

Effect of Vitamin B12 and Folic Acid in Vitiligo Patients

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ABSTRACT

Objective: To determine the effect of vitamin B12 and folic acid levels in vitiligo patients.

Study Design: Cross-Sectional Study.

Setting: This study was carried out in the Dermatology department at Liaquat University of medical and health sciences (LUMHS), Jamshoro

Duration: Six months starting 6th August 2019 till 5th January 2020

Material and Methods: A total of 155 patients of either gender with age 18 to 50 years and who had Vitiligo for more than one year were included in the study. Fasting (5ml) blood sample was drawn using. After clotting, the sample was centrifuged for 10 minutes at 5000 rpm, and serum was separated and stored immediately at -200C. To check the levels of vitamin B12 and folic acid, we used enzyme immunoassay. Using SPSS version 20, the data was recorded and analyzed. We calculated the mean, standard deviation, frequency, and percentages for qualitative analysis, and data stratification was done, and a t-test was applied to compare the mean difference of both dietary nutrients (vitamin b12 and folic acid) among stratified groups. $P \leq 0.05$ was taken as significant.

Results: Out of 155 patients, 42% were male, and 58% were female with a mean (SD) age of 28.68 ± 10.07 years. The age range showed 41.9% patients falling above 25 years of age and 58% falling in < 25 years of age bracket. The stages of Vitiligo showed that stage-0 was found in 14 patients, stage-1 was found in 28 patients, stage-2 was found in 27 patients, and stage-3 was found in 86 patients. The mean level of serum vitamin B12 and folic acid was 375.56 ± 210.65 pg/dl, with a control range of 1320(110–1435) pg/dl, i.e., it was lower. 375. The mean difference in duration of Vitiligo was statistically significant, i.e. ($p=0.000$). A significant difference was found in age groups.

Conclusion: Our results showed decreased levels of serum vitamin B12 and folate; however, more in-depth studies should be done for conclusive statements.

Keywords: Serum Vitamin B12, Folic Acid Level, Vitiligo

INTRODUCTION

Vitiligo dates back to 1500 years BC, meaning the minor blemish derived from the word "Vitulium" and has been mentioned in different religious texts from Vedic to Egyptian.¹

Vitiligo is an intricate type of disorder that causes the skin to change its color due to the autoimmune destruction of melanocytes.² The initial signs of the disease start showing up in few areas of the body and sometimes many parts. In patients with Vitiligo condition, patches can appear on some aspect or various parts of the body. Commonly Vitiligo affected areas are the facial site, feet, forearm, scalp, fingers, dorsal hand, and neck region; however, they may appear on the genital area, areola, and nipples.^{2,3} Koebner defined in his study that traumatic sites can also cause vitiligo growth on cuts and burns in or about 20 to 60% of patients. In some cases, hairs on the body may also depigment.⁴

The Clinical signs include discoloration of the skin, greying of hairs at an early age, discoloration in the mucous membranes, discoloration of the retina or discolored patches around armpits, rectum, genitals, etc. Sometimes it may appear due to hereditary reasons and other polygenic pigmentary disorders.⁵ To assess the patient, a physician

may carry out a detailed history; however, no laboratory test is needed for investigations such as skin biopsy, etc.⁶

About 0.5 to 2% of the world population, including children and adults, get affected by the skin's pigmentary disorder.^{6,7} In India, the estimated prevalence recorded is 0.5 to 2.5%, with an excess of stats coming from Rajasthan and Gujrat.^{8,9,10}

Irrespective of race, caste, and creed, Vitiligo happens in all ages, primarily prevalent before the age of 20 years. The typical forms found commonly are generalized Vitiligo, focal Vitiligo, orofacial, segmental, and acral vitiligo.

