



Biological Effects of Sudarshana Kriya on Alcoholics

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Abstract:

Introduction: Sudarshana Kriya Yoga (SKY) has demonstrable antidepressant anxiolytic effects.

Methods: SKY was tested for this effect in inpatients of alcohol dependence who completed acute detoxification. Consenting patients (n=60) were equally randomized to receive SKY therapy or not (controls) for two weeks following the acute detoxification management. They completed the BDI before and after the two weeks of intervention. Morning plasma cortisol, ACTH and prolactin too were measured before and at the end of two weeks. Results: Significant reductions in BDI scores occurred; being more so in SKY group. Plasma cortisol as well as ACTH fell after two weeks being more so in SKY group. Reduction in BDI scores correlated with that in cortisol in SKY group but not in controls. Results extend the antidepressant effects of SKY in alcohol dependence patients. Reduction in stress-hormone levels (cortisol and ACTH) along with BDI reductions support a biological mechanism of SKY in producing beneficial effects. P300 has shown significant changes. Conclusion: SKY may hold promise as an alternative to antidepressant drug therapy.

Key words: Sudarshana Kriya Yoga (SKY), Alcohol, and Hormones, P300.

Introduction

Treatments aiming at reducing craving or achieving abstinence in alcohol dependent patients have met with varied, yet limited success. Relapse rates are close to 50% (Benegal et al 2000). Depression is the commonest comorbid condition in these patients (Setter et al 1991, Hasin et al 2000). Even during acute withdrawal and detoxification mood symptoms manifest.



Such mood symptoms may well persist even after the acute phase of withdrawal potentially making way for relapse (Trevisan LA, et.al 1). Accordingly, there is evidence for successful use of an antidepressant in detoxification phase itself (Deborah S, et al 2002). In our earlier studies we demonstrated that Sudarshana Kriya Yoga (SKY) a breathing therapy developed by the Spiritual Guru Sri Sri Ravishankar of the Art-of-Living Foundation had significant antidepressant effects (NJR 1 & 2).

Hormonal changes occur with clinical affective states. Depression is associated with stress and as a result elevated levels of cortisol and ACTH (ref x & y). Stress associated with alcohol withdrawal and/or the coexisting depression is known to activate brain CRF systems (z). SKY also produced prolactin elevation acutely (NJR 1, Sudarshan thesis) and after two weeks of practice lowered serum cortisol responses to SKY. The latter effect may reflect antidepressant as well as anti-stress effects of SKY. We tested therefore, the use of SKY therapy during acute detoxification period in reducing mood symptoms and altering hormone levels in patients with alcohol dependence.

Methods

Patients: Sixty consecutive inpatients (age 18-55) with alcohol dependence syndrome (DSM-IV) formed the sample. All patients were admitted for the first time in the deaddiction center of NIMHANS for detoxification and signed an informed consent statement. Patients, having severe physical illness like cardiac illness, hypertension, uncontrolled diabetes, epilepsy, respiratory disease, neurological illness, head injury or organic mental illness, high suicidal risk, dependence on any drug other than tobacco and alcohol were excluded from the study. So also were patients with history of mania and schizophrenia and mental retardation. Each subject underwent a detailed medical and psychiatric assessment by a team of qualified psychiatrists.

Detoxification: Standard detoxification program was initiated from the day of admission. At the end of one week (day-7) in addition to continued detox therapy, patients were randomly assigned to two groups for next two weeks: (a) SKY therapy (b) continued detox therapy alone; to be referred to as SKY and Control groups respectively. Both groups received in this period B-Complex capsules and variable but tapered doses of chlordiazepoxide as prescribed by the treating physician uninvolved in this study. Before the intervention, the two groups were comparable on the parameters given in Table-1. Patients in the control group had the option of receiving adjunct SKY therapy as inpatient or outpatient after the two weeks of this intervention (day-21).

