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Role of Liv.52 in the treatment of malabsorption syndrome

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INTRODUCTION

The term 'malabsorption syndrome' is non-specific and would seem to include diseases in which some abnormality of absorption exists. Though they may be of varied aetiology, most of them resemble each other and exhibit protein, carbohydrate, fat, minerals and vitamins deficiency. The clinical manifestations are similar to the disease known as `Sprue' that is why the term malabsorption syndrome is also referred to as Sprue Syndrome.

Patients of malabsorption syndrome are usually grouped into three categories: (1) Non-tropical Sprue (NTS) also known as coeliac disease, idiopathic steatorrhoea and gluten-induced enteropathy (2) Tropical Sprue and (3) Secondary malabsorption. Till recently non-tropical sprue was considered to be prevalent only in nontropical countries but Misra *et al.* (1966) have reported its occurrence in tropical countries also. Of course, Tropical Sprue is more common in India. Much work has been done on Tropical Sprue as reviewed by Klipstein (1968 and 1970), Baker (1970 and 1972) and Lindenbaum (1973) but it is interesting to learn that the aetiology, pathogenesis and clinical symptoms of this disease were documented in 500 B.C. by Charak.

The true aetiology of T.S. remains one of the outstanding conundrums in tropical medicine. This statement made by Manson Bahr (1953) holds good even to this day. However, many workers have put forth various causative factors such as (i) infection (ii) nutritional deficiency (iii) disturbed intestinal microflora (iv) blood dyscrasia and (v) immunological changes.

It is an established fact that in most of the developing countries of Asia, a subclinical stage of enteropathy is widely prevalent (Klipstein 1970), and in addition to primary malabsorption there are a large number of cases of secondary malabsorption. Inflammatory disease of small intestine and parasitic infestations produce functional derangement and contribute to the development of chronic diarrhoea and the malabsorption syndrome. Among the parasitic infestations Giardiasis (Veghlyi 1940, Kyser 1941, O'Donvan *et al.* 1942, Kalsmpes *et al.* 1944, Cortner 1959, Count *et al.* 1959, Takano *et al.* 1965, Hoskins *et al.* 1967, Morecki *et al.* 1967, and Ament *et al.* 1972) and ankylostomasis (Rotter 1931, Darke 1959, Sheehy *et al.* 1962, Banwell 1962, Gilles *et al.* 1964, Tandon *et al.* 1966 and Chuttani *et al.* 1967) which derange intestinal lining (mucosa), are very common in the tropical countries. It is difficult to differentiate these cases from T.S.

In all types of malabsorption, morphological changes in the mucosa of the entire gastro-intestinal tract are reported, including significant atrophic changes in the microvilli of the jejunum which lead to defective absorption of fat, carbohydrate, protein, vitamins and minerals.

Endocrinopathy in Gastro-intestinal Disorders

It has been suggested that the synthesis and release of pituitary hormones is linked with protein deficiency; and the decrease in gonadotrophin which alters reproductive physiology also results from protein deficiency, which may either occur due to malnutrition or malabsorption. Similar is the case with the thyroid. It has been reported to be suppressed in malnutrition and malabsorption. The suppression is because of the protein deficiency and is reversible with the administration of high protein diet.

Classical Concept in Indian Medicine

It is envisaged by ancient physicians of India in the texts of Indian Medicine that there is hypofunctioning of gastro-intestinal functions including the digestion and absorption in the patients of *Grahani* (malabsorption syndrome). In addition, the hormones and enzymes (*Agni*) taking part in metabolism are also reduced in this disease. For correction of both digestive and metabolic agents simple herbal drugs acting on the G.I. tract have been advocated. Many of these drugs are included in Liv.52.

Hence the role of Liv.52 in the correction of digestion and metabolism in patients of malabsorption has been assessed in this paper.

MATERIAL AND METHODS

Selection of cases

Thirty adult patients of both sexes suffering from malabsorption presenting with symptoms of loose motions, flatulence, loss of appetite, indigestion of chronic origin and loss of weight were selected from the O.P.D., of Sir Sunderlal Hospital, B.H.U. and were admitted as indoor patients for investigation. During this period they were kept on normal hospital diet and placebo.

