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Anticancer Attributes and Multifaceted Pharmacological Implications of Laetrile and Amygdalin

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Abstract

Laetrile, known as vitamin B17, is often used interchangeably with amygdalin. Laetrile is a semi-synthesis product of amygdalin, whereas amygdalin is a naturally occurring substance in many plants. Both compounds have a nitrile functional group that, when activated by the intestinal enzyme β -glucosidases, releases hydrogen cyanide. The two compounds have been considered for a long time as alternative therapy for cancer treatment however, findings available in the literature are discordant on the real efficacy of laetrile/amygdalin for the treatment of cancer, often highlighting a negative benefit-risk ratio. In this regard, the study aimed to comprehensively analyze the scientific data on laetrile/amygdalin, with a special emphasis on their pharmacokinetics, underlying pharmacological properties, mode of action as a potent antitumor agent, and effect on human health. The results showed that there is no clear evidence on the efficacy of cancer therapy following laetrile/amygdalin administration, especially at the clinical trial level. However, the in vitro studies of the biological activity of these compounds showed positive effects related to their antifibrotic, anti-inflammatory, antiasthmatic, and immunoregulatory processes. Laetrile's mechanism of action closely resembles amygdalin, affecting cancer signaling pathways. However, due to its cyanide toxicity, it was banned by the food and drug administration (FDA) due to safety concerns. Despite not receiving permission from the FDA, laetrile emerged as an alternative therapy in the 1970s. Nonetheless, continuing research is investigating safer methods of activating Laetrile for targeted cancer treatment. This opens interesting prospects in using these compounds in alternative medical therapies, for which, however, further research is needed.

Keywords: amygdalin; bibliometric indices; cancer; human health; laetrile; vitamin B17.

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