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γ -氨基丁酸对断喙雏鸡血清细胞因子含量及脾脏中 *Bcl-2*和*Fas*基因mRNA表达量的影响

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γ -Aminobutyric Acid Affects Serum Cytokine Contents and mRNA Expression Levels of *Bcl-2* and *Fas* genes in Spleen of Chicks under Beak Trimming Stress

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摘要 本试验旨在研究 γ -氨基丁酸(GABA)对断喙应激条件下雏鸡生长性能、血清细胞因子含量及脾脏中细胞凋亡相关基因B细胞淋巴瘤/白血病2(B-cell lymphoma/leukemia-2, *Bcl-2*)和*Fas*基因mRNA表达量的影响。选取1日龄体重相近的健康固始鸡公雏360只,随机分为5个组,每组6个重复,每个重复12只鸡。其中A、B、C组均为断喙组,饮水中分别添加40、60和80 mg/kg的GABA;D组不断喙,不添加GABA;E组断喙,不添加GABA。结果表明:1)断喙应激导致雏鸡采食量减少、体重下降,添加GABA可以提高采食量和体重;2)断喙应激引起了血清白细胞介素1 β (IL-1 β)、白细胞介素6(IL-6)和肿瘤坏死因子 α (TNF- α)含量的升高,第1、5天E组血清IL-1 β 含量显著高于D组($P<0.05$),添加80 mg/kg GABA显著降低了血清IL-1 β 含量($P<0.05$);与D组相比,断喙后第1、7天E组血清TNF- α 和IL-6含量均显著升高($P<0.05$),添加80 mg/kg GABA后显著降低($P<0.05$);3)E组第1、3、7天脾脏中促凋亡基因*Fas* mRNA表达量显著高于D组,添加GABA后下降,且随着GABA剂量加大而进一步降低($P<0.05$),添加80 mg/kg GABA可轻度上调抗凋亡基因*Bcl-2* mRNA表达量($P>0.05$)。由此可知,GABA在改善断喙应激雏鸡生长性能方面具有良好效果,同时添加GABA抑制了断喙应激后雏鸡血清细胞因子含量以及脾脏中促凋亡基因*Fas*的mRNA表达量的升高,且添加80 mg/kg效果较好。

关键词: γ -氨基丁酸 断喙应激 细胞因子 细胞凋亡 雏鸡

Abstract: This experiment was conducted to investigate the effects of γ -aminobutyric acid (GABA) on growth performance, serum cytokine contents and mRNA expression levels of apoptosis-related gene B-cell lymphoma/leukemia-2 (*Bcl-2*) and *Fas* gene in spleen of chicks under beak trimming stress. A total of 360 one-day-old healthy *Gu-shi* male chicks were randomly divided into 5 groups (A, B, C, D and E) with 6 replicates per group and 12 chicks per replicate. Groups A, B and C were supplemented with 40, 60 and 80 mg/kg GABA in drinking water, group D was not supplemented with GABA, and group E was supplemented with GABA. The results showed as follows: 1) beak trimming induced FI and BW to decrease, whereas supplemented with GABA could increase FI and BW of chicks under beak trimming stress ($P<0.05$). 2) The contents of interleukin-1 β (IL-1 β), interleukin-6 (IL-6) and tumor necrosis factor- α (TNF- α) in serum were increased by beak trimming stress, the serum IL-1 β content in group E was significantly higher than that in group D on the first and fifth days ($P<0.05$), and the supplementation of 80 mg/kg GABA significantly decreased the serum IL-1 β content. Compared with group D, the contents of TNF- α and IL-6 in serum in group E were significantly increased on the first and seventh days ($P<0.05$), and supplementation of 80 mg/kg GABA significantly decreased the contents of TNF- α and IL-6 in serum ($P<0.05$). 3) The splenic *Fas* gene mRNA expression level in group E was significantly higher than that in group D on the first, third and seventh days ($P<0.05$), and the splenic *Fas* gene mRNA expression level was decreased with GABA supplementation ($P<0.05$), the supplementation of 80 mg/kg GABA could increase the splenic *Bcl-2* gene mRNA expression level ($P>0.05$). In conclusion, GABA can improve the growth performance of chick under beak trimming stress, and it also inhibit serum cytokines contents and splenic *Fas* gene mRNA expression under beak trimming stress, and the optimum supplementation level of GABA is 80 mg/kg.

Keywords: γ -aminobutyric acid, beak trimming stress, cytokine, apoptosis, chicks

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