Effects of Sudarshan Kriya on Alcohol Dependent Patients

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Abstract

Background: Sudarshana Kriya Yoga (SKY) is a procedure that involves essentially rhythmic hyperventilation at different rates of breathing. The antidepressant efficacy of SKY was demonstrated in melancholia with two of the current standard treatments, electroconvulsive therapy (ECT) and imipramine (IMN). This study is an attempt to evaluate the effect of Sudarshana Kriya yoga on alcohol dependent patients. Method: Consenting, detoxified alcoholics (N=60) were hospitalized and randomized equally into two treatment groups. Group I subjects underwent standard treatment procedure for three weeks, group II subjects underwent Sudarshana Kriya procedure for three weeks. Results: Significant reductions in the total scores on Beck Depression Inventory (BDI), Beck Anxiety Inventory (BAI) and blood parameters such as ACTH, Cortisol and Prolactin were shown at 21st day. However, significant changes were noticed in SKY group in all parameter at 21st day when compared to control group. No clinically significant side effects were observed. Discussion: The results indicate that reduction in stress following SKY practice in alcoholics.

Key words: Alcoholics; Sudarshan Kriya Yoga; S tress.

Introduction:

Alcohol is one of the most abused substances in the world. It is now generally recognized that alcoholism is one of the major social, economical and medical problems confronting our society. Alcohol use and the problems associated with it are on the increase in India. Studies on alcohol abuse among general population in India have indicated that 30% of the males and less than 5% of the females are alcohol users [1]. The social costs of material damage, criminal activities, of reducing external costs and distress to family and friends are considerable but difficult to monetise.

Many treatment approaches have been used to treat the alcoholism, such as Disulfiram Therapy (DT), Aversion Therapy and other non pharmacological therapies viz; individual and Clinical Oriental Therapy (COT), Alcohol Anonymous (AA), Psychotherapy, Counselling, Behaviour Therapy (BT), Cognitive Behaviour Therapy (CBT) and Relapse Prevention Therapy (RPT). While each of these treatment modalities have met with limited success in achieving abstinence, the pharmacological treatment appears to be more promising in the management of alcoholism; but the rate of relapse is in the region of 40-50% [2].

In this context, newer methods of approach have been considered to prevent relapse. Yoga an ancient Indian culture and way of life, which gives the practitioner a healthy body and sound mind is known to alleviate stress and produce relaxation. Yoga research group at NIMHANS adopted Sudarshana Kriya Yoga (SKY) for treating depression (Yoga research group 1995). Patients learn this with ease in less than 2-4 weeks and it has no known side effects.

Sudarshan Kriya (Su=right, Darshan=vision, Kriya=procedure) was devised by a spiritual guru, Sri Sri Ravi Shankar of the Art of Living Foundation, Bangalore, India. It has been practiced as a brief and practical self-help stress-management strategy. Impressionistic reports of the participants indicate that it reduces anxiety and depression. From the biomedical point of view, it is essentially hyperventilation with demonstrable effects on brain function [3]. These observations suggest that Sudarshan Kriya may have anti-depressant potential. However, to make it widely acceptable to patients and the medical profession, some of the adventitious components (e.g., briefing about positive attitudes to life, 'living in the present', etc.)" were dropped as were the meditative aspects. The procedure is devised as a physiological technique consisting of only specified rhythms of breathing. This adaptation for clinical purposes was designated Sudarshan Kriya Yoga (SKY).

In an open, three-month clinical trial, SKY, as the sole treatment in dysthymic patients (n=46), produced significant anti-depressant effects, with 25 (68%)of the 37 patients who completed the treatment in remission. Small but significant elevations of serum prolactin (but not of Cortisol) occurred following a session of SKY. Following improvement with SKY therapy, significant increments in P300 (ERP) amplitude ('normalization') occurred [4]. In an independent sample of major depressive disorder patients, SKY lengthened REM sleep latency and slow wave sleep [5]. These objective changes, associated with therapeutic effects and a response rate of 68%, further suggest that SKY produces more that a placebo anti-depressant effect [6]. In this study, we compared the therapeutic efficacy of SKY on psychological parameters such as Anxiety, Depression and on hormones, such as ACTH, Cortisol, and Prolactin.

