Comparison of the Therapeutic Effects and Side Effects of Oral Iron Supplements in Iron Deficiency Anemia

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Key words
- ferric
- ferrous
- malnutrition

Abstract

Objective: Iron deficiency anemia is an important public health issue, especially for infants, children, and women with menorrhagia. Oral iron supplements are the cheapest, safest, and most effective treatment. This study compared the therapeutic and side effects of ferrous and ferric in iron deficiency anemia.

Methods: This was a retrospective study on data collected between April 2012 and October 2013 for patients with iron deficiency anemia who continuously took oral ferric for over one month and then switched to oral ferrous due to poor therapeutic effects. The exclusion criteria were the use of other oral or injected iron preparations, erythropoietin, or vitamin B12.

Results: A total of 41 participants were recruited. The average participant age was 44.76±16.89 years; most participants were females (95.1%; 39/41); the average daily dose of oral ferric (139.02±49.39 mg) was higher than that of ferrous (96.34±23.43 mg). Repeated measures: mixed model analyses were conducted to examine patients' clinical blood test values. The results showed that the mean blood test values for all patients significantly increased after switching to ferrous ($p < 0.01$, with the exception of mean corpuscular hemoglobin). One patient experienced gastrointestinal discomfort and diarrhea after switching to ferrous.

Conclusion: This study found that blood test values improved after iron deficiency anemia female patients who displayed poor therapeutic effects with oral ferric switched to ferrous. Literature review showed that the risk for gastrointestinal problems with ferrous is higher than that with ferric. However, no significant difference was found in this study.

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Bibliography
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Introduction

Common causes of iron deficiency anemia include insufficient iron, inadequate iron utilization due to chronic diseases or inflammation, decreased iron absorption, and excessive loss of iron. Iron deficiency anemia is the most common form of anemia and occurs when iron is unable to support the production of hemes [1].

According to the World Health Organization (WHO) [2], a lack of iron is the most common manifestation of malnutrition, affecting 2 billion (25%) of the world's population. Iron deficiency is common and an important public health issue in developed countries. It is also commonly found in Western countries especially in infants, children, women with menorrhagia, pregnant women, and women after childbirth [3]. Iron deficiency anemia increases pathological changes and the mortality rate [4]. A large epidemiological study from France [5] showed that approximately 93% of women have insufficient dietary iron intake and 23% of women of childbearing age lack iron, among which 4% are anemic. A 2008 Nutrition and Health Survey in Taiwan [6] showed that the risk of iron deficiency in adult women was 7.7 times greater than in men. A survey of data from 1993 to 2010 showed that one out of 6 adult women who is iron deficient and unaware of that deficiency.

Iron deficiency is most often due to an insufficient intake of dietary iron, insufficient iron use due to chronic or inflammatory diseases, poor iron absorption, and iron loss. The majority of anemia cases due to iron deficiency can be prevented through iron supplements and reduction of iron loss. Iron is a basic element used to carry oxygen and aid in cell growth and survival. The average adult body contains 3.5 g of iron (approximately 4 g for males and 3 g for females), most of