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STUDY OF SERUM LEVELS OF VITAMIN B12, FOLIC ACID IN PATIENTS WITH VITILIGO

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Abstract

Background: Vitiligo is a pigmentary disorder of the skin with complex etiopathogenes is that is associated with depression and an impaired quality of life. There has been conflicting reports on the relationship between the disease and the serum levels of vitamin B12 and folic acid**.**

Objectives: To assess the serum levels of vitamin B12 and folic acid in patients with vitiligo and control group.

Method: This study was conducted among thirty five patients with vitiligo and thirty five age and sex matched controls presented to Dermatology OPD in tertiary care hospital, Ballari. Duration of study was January to December 2021.

Results: Serum levels of vitamin B12 and folic acid are not related age and diet of the patients, duration and the activity of the disease.

Conclusion: Another area to be explored is the therapeutic effect of vitamin B12 and folic acid supplementation on progression of the disease.

Keywords: Vitamin B12, folic acid, vitiligo, control

INTRODUCTION

Vitiligo is an acquired idiopathic disorder of depigmentation that can be both disfiguring and distressing. Its incidence in India is higher and varies between 1.25 to 8.8%[1]. The etiopathogenesis and mechanisms of vitiligo are not fully understood yet and continue to be under debate. Death of the pigment cells may be caused by factors from inside and / or outside the cell and there are many potential systems that could be involved. However, the exact cause of destruction of epidermal melaonocyte is complex and not yet fully understood. An association between vitiligo and reduced serum levels of vitamin B12 and

folic acid has been suggested[2]. Folic acid and vitamin B12 serve as cofactors of homocysteine.

Methyl transferase for the conversion of homocysteine to methionine[3]. The levels of these three compounds appear to be interconnected, with deficiencies in folic acid and vitamin B12 level indicating an increase in the levels of homocysteine in serum[4]. Studies have shown that repigmentation of vitiligo lesions is possible with supplementation of vitamin B12 and folic acid[5,6]. However few studies showed no differences in vitamin B12 and folic acid levels between vitiligo patients and control groups[2,7].

Since the data on serum levels of vitamin B12, folic acid in patients with vitiligo are mostly conflicting and there have been controversies over role of these factors in the pathogenesis of vitiligo, we conducted this study to further investigate the likely relationship between the disease and vitamin B12 and folic acid levels.

MATERIALS AND METHODS

This hospital-based case control study was conducted among thirty five patients with vitiligo and thirty five age and sex matched controls presented to Dermatology OPD in tertiary care hospital, Ballari. Duration of study was January to December 2021. Ethical clearance was obtained from Institutional Ethical Committee (IEC).

Inclusion criteria:

All clinically diagnosed cases of vitiligo aged above 18 years.

Exclusion criteria:

1. Age younger than 18 years.
2. Patients on folic acid, vitamin B12 and homocysteine supplement.
3. Patients who have undergone gastrointestinal surgery.
4. Cigarette smoking, alcohol intake and hormonal therapy.

Investigations:

After explaining the procedure and obtaining written informed consent from every patient and control, a 5 ml of venous blood were drawn from each participant. The serum levels of vitamin B12 and folic acid were measured using the electro chemiluminescence immunoassay method (RocheE411, Germany). Other investigations like Complete hemogram with peripheral smear, Random blood sugar, Liver and Renal function tests, Thyroid function test, Urine Routine examination were done wherever necessary.

STATISTICAL ANALYSIS: Study subjects were entered in excel spread sheet and analysed using statistical package for the social sciences software version (SPSS) 20.0. Mean and standard deviation (SD) were calculated for continuous parameters. Unpaired student's t test was used to compare quantitative variables and chi square test was used to compare qualitative variables. P value <0.05 was considered statistically significant.

RESULTS

The mean age among cases was 38.11 ± 13.14 years, mean age among controls was 37.86 ±12.82 years. Male to female ratio among cases and controls was 1.5:1 and 1.9:1 respectively. Maximum number of patients presented within 6-12 months of onset of their disease.

