

A STUDY ON THE EFFECT OF YOGA THERAPY ON LIVER FUNCTIONS

Dr. K. Krishna Sharma, M.A., M.Sc, PhD, PGDYT

Dr. Udayakumara K, M.Sc, PhD

Dr. Thirumaleshwara Prasada H, M.Sc, PhD

Praveen Kumar K, M.Sc.

Mangalore University, Mangalagangothri, India

Abstract

The present study entitled "The effect of Yoga Therapy on Liver functions" is conducted in the Department, Mangalore University, Karnataka. Twenty employees were selected randomly for the present study and divided into two groups. Viz, Experimental and Control, between the age group of 20 and 50. Yogic practices were given only to the experimental group for a period of one and half months. In order to check the level of significance of mean, a student paired t- test was made use of. The study revealed that the globulin was reduced up to highly significant level and alkaline phosphate and weight was reduced significantly at the level of p – value 0.00087, 0.0364, 0.0424 respectively (at p – value 0.005). But there were no significant changes in the control group.

Keywords: Liver, Yoga Therapy, Globulin

Introduction

Liver is an extremely important organ in the body. It plays a vital role in homeostasis and healthy functioning of the body. The present world is becoming more and more materialistic because of globalization and urbanization. Man has to face tough competition and tension and run the risk in his strive to achieve comfortable life. This leads to several psychosomatic disorders. The poor functioning of the Liver is due to change of Life-style, wrong dietary habits, lack of physical activity, smoking, alcohol consumption, drugs etc. Also, liver disorders like, Jaundice, Cirrhosis, Hepatitis, can bring change in the albumin and globulin levels. One of the ways out is the practice of *Yoga*, which soothes both mind and body. Yoga therapy is a method, where the treatment is done through *Yogic* practices. At present, the health awareness is increasing day by day and the treatment

without medicine is preferred everywhere. Hence Yoga therapy could be used for the better health of Individuals.

Materials and Methods:

The present study was conducted to find out the effect of Yoga therapy on liver functions in Industrial employees of the age group between 20 and 50. Twenty employees were selected randomly for the current study. They were divided into two groups. Viz, *experimental* and *Control* equally based on simple random sampling method. Yoga Therapy was given only to the experimental group and their results were compared with Control group. Daily sessions were taken in the evening for about one hour. The Yogic practices include a series of *Āsana*, *Prāṇāyāma* and *Yoganidrā* for thirty minutes. The data was analyzed using Student paired t-test, to find out the significance of the result.

The following parameters were included in the present study.

Globulin

Globulins are the proteins that can be divided into three fractions: Alpha (α), Beta (β) and Gamma (γ). α & β fractions are produced in the liver but γ is produced by cells of Immunity system. Alpha globulins transport many Hormones, including Cortisol and Thyroxin. The β globulins are important in the transport of lipids (eg, Cholesterol), fat – soluble Vitamins (A, D, K), Insulin and Iron. The ability to fight infections depends on the Gamma globulin (Immunoglobulin). Normal range of globulin is 2.3 – 3.5 g/dL. This will be elevated in chronic infections like – Liver disease, Rheumatoid Arthritis, Ulcerative Colitis, Autoimmune disease and kidney dysfunction.

Alkaline Phosphatase

Alkaline Phosphatase is a hydrase enzyme responsible for removing phosphate group from many types of molecules, including nucleotides, proteins and alkaloids. It is present in all tissues through the entire body particularly concentrated in Liver, bile duct, kidney, bones and placenta. It is a byproduct of osteoblast activity. This enzyme is released into the blood by the liver in response to certain diseases, by the bone for healing during fractures. Any condition that affects bone growth or causes increased activity of bone cells can affect ALP level in blood. Normal range of Alkaline Phosphate (ALP) in adults are 60- 170 U/L. High level of ALP in adults usually indicates the damaged liver, Hepatitis, bone diseases (Paget's disease), liver cancer, use of Anti-epileptic drugs and during Pregnancy.

Yogic Intervention

The following Yogic practices were given to experimental group for a period of one and half months. *Āsana* like – Svastikāsana, Vajrāsana, Supta Vajra, Tāḍāsana –I, Trikonāsana, Pārśvakona, Purvottānāsana, Pavanamukta, Bhujangāsana, Dhanurāsana, Maricāsana –I, Vagrāsana. *Prāṇāyāma* like – Ujjayi, Anuloma – Viloma, Bhastrikā. *Yoganidrā*, a deep relaxation technique.

Data Collection

The data collection were done by recording one's detailed Case History - main complaints, history of past and present illness, family history, appetite, sleep, micturition, bowel movement, M.C., Pregnancy. Lab investigations, liver function tests (like total bilirubin and alkaline phosphate). General examinations (blood pressure, height, weight, CVS, RS). The data collected in the beginning and at the end of the study.