Methodology:

SUBJECTS: The patients for this study were selected among those who are seeking treatment for alcoholism at the De-Addiction Unit, NIMHANS, Bangalore. Patients, who fulfilled the DSM-IV criteria for alcohol dependence, were selected. They were given a detailed understanding of the study and their consent was taken. Detailed assessment was made on

age, occupation, duration of alcohol dependence, approximate quantity of alcohol consumption per day and health status.

Evaluation such as specific exclusion and inclusion criteria listed below were part of the standard battery of admission assessments for all patients entering this program. Inclusion criteria were; 1) Sex: Males, 2) Age: Between 18 and 55 years, 3) Satisfying DSM-IV criteria for alcohol dependence syndrome, 4) Willing to undergo inpatient treatment. Exclusion criteria were; 1) Having any severe physical illness like Cardiac illness, Hypertension, Diabetes, Epilepsy, Respiratory disease, Neurological illness, Head injury or organic mental illness, 2) High suicidal risk, 3) Presence of dependence on any other drug of abuses other than tobacco, 4) History of Mania and schizophrenia, 5) Physically disabled person, 6) Presence of mental retardation.

Experimental design: The patients recruited for the stud*y* were allowed to detoxify for seven days. They were, then randomly allocated into two treatment groups of equal size.
1) Experimental group: Received the current standard treatment along with SKY therapy for 15 days. 2) Control group: Received only current standard treatment for 15 days without SKY.

Treatment Procedures*:*

Current Standard Treatment:

Treatment of alcoholism included detoxification, treatment of medical complications, nutritional supplementation, long-term management of alcohol dependence both pharmacological and psychosocial. Alcohol dependent patients were subjected to all the treatment methods to attain complete abstinence.

1) Detoxification: The aim of detoxification is the symptomatic management of the emergent withdrawal symptoms, i.e. symptoms produced by the removal of the alcohol. The usual duration of uncomplicated withdrawal symptoms is 6 days. Benzodiazepine was usually prescribed.

A benzodiazepine is prescribed for two reasons: first, to reduce the risk of severe withdrawal symptoms including Delirium or Convulsions; second, to assist the individual to abstain or reduce drinking and overcome longing for alcohol (craving). When managing severe withdrawal symptoms with marked agitation and tremor, or incipient delirium, diazepam (starting at 10mg four times daily) was preferred because it has a more rapid action and can be given parenterally. Oxazepam or Lorazepam is preferred if liver function was severely impaired. Diazepam (10mg) may be given every hour until symptoms are controlled (symptom-triggered dosing). This procedure helps the patient to recover faster. Thiamine stores would be depleted and hence supplements are usually given during detoxification.

2) Long Trem Treatment Approaches: After the detoxification, there are several methods to choose from for further management. The important methods are,

a) Marital and family therapy. The family of someone with a drinking problem might have been suffering for years and could benefit from advice and understanding. The wife and other members of the family are taught to provide positive reinforcement (such as verbal acknowledgement, going to movie, market together, making special dinner and snacks) if the patient was not drinking. The wife is advised to initiate pleasing and caring behavior on a daily basis. Planning and engaging in Shared Rewarding Activities (SRAs) could be initiated by simply having each spouse make a separate list of possible activities. Each activity would involve both spouses, either by themselves, with their children, or with other adults, and could be at home or away from home. Finally, the therapist instructs the couple to refrain from discussing problems or conflicts during their planned SRAs.

b) Social Skill Training: Improving coping skills is an important part of initial addiction treatment to reduce the risk of relapse. Coping skill refers to the ability to use thought, emotion and action effectively to solve intrapersonal and interpersonal problems and to achieve personal goals. A cognitive social learning model could be used to analyze relapse determinants and formulate appropriate skills training techniques. Within this model, skillful behavior is an interaction of the individual's cognition, affect and behavior with the environment and particularly with other individuals. Also important is the extent to which emotions such anxiety or depression interferes with coping.

c) Prevention of Relapse : Patients are helped to identify seemingly irrelevant decisions in which a sequence that ended in drinking began with apparently unconnected actions. In this therapy, Patients are educated about 1) the abstinence violation effect 2) understand relapse as a process 3) cope with craving and urges to engage in the addictive behavior, 4) reduce the harm of relapse by minimizing the negative consequences and learning from the experience, 5) achieve a balanced life style. However, Patients are advised to take anti-craving and deterrent agents.

Disulfiram (250mg) is usually prescribed everyday for six months after 21 days of detoxification with the consent. Before prescribing, a physical examination and baseline liver tests are conducted. A family member is involved in this treatment. The individual could lead his normal life without alcohol.