Table 1: Serum levels of vitamin B12 in study subjects

Serum marker	Group	N	Mean	SD	Student's t-test	P value	Inference
Vitamin B12 (pg/ml)	Cases	35	376.93	283.04	1.098	0.27 (>0.05)	Not significant
	Controls	35	318.66	135.68			

Serum vitamin B12 level was low in 20% of patients versus 14.28% of controls, and normal in 80% of patients versus 85.71% of controls. There was no statistically significant difference in serum levels of vitamin B12 between patients and controls.

Table 2: Serum levels of folic acid in study subjects

Serum marker	Group	N	Mean	SD	Student's t-test	P value	Inference
Folic acid (ng/ml)	Cases	35	9.74	6.28	0.722	0.47 (>0.05)	Not significant
	Controls	35	8.75	5.10			

Serum folic acid level was low in 31.42% of patients versus 20% of controls and normal in 68.57% of patients versus 80% of controls. There was no statistically significant difference in serum levels of folic acid between patients and controls.

There was no statistical significant difference in the serum levels of vitamin B12 between male and female patients.

There was no statistical significant difference in the serum levels of folic acid between male and female patients.

There was no statistical significant difference in the serum levels of vitamin B12 between male and female controls.

Serum levels of folic acid in male and female controls. There was no statistical significant difference in the serum levels of folic acid between male and female controls.

Table 3: Serum levels of vitamin B12 in different types of vitiligo

Serum markers	Vitiligo type	N	Mean	SD	F-test	P value	Inference
Vitamin B12 (pg/ml)	Acral	3	554.333	254.3705	1.540	0.215 (>0.05)	Not significant
	Acrofacial	11	422.127	303.1093			
	Focal	6	366.000	145.1744			
	Mucosal	5	507.400	520.1397			
	Vitiligo vulgaris	10	215.300	51.7130			
	Total	35	376.926	283.0374			

There was no statistically significant relation between serum vitamin B12 levels and types of vitiligo.

Table 4: Serum levels of folic acid in different types of vitiligo

	Vitiligo type	N	Mean	SD	F-test	P value	Inference
Folic acid (ng/ml)	Acral	3	20.0700	3.40510	3.088	0.030 (<0.05)	Significant
	Acrofacial	11	9.5127	5.75388			
	Focal	6	7.8517	6.79860			
	Mucosal	5	6.6320	0.54187			
	Vitiligo vulgaris	10	9.5860	6.34441			
	Total	35	9.7423	6.27654			

Serum folic acid level was above the normal range in all types of vitiligo. There was a statistically significant relation between serum levels of folic acid and types of vitiligo.

There was no statistical significant difference in serum levels of vitamin B12 in patients with stable and active vitiligo.

Table 5: Serum levels of vitamin B12 in patients with stable and active vitiligo

Serum markers	Disease activity	Mean	SD	Student's t-test	P value	Inference
Vitamin B12 (pg/ml)	Stable	445.14	321.97	0.899	0.375 (P>0.05)	Not significant
	Active	349.64	268.14			

There was no statistical significant difference in serum levels of folic acid in patients with stable and active vitiligo.

Table 6: Serum levels of folic acid in patients with stable and active vitiligo

Serum markers	Disease activity	Mean	SD	Student's t-test	P value	Inference
Folic acid (ng/ml)	Stable	10.08	6.94	0.200	0.843 (P>0.05)	Not significant
	Active	9.61	6.14			

There was no statistical significant difference in serum levels of folic acid in patients with unilateral and bilateral vitiligo.

There was no statistical significant difference in serum levels of folic acid in patients with unilateral and bilateral vitiligo.

Table 7: Serum levels of vitamin B12 in patients with vegetarian and mixed diet

Serum markers	Diet	N	Mean	SD	Students 't' test	P value	Inference
Vitamin B12 (pg/ml)	Vegetarian	18	403.24	286.98	0.560	0.579 (>0.05)	Not significant

	Mixed	17	349.06	284.82			

There was no statistically significant difference in the serum levels of vitamin B12 in patients with vegetarian and mixed diet.