Parameters for Investigation

Two sets of investigations were done: (1) Group I: In this group the severity of malsecretion and malabsorption was assessed and (2) Group II: In this group the effect of malabsorption and malsecretion on the general body condition and on the thyroids was assessed.

(I) *Assessment of gastro-intestinal function*
- (1) Repeated microscopic examination of the stool.
- (2) Fractional Test Meal (F.T.M.) for indigestion.
- (3) D-Xylose absorption: for malabsorption.
- (4) Jejunal Biopsy: for malabsorption.

(II) *Assessment of general body condition and thyroid function*
- (1) Serum Protein g%
- (2) Haemoglobin g%
- (3) I^{131} up-take study: for thyroid function.

Repeated stool examination was done according to Kolmer's (1969) method. For the fractional test meal (F.T.M.), Topher's method of chemical analysis was applied as described by Kolmer (1969). Roe and Rice's method was followed for the D-Xylose absorption test as given by King (1964). For the study of jejunal biopsy, Watson intestinal biopsy capsule technique was followed. Paraffin Section of (5μ) of jejunum were made and stained in haematoxylin and eosin for studies connected with changes in the mucosa, the changes in the pattern of the microvilli were recorded. Schenk *et al.,* (1972) method was followed for the assessment of the jejunal microvilli pattern. For the assessment of general body conditions, serum protein g% by Biuret method (King, 1964) and haemoglobin g% by Sahli's method (Kolmer, 1969) were employed. Assessment of thyroid function was done by I^{131} uptake percentage study by the method described by Veall and Vetter.

For the clinical trial, the patients were divided into three groups. Group I was kept on Liv.52 syrup, 2 teaspoonfuls four times a day, Group II received Liv.52 syrup in the same dose along with specific treatment of the parasites and Group III received only specific treatment. The trial was continued for a period of one month. D-Xylose absorption, Serum protein and Serum haemoglobin and I^{131} up-take were repeated at the end of the trial.

OBSERVATIONS AND RESULTS

Age and Sex

Out of thirty patients, 17 were males and 13 females. About 50% of patients were around 30 years of age and rest of them ranged from 10 to 50 years.

Clinical Features

General symptoms in these cases were loose motions, pain in the abdomen, indigestion and loss of appetite. Constitutional symptoms were loss of weight, emaciation, weakness, mild headache and vertigo. However, the typical characteristics of Tropical Sprue (T.S.) such as glositis, stomatitis, pernicious anaemia etc. were present only in a few cases. Some showed evidence of severe anaemia (nutritional) and oedema indicating severe lesions.

Diagnosis

Diagnosis was by repeated stool examinations and was based on standard clinical recordings. If parasites were identified, then those cases were classed as "secondary malabsorption". The remaining were taken as Tropical Sprue (T.S.). The clinical diagnosis was further confirmed by D-Xylose absorption and jejunal biopsy tests.

It becomes evident from Table 1 that more than 50% cases having symptoms of malabsorption were suffering from parasitic infestation.

Table I: Showing the type of malabsorption in 30 cases

Group		Primary malabsorption T.S.	Secondary malabsorption	
			Giardiasis	Mixed Parasitic Infestation
I	Liv.52	6	3	1
II	Liv.52 with specific treatment	3	5	2
III	Specific treatment	3	3	4
Total		12	11	7

