

PHOTO REPORT ON FOUNDATION COURSE IN YOGA



MONITORING COMMITTEE MEETING

Meeting of the monitoring committee of ACYTER was held in the office of the director, JIPMER on 22 July 2010 at 5 PM. The meeting was chaired by Dr. KSVK Subba Rao, Director, JIPMER and attended by :

- Dr. AK Das, Medical Superintendent, JIPMER – Member
- Dr. J Balachander, Professor & Head, Department of Cardiology, JIPMER- Member
- Dr. Satish RR Gaikwad, Research Officer (Scientific) & Incharge of Scientific Research Wing, MDNIY – Member
- Dr. Ananda Balayogi Bhavanani, Programme Co-ordinator ACYTER, JIPMER – Member
- Dr. Madanmohan - Professor & Head, Department of Physiology & Programme Director ACYTER - Member-Secretary



The meeting started with an introduction by the member secretary. The chairman suggested that minutes of the previous monitoring committee meetings be circulated to all members. The annual report of work done was discussed and it was suggested that a chronological pattern be followed and a new report be circulated to all members. It was decided to hold the national workshop on yoga and diabetes mellitus in February 2011 taking into consideration numerous conferences being held in March. The date is to be finalized in consultation and entered in the register maintained for the purpose by the Dean's office. Audited accounts for the years 2008-09 and 2009-10 were discussed and approved. It was suggested by the chairman to have a single sheet statement of accounts maintained from the inception of ACYTER. Proposed budget for the year 2010-11 was discussed and approved. Research activities at ACYTER were discussed.

The member secretary explained the present situation with regards to the two major proposals and the 7 pilot studies that have been completed till date. Dr Satish Gaikwad, Scientific officer, MDNIY, put forth the view of the director MDNIY regarding importance of research activities at ACYTER. He also gave an overview of the activities at the other Advanced Centres in NIMHANS, DIPAS and Gujarat Ayurved University.

Lack of adequate space for yoga practice sessions at ACYTER was discussed and the programme director was advised to write officially to get permission sanctioned for the use of Banting hall. The meeting ended with a vote of thanks by the member secretary.

After the meeting, Dr Satish Gaikwad, Research Officer (Scientific) & Incharge of Scientific Research Wing, MDNIY inspected the facilities and work done at ACYTER.



REPORT ON PILOT STUDIES AT ACYTER

Various pilot studies have been done by ACYTER staff under the direction of Dr Madanmohan, Programme Director ACYTER. The following studies have been conducted by Shri Jayasettiaseelon SRF, Dr Zeena Sanjay SRF, Shri G Dayanidy, Yoga Instructor and Selvi Vithiyalakshmi Yoga Instructor and coordinated by Dr Ananda Balayogi Bhavanani, Programme Co-ordinator.

1. IMMEDIATE EFFECT OF SUKHA PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF PATIENTS WITH HYPERTENSION

Introduction: Hypertension is one of the most common health disorders and yoga has been shown to be an effective adjunct therapy in its management. Earlier two studies from our laboratories have demonstrated heart rate (HR) and blood pressure (BP) lowering effects of slow, deep breathing after 3 weeks and 3 months of training. Beneficial effects of deep breathing in reducing premature ventricular complexes have also been reported by us. With this background, the present study was undertaken to determine the immediate effects of *sukha pranayama* on cardiovascular parameters in hypertensive patients.

Methods: 23 hypertensive patients attending the Yoga OPD at JIPMER were instructed to perform *sukha pranayama* for five minutes at the rate of 6 breaths / minute. *Sukha pranayama* is a slow and deep pattern of breathing where inhalation and exhalation are of equal duration. HR and BP were recorded before and immediately after the intervention. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: *Sukha pranayama* produced a significant ($p < 0.05$) reduction in HR from 79.5 ± 3.09 to 78 ± 3.24 beats/min and a highly significant ($p < 0.001$) reduction in systolic pressure from 132.5 ± 5.45 to 123 ± 3.83 mmHg. Pulse pressure decreased from 61.5 ± 3.39 to 52.5 ± 2.21 mm Hg, mean arterial pressure from 91.5 ± 3.19 to 88 ± 2.35 mm Hg, RPP from 107.28 ± 8.43 to 97.37 ± 6.97 units and Do P from 73.88 ± 53.72 to 69.52 ± 46.94 units, all these changes being statistically significant ($P < 0.001$).

Discussion and conclusion: It is concluded that *sukha pranayama* breathing at the rate of 6 breaths / minute can reduce HR and BP in hypertensive patients within five minutes of the practice. This may be due to normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation and /or decreased sympathetic activity. Further studies are required to understand the possible mechanisms underlying this beneficial effect in hypertensive patients.

2. IMMEDIATE CARDIOVASCULAR EFFECTS OF KAYA KRIYA IN NORMAL HEALTHY VOLUNTEERS

Introduction: *Kaya kriya* is a dynamic *hatha yoga* relaxation practice. It may have psycho-somatic harmonizing potential as it combines movement of different parts of the body with deep breathing in the supine position. The present study was undertaken to determine immediate effects of *kaya kriya* on cardiovascular parameters in normal subjects.