Generally, Vitiligo patients are known to have decreased hemoglobin levels (folate) and vitamin B-12, and either of the nutrients is the prime elements that constitute the amino acid homocysteine, and their deficiency can cause high **homocysteine levels**.¹¹ The component of Homocysteine primarily hinders the enzyme tyrosine by combining with copper at its state of activity, causing a reverse hypopigmentation process.¹²

Researches show that Vitiligo is directly proportional to homocysteine levels, which can help reduce melanocytes in Vitiligo by varying the amounts of folate and vitamin B12.¹³ Further to its treatment, better recovery

rates have been reported the vitiligo disease after intake of vitamin B12 and folate supplements.¹⁴

A study carried out by Sir Sunderlalon 200 patients of Vitiligo in India showed “the mean value of serum folic acid (4.88 ±1.52 vs. 6.25 ±0.69) and vitamin B12 (428.46 ±133.52 vs. 536.63 ±111.43) “which got lessened in the patients comparatively than the mean values of a control group who showed normal levels.¹⁵

Our study's rationale is to determine the effect of vitamin B12 and folate as contributing reasons for Vitiligo and provide knowledge on therapeutic interventions to aid the health care workers.

MATERIALS AND METHODS

This study was carried out in the Out-patients department of dermatology, Liaquat University of medical and health sciences (LUMHS), Civil hospital, Jamshoro, for six months from 6th August 2019 to 5th January 2020. A total of 155 patients with Vitiligo with 65 males and 90 females.

Fasting (5ml) blood sample was drawn using. After clotting, the sample was centrifuged for 10 minutes at 5000 rpm, and serum was separated and stored immediately at -200C. Vitamin B12 and folate levels were determined using an enzyme immunoassay. We recorded the Mean Age, age group, patient's frequency & Standard Deviation. We conducted our analysis using SPSS version 20 and used a two-sample t-test to compare the means of folate and vitamin B-12 levels taking P≤0.05 as significant. For our study, we included patients with duration of Vitiligo > 1 year and excluded;

- Patients with age < 18 and > 50 years
- Patients taking supplements of folic acid and B12
- Patients who are anemic (suggested when hemoglobin level in a male are less than 13.5 g/dl and less than 12.5 g/dl in females)
- Patients have pre-existing chronic conditions, i.e., high blood pressure, Sugar, thyroid issues, heart problems, kidney failure, deep venous thrombosis, Bechet's syndrome, and skin disorders psoriasis.
- Pregnant women

RESULTS

Out of the total population of 155 patients, 42% were male, 58% were females with a mean (SD) age of 28.6(10.075) and maximum age of 50 years and minimum age of 18 years observed in patients. The age distribution is presented in (Figure-1) showing 41.9% of patients above 25 years of age and 58% < 25 years of age.

Table-1 Demographics of Vitiligo Patients

Demographics	
Mean (SD)	28.6(10.075)
Male %: Female%	42% : 58%
Max to Min	50 yrs. to 18 yrs.

The results about stages of Vitiligo showed that stage-0 was found in 14 patients, stage-1 was found in 28 patients, stage-2 was found in 27 patients, and stage-3 was found in 86 patients. (Figure-2)

The mean level of serum vitamin B12 was 375.56±210.65 pg/dl, with a control range of 1320(110–1435) pg/dl, i.e., lower. Comparison of means gender-wise

study shows that the level of vitamin B-12 was higher in women (385.21 pg/ml) compare to men (362.21 pg/ml).(Figure-3)

Figure-1 Age-Group & Percentage of Vitiligo Patients

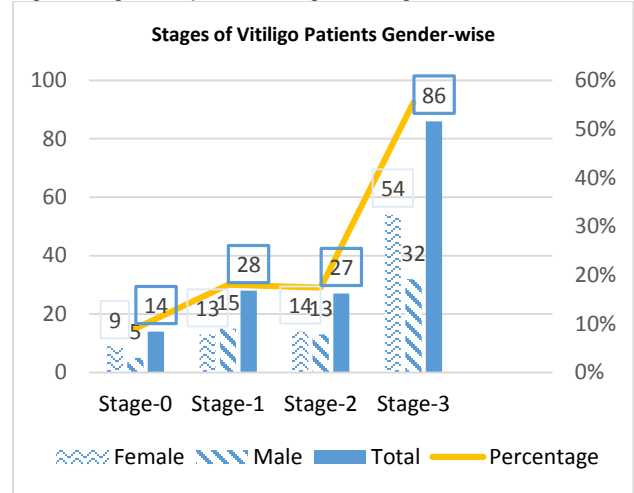


Figure-2 Stages of Vitiligo Patients Genderwise.