RESULTS:

Table I – Experimental group tests

Sub-jects	Age	Sex	Weight (Kg)		Globulin (2.3 – 3.5 g/dL)		Alkaline Phosphatase (60-170 U/L)	
			Pre	Post	Pre	Post	Pre	Post
1	23	M	61.1	60.	3.3	2.8	65	62
2	25	F	53.6	50.2	3.3	3.2	68	63
3	24	M	43.1	44	3.3	3.1	110	106
4	25	M	58.1	56.6	3.4	2.7	84	72
5	24	M	49.1	49.5	2.9	2.3	121	119
6	43	M	45.1	46.2	3.8	3.6	106	103
7	22	M	66.6	64.3	3.2	3	87	60
8	37	M	73.5	69.1	3.6	2.5	90	80
9	29	F	47.9	47.2	3.6	2.9	54	48
10	41	M	74.8	70.1	2.7	2.5	148	76

At level of significance $p = 0.05$

Foot note: Table 1 shows the observations in weight, globulin and alkaline phosphatase in the experimental group.

Table II – Control group tests

Sub-jects	Age	Sex	Weight (Kg)		Globulin (2.3 – 3.5 g/dL)		Alkaline Phosphatase (60-170 U/L)	
			Pre	Post	Pre	Post	Pre	Post
1	22	M	60.8	60.5	3.1	3.9	72	76
2	45	M	68.7	68	3.4	3.6	78	80
3	45	F	66.5	67	3.2	2.9	83	113
4	27	M	79.6	80.5	3.4	2.7	113	112
5	37	M	65	69	2.8	2.5	89	87
6	19	M	53.1	53	2.9	3	73	54

7	28	M	55	54	2.8	2.7	75	74
8	29	M	70.9	70.8	3.3	3	85	82
9	21	M	67.4	67	3.1	2.9	118	99
10	22	M	58	58	3.5	2.7	93	95

Foot note: Table 2 shows the observations in weight, globulin and alkaline phosphatase control group.

Statistical Analysis of Data:

Table III – Experimental group

Sl. No	Para-meters	Mean		S.D		‘t’ - value	P – value	Signi-ficance
		Pre	Post	Pre	Post			
1	Globulin	3.31	2.86	0.328	0.386	4.391	0.0008	H.S
2	Alkaline Phosphatase	93.3	79.3	28.523	23.716	2.030	0.036	S

H.S = highly significant, S = Significant

Foot note: Table 3 shows the observations in standard deviation and level os significance in experimental group.

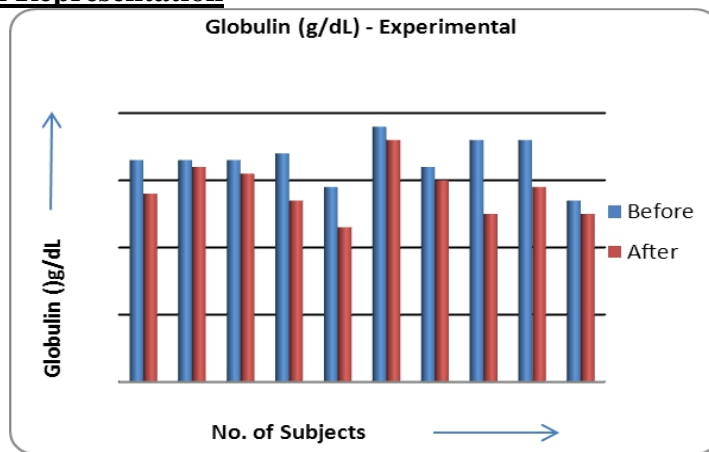
Table IV – Control group

Sl. No	Para-meters	Mean		S.D		‘t’ - value	P – value	Signi-ficance
		Pre	Post	Pre	Post			
1	Globulin	3.15	2.99	0.255	0.436	1.106	0.297	N.S
2	Alkaline Phosphatase	87.9	87.2	16.107	18.140	0.163	0.873	N.S

