidase as normal cells. Is there any scientific evidence for this statement? Like Don Benjamin before me, I could find no scientific paper supporting this statement! Glucosidase however is found in the digestive tracts of some humans, supporting the theory that if you eat large amounts of nitrilosides (cyanide-containing foods) you may release cyanide into your gut, which can lead to cyanide in the blood stream and toxicity.

So, of the two substances, Laetrile looks like it has the credentials to kill cancer.

What is the status of Laetrile now?

Back in 1977 the researchers Fenselau et al (*Science*) had trouble obtaining samples of the substance Laetrile. Unable to obtain the original Laetrile, they tried to

synthesise it by the method described in the Krebs patent, but to no avail. They then developed their own method, which they described as limited and difficult. Their method was too costly and complicated to produce commercial quantities of Laetrile.

Having synthesised samples of pure Laetrile, they set about seeing if any of the commercial products on the market contained Laetrile. Not surprisingly, the samples all contained Amygdalin/ B17, but no Laetrile.

Dr David Rubin, an Israeli physician, former biochemist and former chief medical officer to the Israeli Navy was the first to synthesise Laetrile in sufficient quantities to use in patient treatments. His first Laetrile was extracted from a goat's urine, from goats fed on apricot kernels. Later, in 1984, he took out a patent describing a less laborious process for manufacture.

In September 2002 I managed to track down Dr Rubin. I was keen to access the real thing.

“Oh, I don't use that anymore; we have moved on,” Dr Rubin's answered, “We have a new generation of glucuronides, much better.”

Why didn't he use the Laetrile? Here was a substance that had eluded me for so long and had all the theory working for it. Don Benjamin had stated that Dr. Rubin had had great success with it on a limited number of patients in Australia. Had something happened to restrict his ability to use it? I wasn't satisfied.

Cyanide – how it works

I had to wait until November 2003 when Dr Rubin visited me in Perth to understand the case against the use of cyanide. After successfully synthesising Laetrile, Dr Rubin tried it on many cancers and found the results, contrary to what had been stated by Don Benjamin, to be disappointing.

There was something in this theory that had been overlooked. To understand this we need to go back to the work of a German researcher in pre-war Berlin. Otto Warburg was awarded the Nobel Prize for his work on the energy production in a cancer cell. As the cancer becomes more cancerous, more malignant, more aggressive, it reverts to a more primitive way of making energy. It switches from the normal cell system called aerobic respiration where O₂ is converted to CO₂ in the cell, creating energy, to anaerobic respiration.

In anaerobic respiration glucose is converted to lactic acid. The more the cancer cell reverts to anaerobic respiration the more it produces the enzyme B-Glucuronidase. This is because the PH in the cell drops and the cell becomes more acidic. This means it will cleave more cyanide because of the increased activity of B-Glucuronidase. That is what is wanted, but there is one big catch! Cyanide is an aerobic respiratory cell toxin, damaging the way the cell produces energy from O₂ to CO₂. Cyanide does not seem to be overly toxic to anaerobic cells.

Having made this discovery, which in hindsight seemed so obvious, Dr Rubin didn't throw the baby out with the bathwater. The mechanism for killing cancer was still intact. The single ring sugar molecule would still be digested by the enzyme B-

Glucuronidase, and maybe a substance other than cyanide, that is toxic to anaerobic cancer cells, would have better success.

Glycosol was thus developed. In this substance a phenol replaced the cyanide and in a two-stage process inside the cancer cell it showed its ability to kill the cancerous cell without damaging the surrounding normal tissue.

Glycosol – how successful?

Glycosol is still in the early stages of development. As previously stated, the enzyme B-Glucuronidase is produced in some cancers and not others. Results from small clinical trials show success in cancers of breast, colon, melanoma, prostate and glioblastoma. The response rare in these trials has been reported between 63% prostate, 50% breast carcinoma, 40% melanoma, for combined partial and complete response.

Of particular interest, is Glycosol's effect in prostate cancer as there is very little treatment for late stage prostate cancer. Particularly when hormone therapy has failed, this therapy offers some hope. At this stage Glycosol is not registered in Australia, but can be obtained under the special access scheme.

What about the testimonials?

Where does this leave Amygdalin/ B17? What about all those testimonials?

Amygdalin does seem to have some effect in cancer. A study by Dr Ernest Contreras in Mexico seems to be an unbiased appraisal. In his study using metabolic therapy, a combination of enzymes, vitamins and Amygdalin given orally and intravenously, he reports a response of combined partial and complete response in late stage cancers at 11%. However, many more patients get a reduction in pain and improvement in well being for a limited duration. The treatment effect may go some way to explain the treatment's popularity. This probably justifies this therapy as a palliative treatment, for those with little hope. However in 2004, I think there are a plethora of other treatments that promise more.

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