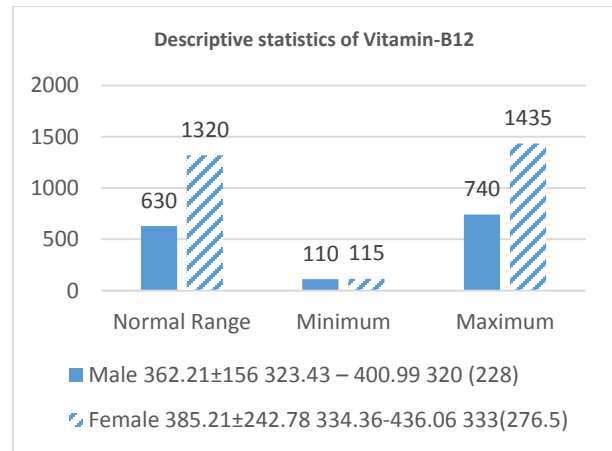


Figure-3 Descriptive Statistics of Gender-wise Vitamin B12 in vitiligo Patients

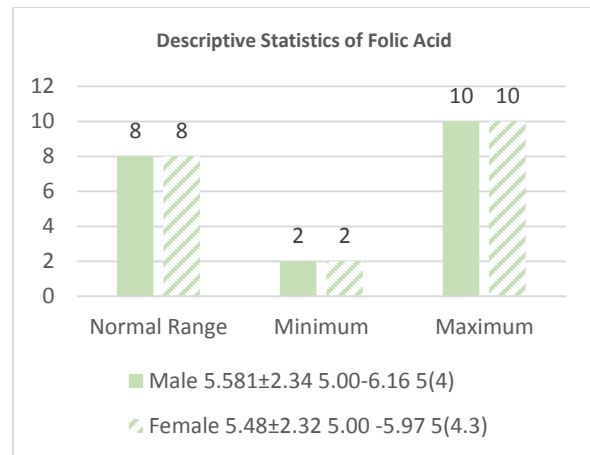


Figure-4 Descriptive Statistics of Gender-wise Folic Acid in Vitiligo Patients

The mean level of folic acid was 5.52 ± 2.32 pg/dl, with a range of 8(2–10) pg/dl also showing a lower mean comparatively, while the level of folate with male (5.58) and female (5.48) showed no significant difference.(Figure-4)

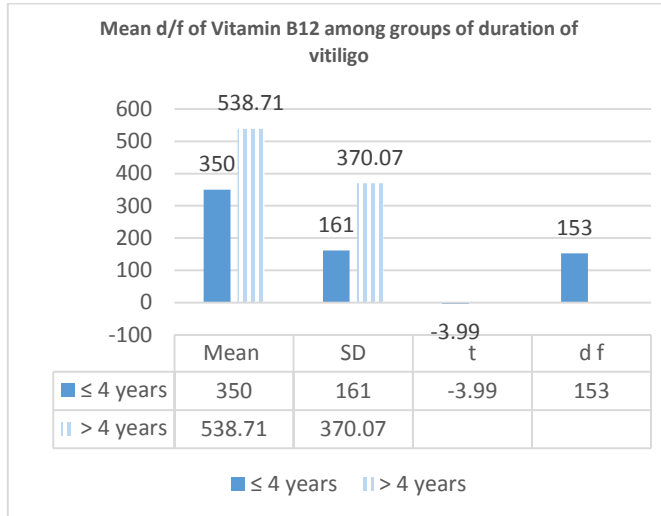


Figure-5 Mean Difference in Vitamin B-12 among groups of the duration of vitiligo

