

## Serum vitamin B12, folate, ferritin and iron levels in Turkish patients with vitiligo

Sir,

Vitiligo is a multifactorial polygenic disorder with a complex pathogenesis. The most probable pathological mechanisms are immune-mediated and damage of melanocytes due to free radicals.<sup>[1]</sup>

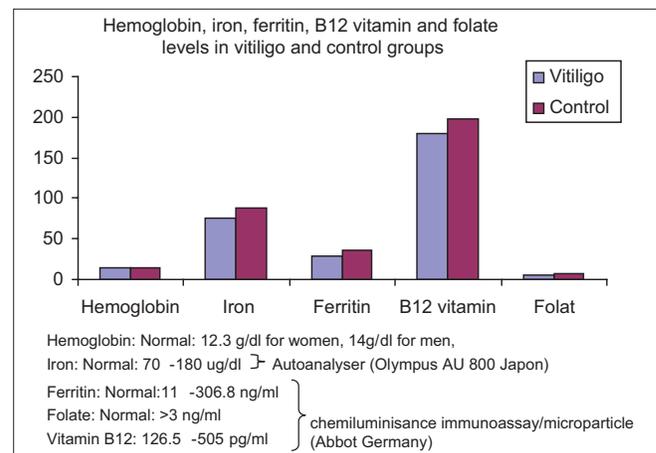
Oxidative stress, characterized by an increase in free-radical production exceeding the intracellular antioxidant defence, has been proposed as a possible pathogenetic mechanism for vitiligo.<sup>[1]</sup> Iron is involved in antioxidative system and large amounts of iron is sequestered by ferritin. Ferritin is an important acute phase reactant and its serum level is increased in some autoimmune disorders.<sup>[2]</sup> There is only one report investigating serum ferritin levels in vitiligo.<sup>[3]</sup> We retrospectively investigated the levels of serum vitamin B12, folate, ferritin and iron levels in vitiligo patients.

Forty-two vitiligo patients and 36 sex and age matched healthy controls were included in this study within eight months period retrospectively. Age, sex, duration, activity and family history of vitiligo were recorded. Exclusion criteria were disorders and drug use that could alter levels of vitamin B12, ferritin, iron and folate and other autoimmune disorders. Vitiligo patients were divided into two groups as active and stable according to the progression of the disease in the last two months. Vitamin B12, folate, ferritin and iron levels in vitiligo patients were compared with the control group and also the parameters in vitiligo were statistically compared with age and sex of the patients, duration, activity and family history of vitiligo by Mann-Whitney U test, and Spearman correlation analysis.

Twenty-four (57%) of vitiligo patients were males and 18 (42.9%) were females. The mean age was  $36.3 \pm 16.9$  (ranged from 8 to 72 years). The median time of vitiligo was 36 months (ranged from 1 to 360 months). Twenty-three (56%) of the patients had active vitiligo and 18 (44%) had stable disease. Low levels of hemoglobin, vitamin B12, ferritin, folate

and iron were detected in 4, 3, 9, 2 and 12 vitiligo patients, respectively. When the number of low levels of hemoglobin, vitamin B12, ferritin, folate and iron were compared between the patient and the control group, no statistically significant difference was found ( $P > 0.05$ ). Also, no significant difference was found between the patient and the control groups in levels of these hematinic parameters ( $P > 0.05$ ) [Figure 1]. Folate and vitamin B12 levels did not show significant difference according to sex, age, family history, duration and activity of disorder ( $P > 0.05$ ). Iron, ferritin, hemoglobin levels were significantly lower in females than males in the patient group ( $P = 0.035$ ,  $P = 0.006$ ,  $P = 0.001$  respectively).

Immune-mediated and free radical damage to melanocytes is the most probable pathological mechanism for vitiligo.<sup>[1]</sup> Although the exact immunopathogenic mechanisms are still unknown, the autoimmune pathogenesis of vitiligo has been supported by some data from the literature: detection of circulating antibodies to melanocytes and circulating melanocyte specific cytotoxic T cells in vitiligo patients, the association with other autoimmune disorders and vitiligo.<sup>[4]</sup>



**Figure 1: Median levels of hemoglobin, iron, ferritin, vitamin B12 and folate in vitiligo and control groups**

**How to cite this article:** Gönül M, Çakmak SK, Soylu S, Kılıç A, Gül Ü. Serum vitamin B12, folate, ferritin and iron levels in Turkish patients with vitiligo. Indian J Dermatol Venereol Leprol 2010;76:448.

**Received:** September, 2009. **Accepted:** May, 2010. **Source of Support:** Nil. **Conflict of Interest:** None declared.

The second most probable mechanism is oxidative stress characterized by an increase in free radical production. Various antioxidants, alone or in combination with phototherapy, have been used for the treatment of vitiligo.<sup>[1]</sup> Although several reports suggested that vitamin B12 and folate levels are decreased in vitiligo patients, the study of Kim *et al*, did not show any difference in vitamin B12 and folate levels between vitiligo and control groups.<sup>[5]</sup> Our study showed that vitamin B12 and folate levels in vitiligo patients were not different than those of control similar to outcomes of Kim *et al*. Also, we did not detect pernicious anemia in vitiligo patients.

Iron is an essential element which can catalyze the formation of potentially toxic free radicals. The expression of ferritin is regulated by levels of iron, cytokines, hormones, and oxidative stress. Ferritin has been reported to exhibit different immunological activities including suppression of antibody production by lymphocytes, decreasing the phagocytosis of granulocytes and suppression of delayed type of hypersensitivity. Ferritin levels are increased in inflammation, infections and malignancies.<sup>[2]</sup> Recently, ferritin has been accepted as a novel marker for autoimmunity and its level may increase in autoimmune disorders. Ferritin has been evaluated only once previously in vitiligo patients. In this study, Boisseau-Garsaud *et al*, reported that ferritin levels were not significant from the control group.<sup>[3]</sup> Our study supports these results.

According to the results of our study, we assume that iron, ferritin, vitamin B12, folate do not play a role in the etiopathogenesis of vitiligo and did not vary according to the duration of the disorder and activity of vitiligo. The lower levels of ferritin, iron and hemoglobin in females in the patient group may be related to the loss of iron via menstrual cycle, abortion or delivery or nutritional habitus in females.

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**DOI:** 10.4103/0378-6323.66611 -

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