SKY Procedure: The SKY procedure was a standardized technique of about 1-hour duration. It was practiced within the hall with good ventilation, free from dust. It was practiced usually in sitting posture (sukasana) with eyes closed on clean carpet. SKY was practiced before breakfast. It was advised to give a gap of 3 hours if patient had the lunch, 1 hour after breakfast. The SKY procedure consisted of three sequential breathing components, interspersed with normal respiration, as described below.

1) **Ujjayi Pranayama**: Consists of slow deep breathing using throat. Each cycle includes breathing in, holding, breathing out and holding. There are three different stages of Ujjayi pranayama viz. 1. Diaphragmatic breathing 2. Thoracic breathing: 3. Clavicular breathing.

2) **Bhastrika pranayama** consists of forced inhalation & exhalation 20 times, practiced for three such rounds with one-minute relaxation in between.

The total duration of ujjayi & bhastrika pranayama will be about 12-15 minutes.

3) Cyclical breathing consists of slow cycles, medium cycles, and fast cycles of breathing practiced for a total duration of 30

minutes.

4) At the end of these components, the patients were asked to remain in yoga nidra (tranquil state) for about 20 minutes. The entire procedure lasted about 65-70minites.

Patients were asked to practice the SKY procedure every day for about 60 minutes for 15 days.

Assessment:

A psychiatrist, who was uninvolved in treatment assignments, did the assessments. The patients admitted for the study were assessed in detail. The socio-demographic profile and clinical characteristics were recorded in a structured proforma. The baseline investigations and thorough physical examinations were carried out to rule out any physical illness. Severity of alcohol dependence syndrome was assessed by using Severity of alcohol dependence questionnaire (SADQ). After the detoxification, the patients were allocated to the two groups of equal size, according to the random number table. The severity of depression and anxiety were assessed using the Beck Depression Inventory and Beck Anxiety Inventory initially at 7th day (before the SKY treatment) and at 21st day (after SKY the treatment).

Similarly, hormones such as ACTH, Cortisol, and Prolactin tests were measured on two occasions, on day 7 (plasma) and on day 21 for both the groups. The tests were carried out at clinical biochemistry unit, Department of Neurochemistry, NIMHANS without knowledge of clinical details.

Sample Collection and Test Procedure:

10ml venous blood was collected in disposable heparinized syringe, and 1ml of blood was taken for cytogenetic test and remaining blood was centrifuged immediately (within 30 minutes) to separate plasma. The separated plasma was stored at –70 degree centigrade for hormonal assay.

Prolactin assay was done using IMx system (ABBOTT DIAGNOSTICS). This IMx system is a fully automated immuno assay analyzer using micro particle enzyme technology. Cortisol assay was carried out using TDX system (Abbott diagnostics). The TDX system uses Fluorescence Polarization Immuno Assay (FPIA) technology. ACTH levels were measured using Radio Immuno Assay (RIA) kits.

_Statistical Analysis: The categorical variables such as age, marital status, education, occupation, habitat, amount of money spent, duration of drinking, SADQ were analyzed using chi-square test. The pre-treatment values of depression, anxiety, Prolactin, Cortisol and ACTH are compared with the post-treatment values at day 7 and day 21 in both groups using *paired samples statistical test*. The post treatment values at day 21 of the both groups were compared, taking pretreatment values as covariates to find out the SKY treatment effect on alcoholic by using *TWO WAY ANOVA*.

Results:

The total number of sample consisted of eighty patients. Out of 80 patients selected (40 patients from each groups) for the study, 20 patients could not complete the study (10 from each group) and remaining 60 patients (30 from each group) completed the treatment procedure. The mean age was 36.68(±7.65) years. Of the 60 patients completed the study, 48 were married and living with family and 12 were not married. 46 patients were working and 14 were not. The mean amount of money spent for drinking per month was Rs 2533 ((±683.5) in controls and Rs 2617((±654.5) in SKY groups. The mean duration of drinking was 10.6 (±5.6) years in controls and 11.4 (±6.7) years in SKY groups.

In the table-1, the data of individual social demographic and illness characteristic comparison of both groups are given for age, marital status, education, occupation, habitat, amount of money spent for drinking per month. There was no statistically significant difference found in any of the variable between the groups. The severity of alcohol drinking was assessed using SADQ questionnaire before the treatment. The mean SADQ scores were 33.20 (±5.54) and 31.73 (±6.73) in controls and SKY groups respectively at the time of admission. There was no statistically significant difference found between groups (as shown in table-1).

