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Effect of Protein and Vitamin C Supplementation with Lifestyle Modification Counselling on Biochemical Parameters of Male Tuberculosis Patients

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Abstract: ***The aim of the present study was to assess the effect of protein and vitamin C supplementation with lifestyle modification counselling on biochemical parameters of male tuberculosis patients. To conduct the study, 150 male subjects suffering from pulmonary tuberculosis were selected randomly. The age range of subjects was 25 to 50 years. Standard laboratory and clinical methods were used to assess serum albumin, globulin and serum total protein in selected male pulmonary tuberculosis patients. FANTASTIC LIFESTYLE ASSESSMENT CHECKLIST was used to assess the lifestyle of male pulmonary tuberculosis patients. Subjects were given protein (two boiled eggs) and vitamin C (eight amla candies) per week supplementation for three months along with counselling on lifestyle modifications for better treatment outcomes. Results revealed significant improvement in biochemical parameters of male tuberculosis after three months of protein and vitamin C supplementation along with lifestyle counselling. It was concluded that protein and vitamin C supplementation coupled with lifestyle modification counselling is effective in enhancing biochemical markers in male pulmonary tuberculosis patients.***
Keywords: Tuberculosis, protein and vitamin C, supplementation, Lifestyle, Biochemical markers

I. INTRODUCTION

Communicable disease tuberculosis is second leading cause of mortality in the world. As per WHO estimates there were 2.79 million cases of tuberculosis in India. It has been reported that roughly 40% adult population is infected with mycobacterium tuberculosis. Based on National survey for Annual Risk of Tuberculosis Infection (ARTI) which is 1.5%, the incidence of new smear positive tuberculosis cases in the country is estimated as 75 new smear positive tuberculosis cases per 1,00,000 populations. Although tuberculosis is preventable and curable it remains a potent disease affecting millions of people and even results in significant numbers of mortality.

To address this issue of treatment of tuberculosis, modern medical science comes with an effective drug for treatment of tuberculosis. Apart from conventional vaccine it has been advocated that protein and vitamin C supplement and lifestyle modification are useful in enhancing the biochemical parameters of subjects suffering from tuberculosis. To scientifically judge the effectiveness of protein and vitamin C supplementation along with lifestyle modification counselling on biochemical parameters of pulmonary tuberculosis patients, the present study was planned.

II. REVIEW OF LITERATURE

Studies conducted by Ahmed et al. (2011), Narwadiya et al. (2012), Naquash and Bhat (2016) indicate that serum IgG and IgA levels are associated with pulmonary tuberculosis patients. Ramesh et al. (2011), Ali et al. (2014), Tyagi et al. (2017) examined the role of thiamine, biotin, Vitamin C, and Vitamin D in management of tuberculosis. Pérez-Guzmán et al. (2005), Bhargava et al. (2013), Rudolph et al. (2013) studied the requirement of nutritional support in treatment of tuberculosis.

Few studies such as Khan et al. (2012), Howyida et al. (2012) evaluated the impact of counselling on nutritional knowledge of tuberculosis. Review of previous studies indicate that although role of vitamin C, protein supplementation and counselling has been studied but not in a single study. Hence the present study was planned to assess the effect of protein and vitamin C supplementation with lifestyle modification counselling on biochemical parameters in male tuberculosis patients.

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A. Objectives

The main objective of the present study is to assess the effect of protein and vitamin C supplementation with lifestyle modification counselling on biochemical parameters namely serum albumin, serum globulin and serum total protein levels in male tuberculosis patients.

III. MATERIALS AND METHODS

1) *Sample:* The population for the present study were male tuberculosis patients enrolled in various government hospitals in Raipur city. Out of these, 150 male subjects suffering from pulmonary tuberculosis were selected randomly. The age range of subjects was 25 to 50 years. Only sputum positive pulmonary tuberculosis patients were included.
2) *Tools*

a) *Biochemical Measurements:* Standard laboratory and clinical methods were used to assess serum albumin, globulin and serum total protein in selected male pulmonary tuberculosis patients. Written consent was taken by patients. Blood sample was collected before the commencement of study period. Similarly blood sample was collected after the completion of study period. The samples were analysed in pathology lab and values as certified by pathologists were noted. Protein Analyzer Machine (300 Merck Com) was used for assessment of serum albumin, serum globulin and serum total protein respectively.

b) *Life style Assessment:* Fantastic Lifestyle Assessment Checklist was used to assess the lifestyle of male pulmonary tuberculosis patients. The Fantastic Lifestyle Assessment Tool by Dr Douglas Wilson Department of family Medicine comprises of FANTASTIC means F - Family/friends, A – Activity, N – Nutrition, T – Tobacco, A - Alcohol, S – Sleep, T – Temperament/personality, I – Insight and C - Career

3) *Design:* Pre-post single group experimental design was preferred to conduct the study.

a) *Interventions:* Subjects were given protein (two boiled eggs) and vitamin C (eight amla candies) per week supplementation for three months along with counselling on lifestyle modifications for better treatment outcomes.