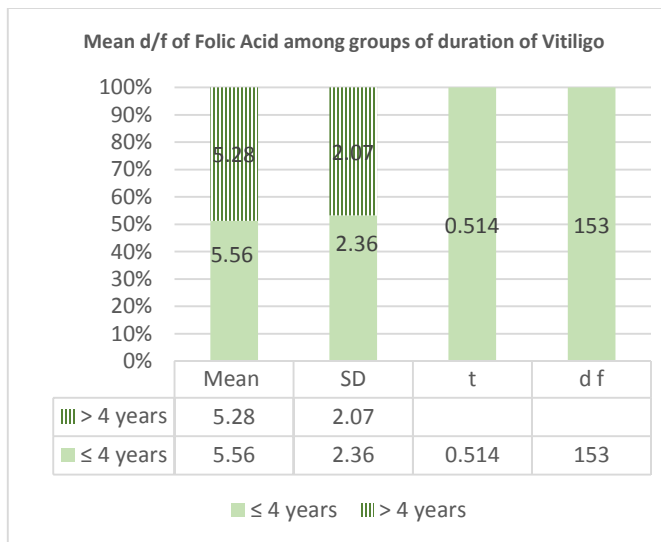


Figure-6: Mean Difference in Folic Acid among groups of the duration of Vitiligo

Our results present the mean difference in folate and vitamin B-12 in figure-5 and six as statistically significant in Vitiligo duration, i.e. (p=0.000).

DISCUSSION

Vitiligo has been clinically described as depigmenting of the skin developing into patches which could result due to oxidation from toxic parts of melanin.^{15, 11}the prevalence rate of anemia in patients with Vitiligo has been recorded to be 3.7% with Vitiligo has been reported to be found in 0.5 to 2% in the population.¹⁶

However, the development of Vitiligo has not found a definitive cause, yet the value of oxidative stress also other neurogenic complexesshoweda notable effect on it.¹⁷Thus many studies have reported vitamin B12 as a corrective therapy for vitiligo patients and the use of folates such that both stimulateeach other's biochemical process.¹⁸

Researches show that Vitiligo is more frequent in females than in males, which is well supported by our statistic too, with 58% of patients being females and 42% males with a mean age of 21.32 ± 2.18 years (18 to 50 years).One such local study conducted on 100 cases reported that 55% of females and 45% of males supported another study showing mean age of $27.02 + 18.34$ years (5.5 months to 82 years).¹⁹

In our study, vitamin B12 and folate deficits were reported with mean 375.56 ± 210.65 and 5.52 ± 2.32 , respectively. Incomparable to these results, another study reported that the mean vitamin B-12 and folate were recorded as 157.18 ± 68.95 pg/mL and 4.18 ± 3.55 ng/mL, significantly lower than the control group.^{11,22}, however, researchof Kim et al. and Gonul et al. showed no noteworthyvalues in vitamin B12 and folic acid in vitiligo and control groups.²³

A significant reduction in serum vitamin B12 and folate levels in vitiligo cases was witnessed by Singh et al.²¹

Our results show that the mean difference in vitamin B-12 and folate on the duration of Vitiligo isstatistically significant,i.e.(p=0.000).A recent study conducted by Nadia and colleague found serum vitamin B12 and folate to be lower in patients than control subjects, and it reported the difference to be statistically significant (P=.05, P=0.001).²³According to Tjioe et al. and Juhlin et al. works a clarity of vitiliginous skin and depigmentation was seen in vitiligo patients using folate and vitamin B12 supplements orally with exposure to sunlight.²⁴Many other studies have reported the topical application of vitamin D as an effective remedy for Vitiligo patients.²⁵

CONCLUSION

In our study,serum vitamin B12 and folic acid levels has significant effect on the duration of vitiligo patients .Thus showing managing their intake can give good recovery rates in vitiligo patients.However,more in-depth studies should be done for conclusive statements.

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