INTRODUCTION

Characteristics of cyanogenic glycosides – amygdalin

Amygdalin is a cyanogenic glycoside produced by plants belonging to the Rosaceae family. It is also known as prunasin, laetrile, and bitter almond. Amygdalin is found in various plant species, including apricot kernels, bitter almonds, peach, plum, pear, apple, and almond seeds. It is a natural toxicant and is also used in traditional medicine for its supposed therapeutic properties.

Metabolism of cyanogenic glycosides – amygdalin

Amygdalin is metabolized in the body through the action of cyanogenic glycosidase enzymes, which hydrolyze amygdalin into the toxic form of cyanide (HCN) and a sugar (glucose). This process occurs in the small intestine and can lead to toxic effects if not properly managed.

The effects of cyanogenic glycosides – amygdalin on reproduction

The ingestion of amygdalin can have significant effects on reproduction. It has been shown to affect sperm motility and morphology, as well as the release of steroid hormones from granulosa cells in vitro. These effects can lead to abnormalities in the male and female reproductive systems.

Female system and amygdalin

Studies have shown that the addition of amygdalin to in vitro culture systems can affect the release of steroid hormones by granulosa cells. This can lead to alterations in the hormonal balance, which can have downstream effects on reproductive function.

Male system and amygdalin

The male reproductive system can also be affected by amygdalin. Studies have shown that the addition of amygdalin to in vitro test systems can alter sperm motility and morphology, as well as the release of steroid hormones from the testis.

Keywords: Amygdalin, metabolism, reproduction.
group. After the incubation of amygdalin, the spermatozoa motility decreased very significantly (P<0.001) in a dose-dependent manner, and all spermatozoa were immobile at 10 min. In addition, the percentages of morphological abnormalities did not change in comparison with the control group. The control values were between 4.21% and 6.87% (Tanyildiz and Bokzurt, 2004). It is not known whether amygdalin cross the blood-testes barrier. It has been reported that hyaluronidase enzyme plays an important role in supporting spermatozoa penetration into the cumulus oophorua matrix (Meyers and Rosenberger, 1999). Hyaluronidase activities were inhibited significantly by amygdalin (P<0.01) (0.4 to 2 μM). The inhibition of spermatozoa hyaluronidase activity and spermatozoa motility showed that these compounds have deleterious effects on bull spermatozoa in vitro (Tanyildiz and Bokzurt, 2004).

On the other hand prostate cancer is one of the most common non-skin cancers in men and amygdalin have been used to treat cancers and relieve pain. In particular, D-amygdalin (D-mandelonitrile-beta-D-gentiobioside) is known to exhibit selective killing effect on cancer cells. Apoptosis, programmed cell death, is an important mechanism in cancer treatment. Human DU145 and LNCaP cells treated with amygdalin exhibited several morphological characteristics of apoptosis. Treatment with amygdalin increased expression of Bax, a pro-apoptotic protein, decreased expression of Bcl-2, an anti-apoptotic protein, and increased caspase-3 enzyme activity in DU145 and LNCaP prostate cancer cells. Amygdalin induces apoptotic cell death in human DU145 and LNCaP prostate cancer cells by caspase-3 activation through down-regulation of Bcl-2 and up-regulation of Bax (Chang et al., 2006).

CONCLUSION

This review describes the characteristic, metabolism, possible effects of amygdalin on reproductive processes. Amygdalin itself is non-toxic, but HCN production decomposed by some enzymes is toxic substance. The possible effects of natural compound amygdalin on reproduction were shown in previous studies. The mechanism of action of amygdalin is unknown. The toxic effect of amygdalin or its benefit is controversial and realization of in vivo and vitro experiments is necessary.

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REFERENCES