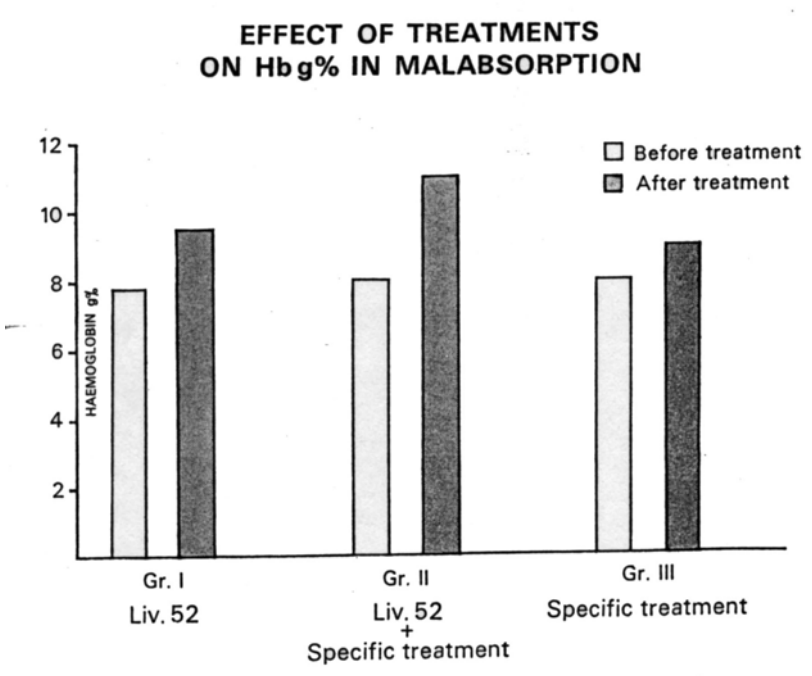


Table II: Effect of treatment on haemoglobin in malabsorption

Group	Average HB g%		Rise in Hb g%	P
	Before treatment	After treatment		

Group I	7.82	9.52	1.70	P < 0.001
Group II	8.05	11.00	2.95	P < 0.001
Group III	8.05	9.10	1.05	P < 0.001

Table III: Effect of treatment on serum protein in malabsorption

Group	Average S. Protein		Rise in g%	S.D.	P
	Before treatment	After treatment			
Group I	4.36	5.00	0.64	±0.707	P 0.05
Group II	4.75	6.06	1.31	±0.825	P 0.01
Group III	5.44	6.00	0.56	±0.441	P 0.01