Table-1: Social-Demographic and Illness Characterstic Comparison Between Control vs. SKY Practitioners

Variables	Control Group (N=30)	SKY Group (N=30)
Age in years Mean (SD)	**35.60(±8.07)**	**37.77(±7.34)**
Marital Status M - Married; U - Unmarried	**M-25; U-5**	**M-23; U-7**
Education years Mean (SD)	**11.43(±2.60)**	**10.47(±3.01)**
Work Status W - Working; U - Not working	**W-25; U-5**	**W-21; U-9**
Habitat R - Rural; U - Urban	**R-14; U-16**	**R-12; U-18**
Money spent/month (In Rupees) Mean(SD)	**2533.33(±683.46)**	**2616.67(±654.47)**
Duration of Drinking (Number of Years) Mean(SD)	**10.83(±5.65)**	**11.43(±6.75)**
SADQ Score Mean(SD)	**33.20(±5.54)**	**31.73(±6.29)**

Table-1, Indicates the data of individual social demographic and illness characteristic, comparison between Controls vs. SKY groups in age, marital status, education, occupation, habitat, amount of money spent for drinking per month, duration of drinking, SADQ scores (N=30). There was no statistically significant difference found in any of the variable between the groups.

Among the 60 patients (30 from each group) completed the study; there is a significant improvement in depression, anxiety levels. Significant reduction in BDI and BAI scores were observed in both groups at post treatment score

Table-2.

Variables	Pre-treatment scores, at day 7 (N=30) Mean (±SD)	*t value*	*P value*	Post-treatment Scores, at day 21 (N=30) Mean (±SD)
BDI scores Controls	**39.8(±5.4)**	*27.3*	*0.000*	**16.4(±4.2)**
BDI scores SKY	**39.7(±5.7)**	*30.1*	*0.000*	**9.6(±3.7)**

Analysis of co-variance However post treatment BDI scores were significantly lower in the SKY group (F=54.3; df= I,57;

p<0.001).

B) **Severity of anxiety:**

It was measured using BAI questionnaire. BAI score reduced at day 21 significantly in both groups.

Table-3

Variables	Pre-treatment session, at day 7 (N=30) Mean (±SD)	Post-treatment Session, at day 21 (N=30) Mean (±SD)	
		t value	*P value*
BAI Controls	**34.9(±6.8)**	**15.7(±4.1)**	
		14.9	*0.000*
BDI scores SKY	**36.8(±7.4)**	**10.2(±3.0)**	
		20.5	*0.000*

Analysis of co-variance

We compared the post treatment values of control and SKY groups taking BAI pre-treatment values as covariates. The SKY group had significantly lower scores at day 21 (F=39.5; df=1,57; p<0.001).

Biochemical Parameters

The hormone levels of Prolactin, ACTH, and Cortisol were compared between the two groups before and after the treatment. The post treatment values of both groups were compared with pre treatment values as covariates to demonstrate SKY effects on alcoholics. Significant changes were observed in hormones levels.

Prolactin Levels

There is significant increase in plasma Prolactin levels at post treatment values of both groups when compared to pre-treatment values

Table-4.

Variables	Pre-treatment session, at day 7 (N=30) Mean (±SD)	Post-treatment Session, at day 21 (N=30) Mean (±SD)	
		t value	*P value*
Prolactin Controls	**6.8(±1.7)**	**9.0(±2.2)**	
		-5.8	*0.000*
Prolactin SKY	**5.6(±2.4)**	**12.1(±3.4)**	
		10.6	*0.000*

Analysis of co-variance

Comparing the post treatment values of control and SKY groups taking Prolactin pre-treatment values as covariates, The SKY group showed statistically significant elevated level (F=12.2; df= 1,57; p<0.001).

ACTH Levels

There was significant reduction in plasma ACTH levels at post treatment values of both groups when compared to pre-treatment values.

Table-5.