4) *Method and Procedure:* First of all, 150 male tuberculosis patients were selected. Biochemical measurements were taken before the commencement of the study period. Similarly lifestyle checklist was administered to each subjects before the commencement of study period. After three months of supplementation and lifestyle counselling post test data on biochemical measures and lifestyle checklist was again collected. Paired sample 't' test was used to analysis the pre-post data on studied variables. The difference in pre-post mean scores (gain score) on lifestyle modification check list and biochemical parameters were also correlated with each other. The results are presented in table 1, 2, 3 and 4 respectively.

IV. RESULT AND DISCUSSION

Table 1
Comparison of Pre-Post Mean Scores on Biochemical Measures of Male Tuberculosis Patients

Biochemical Variables	N	Pre Test		Post Test		Mean Difference	't'
		Mean	S.D.	Mean	S.D.		
Serum Albumin (g/dL)	150	3.09	0.36	3.79	0.35	0.69	27.11**
Serum Globulin (g/dL)	150	2.64	0.53	2.94	0.45	0.29	11.51**
Serum Total Protein (g/dL)	150	5.74	0.70	6.73	0.67	0.99	29.48**

** Significant at .01 level; t(df=149) at 0.05 = 1.98, t(df=149) at 0.01 = 2.60

A perusal of table 1 indicate a significant increase in post test mean serum albumin values (M=3.79) among male pulmonary tuberculosis patients as compared to their pre test mean serum albumin values (M=3.09). The calculated t=27.11 also supports this findings at .01 level of statistical significance because it is greater than the table value of 2.60 for df=149.

A perusal of table 1 indicate a significant increase in post test mean serum globulin values (M=2.94) among male pulmonary tuberculosis patients as compared to their pre test mean serum globulin values (M=2.64). The calculated t=11.51 also supports this findings at .01 level of statistical significance because it is greater than the table value of 2.60 for df=149.

A perusal of table 1 indicate a significant increase in post test mean serum total protein (M=6.73) among male pulmonary tuberculosis patients belonging to experimental group as compared to their pre test mean serum total protein (M=5.74). The calculated t=29.48 also supports this findings at .01 level of statistical significance because it is greater than the table value of 2.60 for df=149.

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Table 2
Comparison of Pre-Post Mean Scores on Lifestyle Modification Scores of Male Tuberculosis Patients

N	Lifestyle				Mean Difference	't'
	Pre Test		Post Test			
	Mean	S.D.	Mean	S.D.		
150	34.61	18.99	41.70	16.62	7.08	13.13**

** Significant at .01 level; t(df=149) at 0.05 = 1.98, t(df=149) at 0.01 = 2.60

A perusal of table 2 indicate a significant increase in post test mean scores on lifestyle modification scale (M=41.70) among male pulmonary tuberculosis patients as compared to their pre test mean score of 34.61. The calculated t=13.13 also supports this findings at .01 level of statistical significance because it is greater than the table value of 2.60 for df=149.

Table No. 3

Relationship between Biochemical Parameters with Lifestyle Modification among Tuberculosis Patients

	N	Albumin	Globulin	Total Protein
Lifestyle Modifications	150	.15**	.17**	.19**

r with df(148) = .149 and .208 at .01 level

A perusal of entries shown in table 3 clearly indicate that changes in lifestyle modification yields positive results as far as increase in albumin, globulin and total protein is concerned. When correlation of gain score of lifestyle change was correlated with albumin, globulin and total protein, the resultant r=.15, p<.01, r=.17, p<.01 and r=.19, p<.01 respectively indicate that positive lifestyle yields also reflects positively on biochemical parameters of pulmonary tuberculosis patients.

A. Results

1) Significant improvement in biochemical parameters namely serum albumin, serum globulin and serum total protein along with lifestyle modification counselling was observed in male pulmonary patients after three months of protein and vitamin C supplementation along with lifestyle modification counselling.

2) Positive lifestyle yields also reflected positively on biochemical parameters of pulmonary tuberculosis patients.