Table 8: Serum levels of folic acid in patients with vegetarian and mixed diet

Serum markers	Diet	N	Mean	SD	Students 't' test	P value	Inference
Folic acid (ng/ml)	Vegetarian	18	9.68	6.01	-0.057	0.955 (>0.05)	Not significant
	Mixed	17	9.81	6.73			

There was no statistically significant difference in the serum levels of folic acid in patients with vegetarian and mixed diet.

DISCUSSION

Sabry et al[8]reported a mean age of 37.03±10.85 years for cases, and 33.87± 8.09 years for controls. Agarwal et al[9] reported mean age of patients to be 32.74±10.52 years (P value= 0.757). The mean age group observed in present study matches with the above studies. In the present study, Mean duration of disease was 48.80 (± 91.94) months ranging from 1 month to 360 months. Karadag et al[10] reported mean duration of disease to be 25.5±35.3 months ranging from 1 month to160 months.

Karadag et al[10] reported vitiligo vulgaris as the most common type followed by focal vitiligo. These differences may be due to the variation in ethnic, racial, genetic or environmental factors in different parts of the world.

In this study, disease was stable in 28.6% and active in 71.4% of patients. Ghiasi et al[11] noted stable disease in 36.7%and active disease in 63.3% of patients of patients.

Similar to our study, Ghiasi et al[11] reported disease involvement to be bilateral in 86.2% and unilateral in 13.8% of patients.

In this study there was no significant difference in serum levels of vitamin B12 and folic acid between vitiligo patients and healthy controls. Consistent with our results, Ghiasietal[11], Balcietal[7]and Kimetal[2] reported no significant difference in the serum levels of vitamin B12

and folic acid between vitiligo patients and controls. Similarly, Yasar et al[12] also found no significant difference in vitamin B12 in vitiligo patients compared to healthy individuals. In contrast to the present study, Singhetal[13]reported that in comparison with healthy individuals, patients with vitiligo had lower levels of serum vitamin B12 and folic acid. Similarly, Karadagetal[10]also showed lower vitamin B12 levels in the serum of patients with vitiligo compared to healthy subjects, but failed to show any difference in the serum folic acid levels. However, El-Dawela et al[14] indicated that vitamin B12 and folic acid levels were not different in the two groups. The reason for these contradictory results is not clear.

Table 9: Comparison of serum vitamin B 12 levels in case and controls among various studies

Various studies	Vitamin B12(pg/ml)		P value
	cases	controls	
Present study	376.93±283.04	318.66±135.68	0.27
Singh et al[13]	428.46±133.52	536.63±111.43	0.000
Agarwal et al[9]	157.18±68.95	306.6±169.73	0.000
Sabry et al[8]	208.64±6.73	304.7±89.9	0.001
Karadag et al[10]	250.6±112.4	316.5±152.0	0.01

*Data presented as median, inter quartile range

Table 10: Comparison of serum folic acid levels in case and controls among various studies

Various studies	Folic acid(pg/ml)		P value
	cases	controls	
Present study	9.74±6.28	8.75±5.10	0.47
Singh et al[13]	4.88±1.52	6.25±0.69	0.000
Agarwal et al[9]	4.18±3.55	7.3±3.67	0.000

Sabry et al[8]	8.42±2.06	9.39±2.38	0.149
Karadag et al[10]	7.5±3.1	7.0±2.2	0.30

*Data presented as median, inter quartile range

In present study, there was no significant difference in serum folic acid and vitamin B12 levels between male and female vitiligo patients. The results obtained were in accordance with study conducted by Singh et al[13] who reported no significant difference in serum vitamin B12 and folic acid levels between male and female patients. In the present study, No significant relation was found between vitamin B12, folic acid levels in male and female controls.

In the present study, no statistically significant relation was found between serum levels of vitamin B12, folic acid and patients on vegetarian and mixed diet. The results obtained were in accordance with the study conducted by Agarwal et al[9] (P =0.377).

CONCLUSION

In the present study, no significant difference was found in serum levels of vitamin B12 and folic acid between vitiligo patients and controls**.** Another area to be explored is the therapeutic effect of vitamin B12 and folic acid supplementation on progression of the disease.

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