Variables	Pre-treatment session, at day 7 (N=30) Mean (±SD)	Post-treatment Session, at day 21 (N=30) Mean (±SD)	
		t value	*P value*
ACTH Controls	**285.57(±39.24)**	**245.63(±42.24)**	
		8.0412	*0.000*
ACTH SKY	**286.43(±48.71)**	**171.53(±42.91)**	
		12.05	*0.000*

Analysis of co-variance

Comparing the post treatment values of control and SKY groups by taking ACTH pre-treatment values as covariate. The SKY group showed statistically significant reduction (F=39.7; df=1,57; P<0.001)

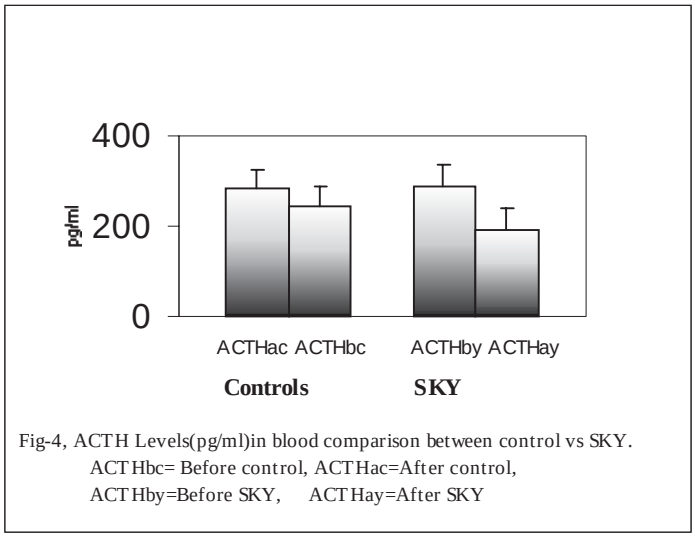

Fig-4, ACTH Levels(pg/ml)in blood comparison between control vs SKY. ACTHbc= Before control, ACTHac=After control, ACTHby=Before SKY, ACTHay=After SKY

Cortisol Levels

There is a significant decrease in post treatment value when compared to pre-treatment values of both groups.

Table-6.

Variables	Pre-treatment session, at day 7 (N=30) Mean (±SD)	Post-treatment Session, at day 21 (N=30) Mean (±SD)	
		t value	*P value*
Cortisol Controls	**8.8(±3.5)**	**6.2(±2.1)**	
		3.94	*0.000*
Cortisol SKY	**8.2(±3.1)**	**3.5(±1.6)**	
		8.81	*0.000*

Analysis of co-variance

Comparing the post treatment values of control and SKY groups by taking cortisol pre-treatment values as covariates, The SKY group showed statistically significant lower cortisol levels (F=3.5; df=29.3;df=1,57, p<0.001).

Discussion:

Yoga is a living science that has evolved over thousands of years and continues to evolve in accordance with the needs of humanity. India is a large reservoir of traditional knowledge,

which is not adequately applied due to the lack of awareness in the country. Long before the discovery of psychoanalysis by the West, Indian thinkers had understood the complexity of mind, the interplay of cognition, behaviour and emotion. Based upon this wisdom they applied various psychotherapeutic techniques akin to our modern cognitive and behaviour therapies.

Living with relaxed mind and body is our natural state. It is only the pace of our lives that has made us forget the relaxed state of mind. As we know, the state of our mind and the state of our bodies are intimately linked. If your muscles are relaxed, then your mind must be relaxed. If the mind is anxious, then the body suffers too [7]. All action originates in the mind. Yoga practice will help to be in touch with your body and mind, able to recognize tension and relaxation and thus to bring them under conscious control.

Yoga is also a systematic procedure through which one can experience the union of individual consciousness with the universal one. The practice of yoga leads to direct experimental knowledge of an absolute consciousness [8]. In recent years, there has been an increasing awareness and appreciation of the utility of yoga not only in India but also worldwide. Yoga is found to be beneficial for the promotion, maintenance of health in certain psychosomatic disorders.

Pranayama forms the fourth limb of Patanjali's eight-limb Asthanga Yoga. Pranayama as defined in yoga sutras of Patanjali is the science of cleaning, balancing and gaining control over the prana in the human system. It is the science of harnessing the breath for gaining control over the prana and thereby, on the mind.

Sudarshana Kriya Yoga (SKY) is an advanced version of rhythmic breathing, developed by Sri Sri Ravishankar, Founder, International Art of Living Foundation. It is also known as Healing breath, and is taught as part of the Art of Living course spread over 24 hours. He points out that there are rhythms natural to all life processes. Yet because of the unnatural stresses of modern life the rhythms of body, breath, emotions, and environment rarely are synchronous. This makes us more vulnerable to disease. Perfect balance of this breath makes perfect health possible. One can choose to be in good health. SKY provides a unique system of mind, body and soul integration, using the healing breath.

