



Effects of Aqueous Ginger Extract on Some Hematology Parameters, Serum Iron, Ferritin, and Total Iron Binding Capacity in Male Mice (*Mus musculus* L.)

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Abstract

BACKGROUND: Ginger is a common spice with wide range of medicinal properties for benefit in treatment of anemia and also for enhancement the level of iron and other function of blood. Ginger is considering an active compound that stimulated remedy state of anemia and help in differentiation of red blood cells. Furthermore, the extract has more than wide chemical substances which play important role for many effects in human and animal.

AIM: The present study aimed to evaluate the effects of ginger on some hematological parameters as well as on serum iron, ferritin, and total iron binding capacity.

SUBJECTS AND METHODS: Thirty adult male mice were randomly divided into three groups, two treated (T1 and T2) and one negative control (NC) groups. The experimental groups were injected intraperitoneally 2 and 4 mg aqueous ginger extract, respectively, every day for 30 days, while the NC group only received the distilled water with the same dose. The estimation of total iron binding capacity and serum iron was measured by an automated analyzer from Roach, While serum ferritin measurement by the direct immunoenzymatic method.

RESULTS: PCV significantly rise in both dose (32.87 ± 5.61) (30.12 ± 6.82), also Hb (11.31 ± 1.43), RBC (5.99 ± 3.52), MCV (70.99 ± 2.41), and MCHC (34.82 ± 4.32) appeared significant increase only in high dose, while MCH clarified not significant effect in two doses. TIBC not reach to significant differences in groups treated with two portion, whereas, rises serum iron (23.72 ± 6.28) and ferritin (58.34 ± 7.41) significantly appeared in high dose only compared with group in control at $p < 0.01$.

CONCLUSIONS: The ginger safe, benefit for blood component, and help in remedy of anemia and development iron absorption, also it is consider a beneficial as a promising therapy to prevent and treat iron deficiency anemia by rises a percent of hemoglobin and enhancement the iron status parameters.

Introduction

Ginger (*Zingiber officinale*) is a flowering plant, common spice that belongs to the Zingiberaceae family and its rich in different chemical constituents including vitamins, nutrients, minerals, and antioxidants which consider and have many effects related to health [1]. Therefore, it has a very long history of use in various forms of traditional and alternative medicine [2]. The high content of iron and vitamin C is found in spice ginger which is beneficial for erythropoiesis, more studies have focused that extract of ginger and the supplementation of iron was important to be effect in iron deficiency anemia correcting and consume ginger will be safe in animals and humans with no mortality and side effects [3], [4]. Some of constitute are uses in the inhibition or treatment of different conditions and diseases, such as anemia, vomiting, platelet aggregation, inflammation, hypertension pain, asthma, colds, nausea, and some types of cancers with beneficial effects of an aqueous ginger extract on the immune system cells and antibodies, hematology, and thyroid

hormones in male smokers and non-smokers [5], [6]. Iron is a mineral that our bodies need for several functions, it has an essential role in erythropoiesis (production of RBC₁), a major part of hemoglobin and is also a part of many other proteins and enzymes [7]. Hence, a lack of iron can lead to iron deficiency anemia, that is, the condition, where the blood lacks enough red blood cells containing hemoglobin to carry oxygen [8]. The body needs iron but cannot synthesis this mineral independently; therefore, a constant supply of iron from food is essential [9]. Recently study belay that ginger is a substance which can helps for improve anemia, production of hemoglobin, and stimulate erythropoiesis [10]. In the present study, we attempt to clarify the ginger role by estimating the effects of different ginger extract doses on the hematological parameters in male mice including: The hemoglobin (Hb), red blood cells count (RBC₁), packed cell volumes (PCV), mean corpuscular volume (PCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC). As well, in the same experiment we trail the effects of aqueous ginger extract in different doses on the total iron binding capacity, ferritin and