



Effect of Intraperitoneal versus Oral Drench of Beta-Amino Butyric Acid on Platelets in Sprague Dawley Rats

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Abstract

To study the effect of oral and injected BABA on platelet production this study was done, The first group (intra peritoneal injection group): This group consisted of 20 animals given (BABA) after dilution with 2 ml distilled water by intra peritoneal injection for four weeks, this group was divided according to BABA concentration into three secondary groups (5 animals per group): first concentration (1g/ kg), second concentration (0.5 g / kg), third concentration (0.25 g / kg) and control group was injected with distilled water 2 ml once a week for four weeks, The second group (orally drenching group): This group included 20 animals also given the substance (BABA) at the same concentrations and doses of the first group at the same time using oral route.

Keywords: BABA, Rat, Platelets.

Introduction

Many amino acids are end products in the process of secondary metabolism and some occur as mediators or as a result of metabolism or detoxification of exotic compounds. These compounds considered as components of plants or as antibiotics [1], the main sources of known non-protein amino acids are animals and microorganisms that are responsible for the secretion of many compounds in the environment [2]. A large portion of non-protein amino acids have Aliphatic structures, with no more than (6) carbon atoms in the chain length [3].

This study was conducted on the effect of β -amino butyric acid (BABA) on rat cells due to the lack of recent studies of any information related to this acid on animal cells, its effect on plant cells will be mentioned, Beta amino acids (β) Nature is compared to the amino acids α (protein) [4], and the amino acid (BABA) is a non-protein amino acid that occurs rarely in nature [5]. In the past years, BABA has used to activate the acquired systemic immunity in plants against many

plant pathogens including fungi, viruses, bacteria and nematodes [6, 7]. In the last two decades of the 20th century, some compounds shown to have the potential to induce resistance in plants against certain pathogens. BABA has shown to be the most effective compound in disease control at the experimental and production levels [8, 9]. The aim of this study to investigate the role of BABA in thrombopoiesis in rats.

Materials and Methods

Animal Groups

The first group (intra peritoneal injection group): This group consisted of 20 animals given (BABA) after dilution with 2 ml distilled water by intra peritoneal injection for four weeks, this group was divided according to BABA concentration into three secondary groups (5 animals per group): first concentration (1g/ kg), second concentration (0.5 g / kg), third concentration (0.25 g / kg) and control group was injected with distilled water 2 ml once a week for four weeks.

The second group (orally drenching group): This group included 20 animals also given the substance (BABA) at the same concentrations and doses of the first group at the same time using oral route [10].

Blood Test

The study included the measurement of the total (Platelets) counting [11].

Statistical Analysis

The Statistical Analysis System-SAS (2012) was used for the analysis of data, and to determine the significance differences

between treatments according to the Completely Randomized Design-CRD, and compared the significant differences between the mean by Least Significant Differences (LSD).

Results

Effect of (BABA) in Platelets

Results of statistical analysis were shown in Table. 1 There was a significant increase ($P < 0.01$) in the Platelets in both groups and in all concentrations compared to the control group, and the increase elevated with high concentration.

Table1: The effect of (BABA) in Platelets

BABA (g)	Mean ± Standard error		Value LSD
	IP injection	Drench	
C1 (1g)	a1161.9± 45.3	26.95 b828.80±	** 111.63
C2 (0.5g)	11.22 c972.0±	17.2a907.40±	** 47.71
C3 (0.25g)	26.44ac894.60±	16.86 c666.40±	87.89**
Control	b654.2± 21.3	d611.80±3.65	** 28.02
value LSD	** 82.89	** 54.33	—

**($P < 0.01$) The means that have different letters within the same column vary significantly between them

Discussion

Beta-β-amino acids form peptide chains which enhance bioavailability of pharmaceuticals [12]. The thrombocytosis may occur due to activation the secretion of pro-inflammatory cytokines that increase demand of thrombopoiesis. From previous study, we found an increasing in immunoglobulin (IgG) of rats drenched or injected BABA [12] which indicates that BABA may activate the immune system and platelet production.

Other researcher showed that platelets contribute in interference against the microbial threats, recruitment and elevation of innate effector cell functions; modulating antigen presentation; and enhancement of adaptive immune responses [13]. It has been documented that BABA have the same role of GABA, So that, the researcher found that

GABA causing increase in the platelet production [14]. Proinflammatory cytokines have a dual role to induce expression of a variety of genes and the synthesis of proteins that, in turn, induce acute and chronic inflammation; whereas on the other hand, they serve as "alarm systems" which lead to increases in a variety of defense mechanisms, particularly immunologic and hematologic responses [15].

Conclusion

BABA can be used in case of thrombocytopenia to increase the thrombopoiesis, the results showed that there was a significant increase ($P < 0.01$) in the Platelets in both groups and in all concentrations compared to the control group, and the increase elevated with high concentration.

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