SKY Therapy: The Sudarshana Kriya Yoga (SKY) (Su = proper, Darshana = vision, Kriya = Purifying action) is based on ancient Vedic tradition. SKY involved a standardized procedure of about 1-hour in sitting posture (*Sukhasana*) with eyes closed on clean carpet. SKY sessions



were held in the morning's atleast one hour after breakfast. The SKY procedure consisted of three distinctive breathing periods (Pranayama): 1. *Ujjayi Pranayama*: Consists of slow deep breathing using throat. Each cycle includes breathing in, holding, breathing out and holding. 2. *Bhastrika pranayama* consists of forced inhalation & exhalation 20 times. The total duration of *Ujjayi & Bhastrika pranayama* will be about 12-15 minutes. 3) *Cyclical breathing* consists of slow cycles, medium cycles, and fast breathing practiced for a total duration of 30 minutes. At the end of these components, the patients were asked to remain in *Yoga Nidra* (lying in a tranquil state) for about 20 minutes.

Sample collection & test procedure: Ten ml venous blood was collected in heparinized syringe at 9 AM on day-7 (pre) and day-21 (post). The (fasting) samples were collected before the treatment session on both days. The sample was immediately centrifuged to separate plasma. The separated plasma were coded and stored at -70 degree C for hormonal assay. Prolactin assays were done using IMx system and Cortisol assay was carried out using TDX system using commercially available kits. ACTH levels were measured using Radio Immuno Assay (RIA) kits. Patients completed the Beck's Depression Inventory (BDI) at the end of first week after admission (pre) and two weeks later (post) (completion of SKY or control course). P300 tests were conducted day-7 and day-21.

Statistical Analysis: The socio-demographic profile and clinical characteristics were analyzed using univariate statistical methods. The pre-treatment values at day-7 (pre) were compared in both groups using independent samples 't' test. The post treatment values and the change over two assessments at day 21 (post) of the both groups were compared using Repeated Measures ANOVA. At day-7 SKY and control groups did not differ on BDI scores or on the any hormone levels (Table). Percentage change between - pre and post - in BDI scores as well as similar change in ACTH and Cortisol levels were computed. These were subjected to angular transformation and Pearson's correlation was computed between the BDI score and the hormone levels. The value of statistical significance level was fixed at $p < 0.05$.

BDI scores significantly dropped at post-assessment and the drop was more in the SKY group. Drop also occurred in the plasma cortisol as well as ACTH levels differentially; being more in SKY group. Cortisol values dropped in all SKY patients and in only 22 of the controls ($X^2=9.2$, $df=1$; $p=0.005$). In the total patient sample the percent drop in BDI correlated positively with that of ACTH ($r=0.53$, $p < 0.001$) an also cortisol ($r=0.52$, $p < 0.001$). Percentage drop in ACTH and cortisol too were correlated ($r=0.35$, $p=0.14$). When examined separately only the correlation between percentage drop in BDI and that in cortisol for the SKY group was significant ($r=0.52$, $p=0.003$). Prolactin values increased significantly in the total sample with SKY patients having higher increase. These results are presented in the Table.1. No patient developed seizure either in SKY or control group in the two-week treatment period. P300 has shown significant change in SKY group.



Results :

Table-1: Social-demographic and illness characteristic: Comparison between SKY & Control

Group Variable	SKY (n=30)	Control (n=30)	Significance
Age (yrs)	35.60 (8.07)	37.77 (7.34)	't'=0.99; p>0.05
Married*	25	23	$\chi^2 = 0.30$; p>0.05
Employed*	25	21	$\chi^2 = 1.99$; p>0.05
Urban:Rural*	16:14	18:12	$\chi^2 = 0.47$; p>0.05
Alcohol expense Rs/month	2533 (683)	2617 (654)	't'=0.47; p>0.05
Drinking duration (yrs)	10.83 (5.65)	11.43 (6.75)	't'=0.34; p>0.05
SADQ score	33.20 (5.54)	31.73 (6.29)	't'=0.98; p>0.05
BDI-Pre BDI-post	39.7(5.8) 9.6(3.7)	39.8(5.4) 16.4 (4.2)	$F_1 = 10.28$, p<0.001; $F_2 = 1654.33$, p<0.001; $F_3 = 25.4$, P>0.001
Cortisol-Pre Cortisol-Post	8.3 (3.1) 3.6 (1.8)	8.5 (3.4) 6.4 (3.0)	$F_1 = 6.89$, p<0.001; $F_2 = 47.6$, p<0.001; $F_3 = 7.24$, p<0.001
ACTH-Pre ACTH-Post	284.0 (59.1) 191.5 (47.9)	277.9 (34.8) 242.4 (38.9)	$F_1 = 4.64$, p<0.001; $F_2 = 120.8$, p<0.001; $F_3 = 23.9$, p<0.001
Prolactin-Pre Prolactin-Post	5.7 (2.4) 12.2 (3.3)	6.8 (1.7) 9.1 (2.3)	$F_1 = 3.13$, p>0.05; $F_2 = 143.67$, p<0.001; $F_3 = 34.2$, p<0.001
Latency-pre Latency-post	361.29 (24.42) 319.35(22.20)	369.67(34.17) 347.56(35.56)	$F_1 = 5.50$, p>0.00, $F_2 = 9.26$ p>0.00, $F_3 = 14.73$, p>.0.001

