■ **Editorial**

Association between Coffee and Green Tea Consumption and Iron Deficiency Anemia in Korea

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The coffee intake in Korea is 2.7 times higher than that worldwide. In 2018, the average coffee consumption per person in Korea was 353 cups per year, and the world average was 132 cups. In Korea, coffee intake has increased annually, with a reported increase of 1.5 times in 2018 compared with that in 2013.[1]

However, habitual tea consumption, including green tea consumption, is less popular in Korea than in Western countries and China. In 2018, the annual consumption of green tea was only 100 g per person in Korea, compared with 3,000 g in the United Kingdom, 800 g in China, and 350 g in France.[2]

Coffee and tea contain antioxidants, such as polyphenols, which reduce the risk of cardiovascular disease. Studies have shown that habitual coffee consumption is associated with a lower prevalence of diabetes[3] or pre-diabetes, insulin resistance,[4] stroke,[5] Parkinson's disease,[6] and cardiovascular diseases.[7] The anti-inflammatory effects of coffee also reduce the risk of cancer and mortality.[8] In contrast, caffeine and tannin combine with minerals to prevent the absorption of nutrients such as calcium, magnesium, zinc, phosphorus, and iron.[9]

Lee et al.[10] examined the association between factors indicating iron metabolism, such as ferritin and hemoglobin levels, and the consumption of coffee or green tea in Korean women before menopause, using data from the Korea National Health and National Examination Survey (KNHANES) 2010–2012. Ferritin levels decreased by 2.09 ng/mL with a single cup increase in daily coffee intake (β=-2.09, P<0.001). However, no significant correlation was observed between green tea consumption and the overall biochemical markers of iron deficiency.

Previous studies have shown that coffee and tea intake affect the biological availability of iron.[11] However, no research has been conducted on this association in premenopausal women. Menstruating and pregnant women are at a high risk of developing iron deficiency anemia, which is influenced by various dietary factors. Hence, a larger sample size is needed to reveal the associations in premenopausal women.

Non-heme, which accounts for 90% of total iron intake, has a low absorption rate and is affected by other components. Absorption-enhancing factors include ascorbic acid, meat, fish, and poultry, and inhibiting factors include plant components in vegetables and calcium.[9] In particular, coffee and green tea intake reduce iron absorption in the non-heme form.

In contrast, green tea consumption was not associated with IDA. The low tea consumption compared to that in Western countries and China can be explained. In this study, >90% of the participants consumed less than a cup of green tea per day, which was much lower than that consumed by the others. As the total intake of coffee and green tea increased, ferritin levels significantly decreased after adjustment for potential confounders (P=0.023), which may be attributed to coffee consumption. In this study, coffee and green tea were not associated with hemoglobin levels but with ferritin levels. Therefore, further studies using updated factors that indicate iron metabolism, such as total iron-binding capacity, are needed.

Iron absorption is influenced by several dietary factors (enhancing and inhibitory factors), and brewing methods and

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additives, such as sugar, milk, or cream, can affect hemoglobin levels. To reveal this causal relationship, well-designed large-scale observational studies are required to adjust for these confounding factors.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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