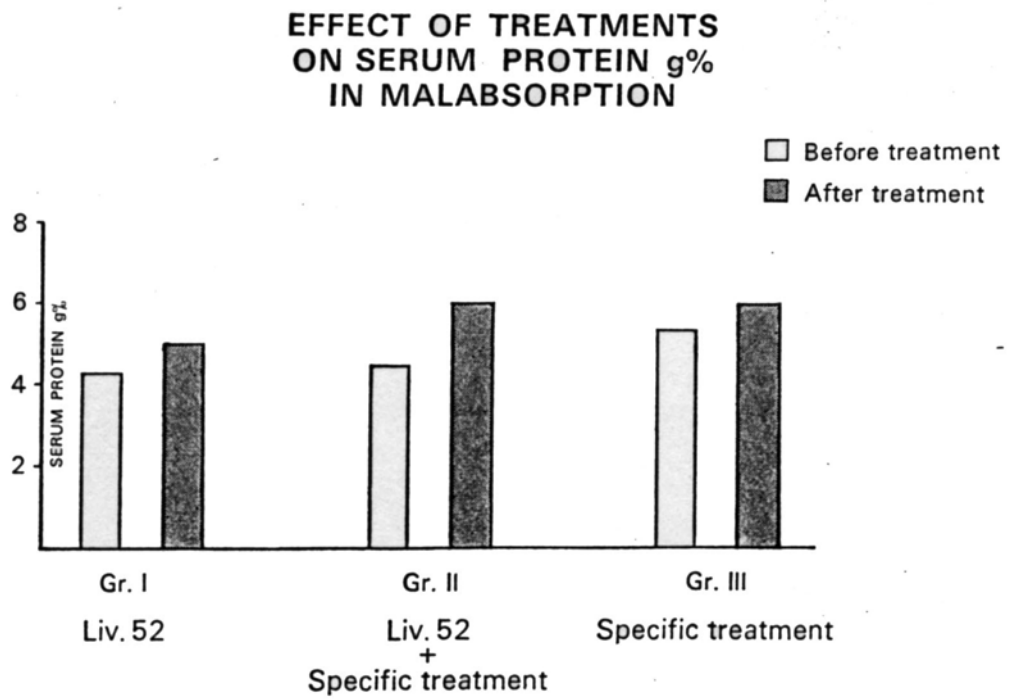


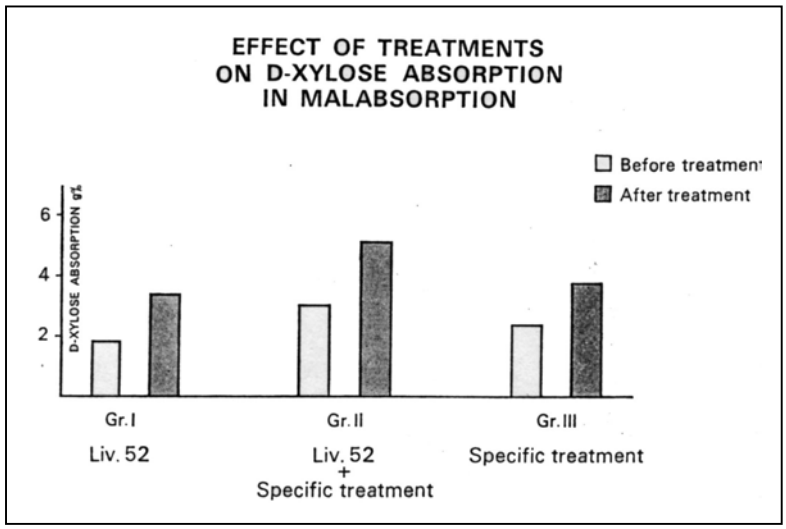
Table IV: Effect of treatment on D-Xylose in malabsorption

Group	Average D-Xylose		Rise	S.D.	P
	Before treatment	After treatment			
Group I	1.73	3.42	1.687	±0.415	P 0.001
Group II	3.024	5.13	2.106	±0.293	P 0.001
Group III	2.409	3.80	1.99	±0.480	P 0.001

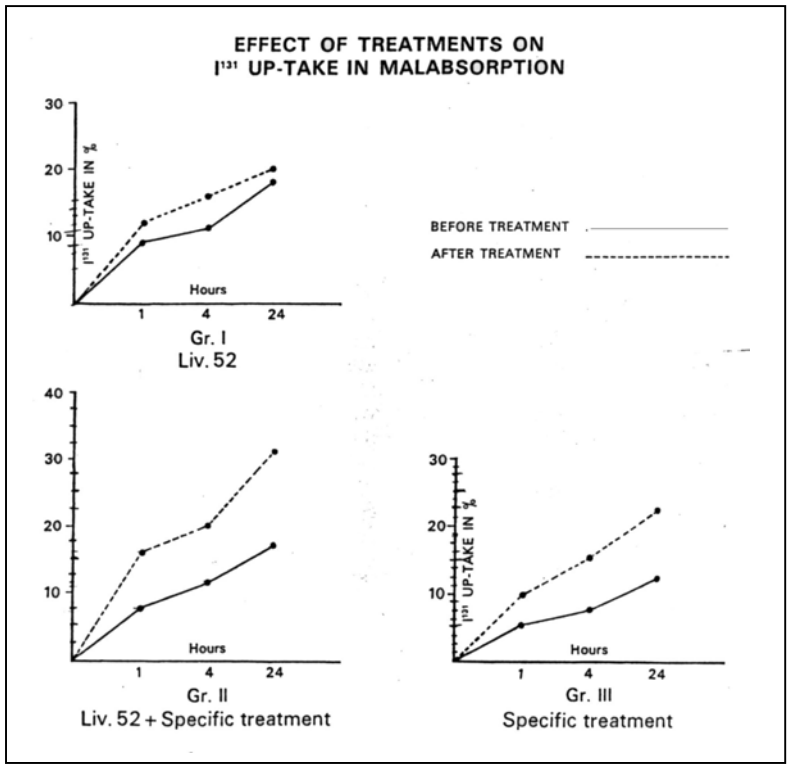
Table V: Effect of treatment on I^{131}% uptake in malabsorption

Group	Average I^{131}% uptake after 24 hrs		Rise in I^{131}% uptake	S.D.	P
	Before treatment	After treatment			
Group I	18.75	20.07	1.32	±3.65	P < 0.05
Group II	17.10	31.08	13.98	±4.84	P < 0.001
Group III	12.06	22.51	10.50	±2.52	P < 0.001

It is obvious from the Table that D-xylose absorption was very poor in the patients of all the three groups. In addition, jejunal biopsy revealed different grades of atrophic changes in all these cases. As a consequence, serum protein was also low. Thus the diagnosis of malabsorption was confirmed.