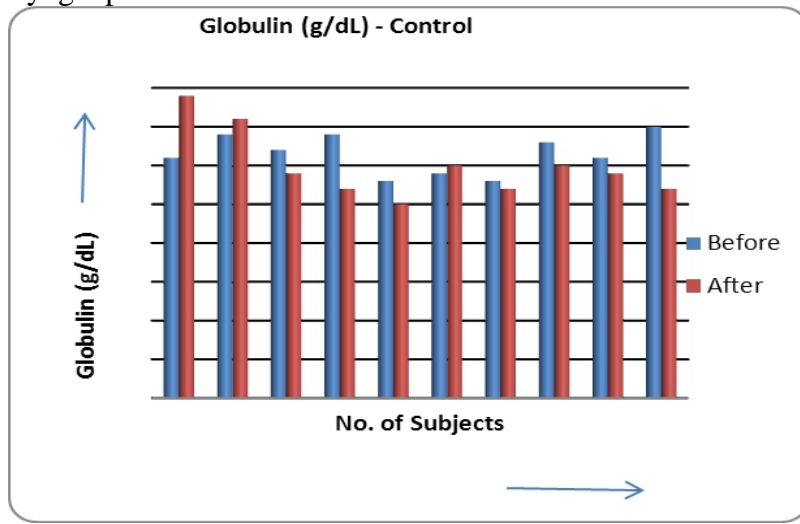
N.S = Non significant

Foot note: Table 4 shows the observations in standard deviation and level os significance in control group.

Graphical Representation



Foot note: graph 1 represents the variation of globulin before and after the yogic practice.



Foot note: graph 2 represents the variation of globulin before and after the yogic practice.

DISCUSSION

The liver purifies our blood and maintains the body process. Various Yogic practices help to increase the gastric fire. It is important to note that practices like Āsana, Prāṇāyāma with relaxation are effective to enhance the functioning of the body even in the healthy individuals without any side effects. In this small study, the globulin and alkaline phosphatase levels have been recorded. The mean value of globulin reduced from 3.31 g/dL to 2.86 g/dL with $p = 0.00087$, which is highly significant. Similarly, alkaline phosphatase were reduced from 93.3 U/I to 79.3 U/L, with $p = 0.0364$ in the experimental group. On the other hand, the mean value in control group was not significantly changed. Thus, the results show improvement in the liver functioning only in experimental group.

Conclusion

On the basis of discussion of results, it can be concluded that Yogic practices have substantially and significantly reduced the level of globulin, alkaline phosphatase in the experimental group whereas such changes were not seen in the control group. This implies that the various Yogic practices is the right solution to enhance the functioning of the liver of an individual. Yogic practices of longer duration will be more effective to improve liver functions.

References:

- Vivekānanda Svāmi, “*Rāja Yoga*”, Pātañjala Yoga Sūtra [I -30], Advaita Ashram publications, Kolkata, 36th edition, January 2009, Page No. 146.
- Vivekānanda Svāmi, “*Rāja Yoga*”, Pātañjala Yoga Sūtra [II -28], Advaita Ashram publications, Kolkata, 36th edition, January 2009, Page No. 204.
- Gheraṇḍa Saṁhitā*, edited by Digambarji Swami and Gharote M. L, Chapter (I-38), published by Kaivalyadhama S.M.Y.M. Samiti, Lonavala (India), Second edition, published in the year 1997, ISBN No. 81-90280333, page no. 18.
- Gheraṇḍa Saṁhitā*, edited by Digambarji Swami and Gharote M. L, Chapter (I-40), published by Kaivalyadhama S.M.Y.M. Samiti, Lonavala (India), Second edition, published in the year 1997, ISBN No. 81-90280333, Page no. 19.
- Luuk J,Rijzewijk, Rutger W. Van der Meer, and Michaela Diamant. *Liver Fat Content in Type 2 Diabetes: Relationship with Hepatic Perfusion and Substrate Metabolism*, published in [Pub Med] by American Diabetes Association in 2013 April; 59(11): 2747–2754.
- Sanjeev Rastogi and Ranjana Rastogi. *Ayurvedic Intervention in Metastatic Liver Disease*, published in The Journal of Alternative and Complementary Medicine. July 2012, 18(7): 719-722.
- Montserrat Marí, Anna Colell, Albert Morales, Claudia von Montfort, Carmen Garcia-Ruiz, José C. and Fernández-Checa (2010). *Redox Control of Liver Function in Health and Disease*, published in The Journal of Alternative and Complementary Medicine, Published in Volume: 12 Issue 11: April 28, 2010.
- Gore, M.M, *Anatomy and Physiology of Yogic Practices*, published by New Age Books, New Delhi, 4th revised edition, 2010, ISBN No. 978-81-7822-305-6, Page no.15.
- B.R. Thapa and Anij Walia (2007), *Liver Function Tests and their Interpretation*, Published in Indian Journal of Pediatrics, Volume 74—July, 2007, Page no. 64-73.
- Green R.M and Flamm S (2011), “*Abnormal Liver Chemistry - Evaluation and Interpretation*”, Published in GASTROENTEROLOGY (e-journal), 2002; 123:1367-1384.
- Limdi J.K and Hyde G.M (2013), *Evaluation of abnormal liver function tests*, Published by Postgrad Medical e journal - J 2003 79: 307-312.