Cortisol ($\mu\text{g/dl}$), ACTH (pg/ml) and Prolactin (ng/ml)

Cell contents refer to Mean (SD) except *numbers

F1-Group effect, df=1,58; F2 - Occasion effect, df=1,58; and F3 - Interaction, df=1,58

Discussion:

Sudarshana Kriya Yoga (SKY) is an advanced version of rhythmic breathing, developed by Sri Sri Ravishankar, Founder, International Art of Living Foundation (Sri Sri Ravishankar, 1995). SKY provides a unique system of mind, body and soul integration, using the healing breath.

In this study effect of SKY in reducing the depressive symptoms in alcohol dependent subjects in early abstinence was tested. SKY significantly lowered depression scores. SKY also reduced ACTH and cortisol levels in plasma. Magnitude of reduction in depression scores in the SKY group correlated with the reduction in plasma cortisol.



Findings of the study once again confirm the antidepressant effect of SKY (NJR1 & 2 and Rohini). In this randomised controlled trial SKY proved to have antidepressant effects in alcohol dependent subjects undergoing detoxification. Adding SKY in the early period of detoxification management was not associated with additional risk of seizures. Lippas et al (2005) suggest the advantages of adding an antidepressant in this period to reduce depressive symptoms. The present study suggests that SKY can be a potential yet safe alternative as an antidepressant therapy.

In our earlier studies we found elevations in prolactin, but not cortisol, acutely following SKY session but not a sham-SKY session (NJR 1). In this study we measured resting values of these hormones before starting SKY and two weeks after the daily-treatment sessions. Accordingly, the hormone changes observed cannot be compared across studies. Prolactin levels although changed did not figure as significant between groups. Had the blood been sampled shortly after the last session the prolactin elevation effects following SKY could have been demonstrated. On the other hand, ACTH and cortisol levels were reduced after the two weeks of intervention in SKY group. Acute 'stress' of physical exercise is associated with elevation in cortisol at 90 minutes post-exercise (Kiive et al 2004). Therefore, the cortisol and ACTH changes noted in this study cannot be attributed to acute 'stress' of the SKY that persisted. Instead, it can be argued that SKY has lowered the stress and hence ACTH & cortisol levels thereof. The change in the two hormone levels was correlated and hence this may suggest a common mechanism. Reduction BDI scores too correlated with the reduction in these hormone levels. This was significant for the SKY group and not so for the control. This further supports a more specific anti-stress effect of SKY that brought down depression scores as well as the two hormone levels. Changes in hormone levels provide a more objective evidence of beneficial effects of SKY. It remains to be seen if SKY therapy in the early detoxification stage confers extended benefit in maintaining abstinence/control over alcohol consumption for longer periods. There is indirect support from earlier studies that continued SKY practice extends antidepressant effects. It is likely that continued SKY practice, by its antidepressant effects, extends abstinence in patients with alcohol dependence too. Normalisation of P300 wave shown earlier results after 3weeks in depressive patients(Murthy 1997). It shows that SKY has significant impact on the brain and nervous system.

In summary, in this randomised controlled trial, SKY demonstrated significant antidepressant effects when offered to alcohol dependent subjects early in the course of detoxification. SKY also lowered plasma levels of ACTH and cortisol. The antidepressant effects correlated with lowering of serum cortisol. Potential role for SKY therapy in facilitating extended control over alcohol consumption is a promising area for research.



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