One of the most common causes of relapse into heavy drinking is the experience of negative emotion often those caused by interpersonal stress. With different anxiety management strategies such as Psychotherapy, Family Therapy, Group Therapy, Behavioural Therapy, Cognitive Therapy, however, the relapse rate is still more than 50% [2].

There is no systematic research conducted so far to document these therapeutic effects of SKY on alcohol dependence patients. Earlier studies on the SKY involved normal subjects or those suffering from depression. Some alcoholics who were practicing SKY had mentioned their success in achieving abstinence. The result of this study showed that depression and anxiety levels fell significantly lower after SKY practice of two weeks [9].

This is in accordance with other reports. Recent studies showed that practicing asana, pranayama and meditation reduced anxiety and depression significantly in young fellowship trainees [10]. Similar observation was reported that anxiety levels were reduced significantly in alcoholics who were practicing Transcendental meditation [11,12]. The mood enhancing effects of SKY results in alleviation of both anxiety and depressive symptoms of alcoholics. It is well known that in major depressive disorder and chronic anxiety increase risk for alcoholism. In the clinical studies, it was reported that 40-70% of patients suffer from alcohol-induced anxiety. In our study we have observed significant reduction in BAI score in SKY group as compared to the control group in the end of treatment. Similar effect was observed following 3 weeks of SKY treatment in major depressive disorder [13]. However, there was no such study using SKY a treatment strategy on alcoholics.

The present study also showed that plasma ACTH levels decreased at post treatment session in control as well as SKY groups. However, in the comparison between the two groups at post treatment session, the SKY group showed significant decrease in the ACTH levels. Plasma ACTH levels were found to be raised in chronic alcoholics. There was positive and statistically significant correlation between depression rating scale and plasma ACTH. Usually in chronic alcoholism the negative feedback mechanism seems to be disturbed between plasma ACTH and Cortisol levels, which are not normalized after one week of total abstinence. Chronic ethanol ingestion might have a direct stimulatory effect on the adrenal cortex leading to deregulation of the HPA axis [14].

SKY already has proven significant anti depressant effect [6]. There seems to be a delayed lowering of cortisol on continued practice of SKY as evidenced by lower cortisol level at day 21 compared to those at day 3 in depressive disorder [15]. It is also observed that cortisol concentration fall significantly after practice of 20 minutes of Transcendental meditation [16].

The present study has pointed to the reduction in ACTH and cortisol significantly in SKY group, and led to conclude that SKY has an effect on HPA axis. Reduction in cortisol influence carbohydrate, lipid, protein, and nucleic acid metabolism; the cardiovascular system; bone and calcium metabolism [17]; the central nervous system; and growth, development, and reproduction, which helps to improve overall physical condition of alcoholic patients.

In the present study, SKY produced significant increase in prolactin secretion when compared to control group at day 21. Recent studies on SKY showed that it produces significant increase in prolactin secretion across one session in depressive disorders. The increase is almost two folds. This is similar to the response to Electro Convulsive Therapy (ECT) induced seizures, though the prolactin levels were much higher with the latter [15]. From these studies it can be assumed that SKY could have direct effect on dopamine synthesis. It is in turn regulated by hypothalamus. It is from this understanding; we can conclude that SKY had an effect on the brain.

Finally, we can summarize entire study that Sudarshana kriya yoga was having an anti depressant and anxiolytic effect on alcoholics, which were mainly responsible for relapse. These results were supported by studying hormonal analysis such as ACTH, cortisol, and prolactin parameters, used as biological marker. However, there is no study on the relapse

prevention. From this study we can conclude that it has an effect on psychological and physiological parameters. It can be used to treat withdrawal symptoms and to reduce the psychological as well as physical stresses of alcoholic patients during detoxification since it does not have any side effect, easy to practice, no money involved and can also be recommended to practice everyday to live healthy, happy life.

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Healing Experiences

Before coming here at Rishikesh, I got checked my spectacle number. Doctor said that in both eyes number have reduced by 0.25. When I heard Dr Vinod here at Rishikesh about benefits of Kriya including eye numbers I realized the reason. I am doing Kriya for last one year.

Jai Gurudev.

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