When these patients were put on treatment i.e. Liv.52, Liv.52 along with specific treatment and specific treatment alone respectively in Groups I, II and III, there was all-round improvement. The rate of D-Xylose absorption improved with regeneration of microvilli (Figs. 1-4), and as a consequence there was improvement in serum protein and haemoglobin. This led to the improvement in thyroid function as evidenced by increased I^{131} uptake after treatment. Regarding the comparison of the results in different groups, the best result has been obtained in the group on Liv.52 combined with the specific treatment.



DISCUSSION AND CONCLUSION

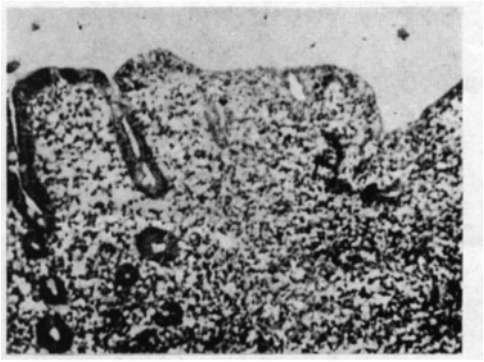
Liv.52 has been found to improve absorption in malabsorption patients as indicated by improvements in D-Xylose absorption and regeneration of microvilli. In parasitic infestation it is a definite advantage to administer Liv.52 along with specific treatment for better recovery in digestion and metabolism.

The ingredients of Liv.52 which are known to improve liver function and appetite are sure to improve the digestion offering a better opportunity for absorption. Once the absorption is improved it helps in regeneration of microvilli which further improves absorption capacity. The anabolic activity claimed for Liv.52 is also through the same mechanism.

Histological Changes in Microvilli of Jejunum

Before and After Treatment with Liv.52 in Patients of Malabsorption

Fig. 1
Before treatment



Shows the pseudoatrophy of microvilli, Grade IV changes in a patient of malabsorption due to giardiasis.

Fig. 2
After treatment

Shows the regeneration of microvilli after one month's treatment with Liv. 52 and specific treatment.

Fig. 3
Before treatment

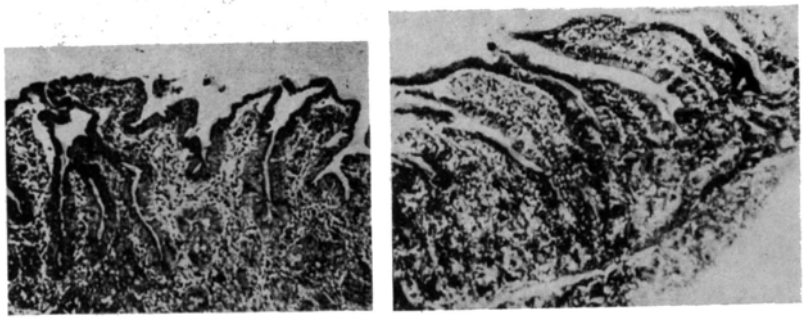
Shows the fusion of microvilli along with broadening and shortening. Grade III changes in a patient of secondary malabsorption suffering from giardiasis.

Fig. 4
After treatment

Showing the regeneration of microvilli after treatment with Liv.52 and specific therapy.

Fig. 5
Before treatment

Fig. 6
After treatment



The pattern of villi has improved towards normalcy

I^{131} uptake has been found to be below normal before treatment in patients of malabsorption. After treatment it is significantly raised and brought within normal range. This is an interesting finding. Hypofunctioning of the thyroid in malabsorption is also known to be due to hypoproteinemia (Ramalingaswami 1964) Milner (1972) pointed out that I^{131} uptake decreases in protein deficient animals. Similarly, Donati *et al.* (1963) opined that protein insufficiency causes oxygen depression resulting in decreased release of iodine from the gland. Ingenbleek *et al.* (1973) have shown that a very advanced stage of protein deficiency may lead to iodine deficiency and this in turn may bring about goitre formation.

In addition to functional changes, morphological changes in the thyroid gland in malnourished animals have been reported. In calorie-deficient monkeys large colloid follicles lined by flattened cuboidal cells were seen. Occasionally diffusion of two follicles has also been observed (Enwon Wu *et al.* 1975). Thus the suppression of the thyroid is well documented in protein deficiency. With the improvement in digestion and absorption brought about by Liv.52, serum protein has been raised and consequently the thyroid function has also improved.

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