B. Discussion

In the present study it was observed that biochemical parameter i.e. serum total protein levels of pulmonary tuberculosis has enhanced significantly after dietary supplementation of egg and amla along with lifestyle counselling for three months. The effect of egg yolk added diet in treatment of pulmonary tuberculosis has been highlighted by number of researchers. One such study indicates that supplementation of egg yolk result in faster recovery in terms of sputum production. (Pérez-Guzmán et al. 2005) The health benefits of amla is due to its high vitamin C content. Consumption of amla is beneficial for more effective food absorption, balancing stomach balances, liver fortification, brain and mental functioning. It also regulates free radical apart from giving strength to lungs. Amla improves muscle tone and act as antioxidant. Madebo et al. (2003) established a positive relation between vitamin C deficiency and tuberculosis. The clinical severity in tuberculosis is due to lack of concentration of antioxidants. When supplemented with vitamin C, the production of hydroxyl radicals which reduces the chance of cell deaths. (Vilcheze, 2013) The other finding showed that subject's scores on lifestyle checklist was also improved after counselling. It indicate that they are more aware of ill effects of tobacco, alcohol apart from importance of nutrition, sleep, psychological balance in better treatment outcomes of tuberculosis treatment. This may be the reason that gains in lifestyle checklist also reflected in gain in biochemical parameters.

V. CONCLUSION

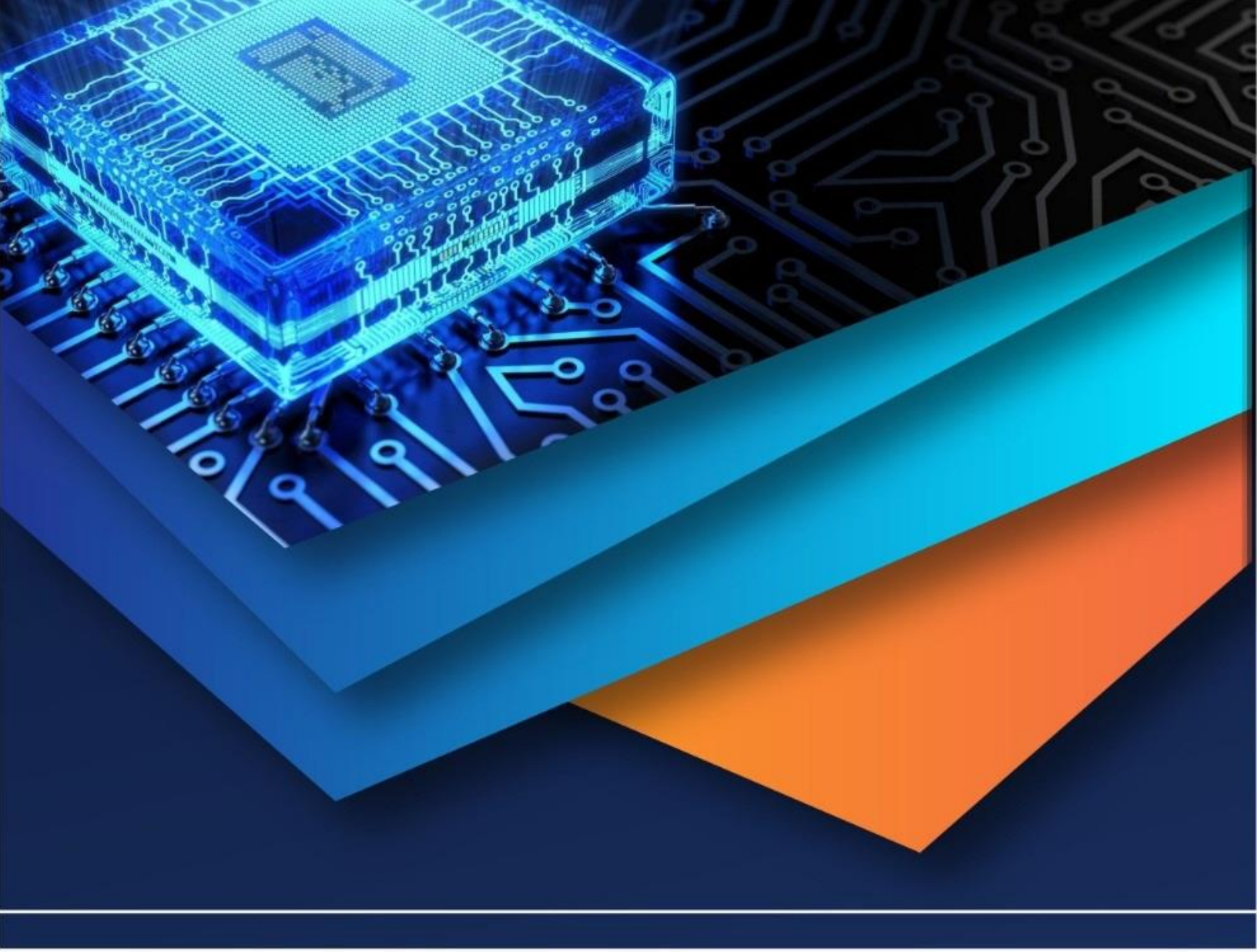
On the basis of results it may be concluded that vitamin C and protein supplementation in the form of eggs and amla for a specific duration along with lifestyle modification counselling is beneficial in improving serum total protein levels in male tuberculosis patients.

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