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Anticholinesterase Activities: The Possible Mechanism Suggestive Of Therapeutic Effect of Allicin in Garlic on Intestinal Neuronal Dysplasia Type B

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Abstract

Allicin components of garlic have been helpful medicinally because of its action as an indirect acting cholinergic agonist through its inhibitory effects on both acetylcholinesterase and butrylcholinesterase. This could also suggest therapeutic effects in the management of intestinal neuronal dysplasia type B, a disease which one of its pathophysiology has linked with increase acetylcholinesterase activities in the gut.

Keywords: Intestinal neuronal dysplasia; Allicin; Anticholinesterase; Chronic constipation; Garlic

Introduction

One of the indicated pathophysiological mechanisms of intestinal neuronal dysplasia type B is increase acetylcholinesterase activities in the lamina propria and submucosa [1] of the intestinal lumen. This increase acetylcholinesterase activities leads to excessive and rapid break down of acetylcholine a potent substrate for the cholinergic receptors there obliviating the effects of the parasympathetic nervous stimulation on the gastrointestinal tract resulting in decrease contractility and motility of the affected segment of the tract producing constipation one of the major presentation of intestinal neuronal dysplasia.

Intestinal neuronal dysplasia (IND) is a condition which present in infant and older children as chronic constipation either in isolation or in combination with Hirschsprung disease [2]. IND-type B is the commonest accounting for 95% of all cases [3] and it's characterized by hyperplasia of the parasympathetic submucosal plexus, increase acetylcholinesterase activity, hyperganglionosis and giant ganglia in the lamina propria [1,3]

Allicin is the organosulfur component found in garlic which has been indicated to be of therapeutic importance the n the management of some disease conditions [4]. Some of these effects as recorded by Alare et al 2020 [4] were as a result of the interaction of allicin in garlic with parasympathetic nervous system.

Anticholinesterase Activities of Allicin

Allicin the organosulfur compound gotten as a result of metabolism of alliin [5] in garlic has been reported to act as an indirect acting muscarinic agonist by it inhibitory effects onacetylcholinesterase and butrylcholinesterase [4]. Inhibiting the cholinesterase thereby reduce the rate at which acetylcholine is being broken down to choline and ultimately produce increase in parasympathetic nervous stimulation (Figure 1).

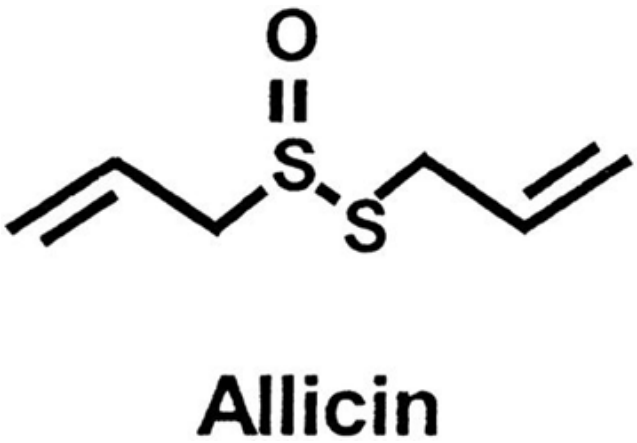

Figure 1: Allicin the organosulfur compound

Suggestive Therapeutic Effects on IND Type B

Though, the basic histopathology of intestinal neuronal dysplasia type B is not fully clear [2] but increase acetylcholinesterase activities has been implicated as one of the mechanism behind IND type B; this should suggest a Therapeutic effect of allicin which is an inhibitor of acetylcholinesterase on the management of IND type B. Allicin reducing the activities acetylcholinesterase by inhibiting should improve the parasympathetic nervous stimulation in the affected gut and hopefully leads to reversal of the dysplasia of the nervous plexus. The effects of allicin resolving chronic constipation has been recorded in a studies done [4], this was due to the anticholinesterase activities and this also could be helpful in the resolution of chronic constipation the major presentation of intestinal neuronal dysplasia type B.

We can't lay our hands on any study done to show the efficacy of allicin or other anticholinesterase on the management of IND Type B probably this is novel but we believe that if the pathophysiology of increase acetylcholinesterase activities is true then certainly there should be some therapeutic effects offered by allicin in garlic on IND

Type B. We thereby suggest that a study should be done to check for the therapeutic effects of allicin on the management of intestinal neuronal dysplasia type B; this may provide another breakthrough in the field of gastroenterology and also reduce the need for surgery in patients with intestinal neuronal dysplasia type B [6-8].

Conclusion

Researches on the therapeutic effects of allicin in garlic has been increasing lately because of the increase usage of it in herbal concoction and this is also suggesting another disease condition in which allicin may be useful if use appropriately because adverse effects of usage of allicin in garlic as also been reviewed. This review is inconclusive has evidence based research to support its hypothesis has not been recorded but also implore intended researchers who may be looking into this research to make urgent work so has to achieve a medical treatment for intestinal neuronal dysplasia type B as soon as possible.

Conflict of Interests

Authors declared no conflict of interest.

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