Methods: 12 normal subjects were instructed to perform *kaya kriya* for 10 minutes. Heart rate (HR) and blood pressure (BP) were measured with non-invasive semi-automatic BP monitor before and immediately after the practice. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: There was significant ($p < 0.01$) reduction in systolic pressure from 112.25 ± 2.91 to 108.83 ± 2.69 mmHg, diastolic pressure from 71.25 ± 1.72 to 68.17 ± 1.29 mmHg and

mean pressure from 84.92 ± 1.93 to 81.72 ± 1.57 mmHg and an appreciable fall in HR from 72.33 ± 3.62 to 69.67 ± 3.29 beats/min. RPP decreased from 81.29 ± 4.97 to 75.84 ± 4.17 units and Do P from 61.55 ± 3.80 to 56.95 ± 2.97 units ($p=0.06$).

Discussion and conclusion: It is concluded that 10 minutes of *kaya kriya* relaxation produces a significant reduction in BP. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and /or decreased sympathetic activity. Further studies with more subjects with control group and in different health conditions are required to understand the possible mechanisms underlying this beneficial effect.

3. IMMEDIATE EFFECT OF SHAVASANA AND SAVITRI PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

Introduction: Yoga has been shown to be an effective adjunct therapy in the management of hypertension. Earlier studies from our laboratories have shown beneficial effects of *savitri pranayama* in normal subjects. *Savitri pranayama* involves slow and deep breathing in the ratio 2:1:2:1 and has been studied in combination with other practices in hypertensive patients. The present study was undertaken to determine immediate effects of *savitri pranayama* and *shavasana* on cardiovascular parameters in hypertensive patients.

Methods: 6 hypertensive patients attending Yoga therapy sessions at ACYTER were recruited for this study. They were instructed to lie down in *shavasana* and perform *savitri pranayam* for 10 minutes. Heart rate (HR) and blood pressure (BP) were recorded before and immediately after the intervention. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: Statistical analysis revealed a highly significant ($p < 0.001$) reduction in mean pressure from 90.33 ± 1.77 to 85.11 ± 1.67 mmHg and Do P from 73.91 ± 6.23 to 65.35 ± 5.69 units. There was a significant ($p < 0.01$) reduction in HR from 81.50 ± 5.84 to 76.50 ± 5.78 beats/min, systolic pressure from 125.67 ± 4.42 to 117 ± 3.89 mmHg and RPP from 102.24 ± 7.58 to 89.20 ± 6.46 units. Diastolic pressure decreased from 72.67 ± 2.74 to 69.17 ± 2.74 mmHg, the decrease being statistically significant ($p < 0.05$).

Discussion and conclusion: It is concluded that 10 minutes of *shavasana* with *savitri pranayama* reduces HR and BP implying normalization of the cardiovascular autonomic regulatory mechanisms with increased vagal modulation and / or decreased sympathetic activity. Reduction in RPP and Do P signifies reduction in oxygen consumption and work done by the heart. Further studies with more subjects and control groups are required to understand possible mechanisms underlying this immediate and beneficial effect in hypertensive patients.

4. IMMEDIATE EFFECT OF CHANDRA NADI PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

Introduction: Yoga therapists routinely use *chandra nadi pranayama* to help reduce blood pressure (BP) in hypertensive patients. This is attributed to its stress lowering effects that have been documented by previous studies. Though there are some studies on the long term effect of *chandra nadi pranayama*, there are no studies on its immediate effect on cardiovascular parameters in hypertensive patients.

Methods: 26 hypertensive patients attending yoga OPD at JIPMER were recruited for the study. They were taught *chandra nadi pranayama* and instructed to perform the same for five minutes in sitting position. Heart rate (HR) and BP were recorded with non-invasive automatic BP apparatus before and immediately after the practice of *chandra nadi*

pranayama. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: There was a significant ($p < 0.001$) reduction in HR from 75.5 ± 2.78 to 70 ± 2.72 beats/min, RPP from 106.15 ± 4.53 to 96.06 ± 4.24 units and Do P from 76.36 ± 33.90 to 72.66 ± 33.36 units. A significant reduction ($p < 0.01$) occurred in systolic pressure (SP) from 140 ± 3.26 to 137 ± 3.12 mmHg and pulse pressure from 58.5 ± 2.78 to 50 ± 2.39 mmHg. There was a statistically insignificant rise in mean arterial pressure (MAP) from 101 ± 1.97 to 103.67 ± 2.01 mmHg and diastolic pressure (DP) from 81.5 ± 1.76 to 87 ± 1.76 mm Hg

Discussion and conclusion: *Chandra nadi pranayama* produced a significant decrease in HR and SP signifying a normalization of cardiovascular reflex mechanisms within 5 minutes. It also produced a significant fall in RPP and Do P signifying a reduction in oxygen consumption and work done by the heart. However the rise in DP and MAP is difficult to explain. Further studies with more subjects and control groups are required to understand the possible mechanisms underlying this immediate effect of *chandra nadi pranayama* in hypertensive patients.

5. IMMEDIATE CARDIOVASCULAR EFFECTS OF SHAVASANA AND PRANAVA PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

Introduction: The use of sound vibrations as part of relaxation in *shavasana* is taught in some yoga schools. The present study was planned to determine the cardiovascular effects of performing *shavasana* with *pranava pranayama* involving making *akara*, *ukara*, *makara* and *omkara nada*.

Methods: 19 hypertensive patients attending yoga therapy sessions at ACYTER were taught *shavasana* with *pranava pranayama* and instructed to perform the same for 15 minutes. Heart rate (HR) and blood pressure (BP) were measured with non-invasive semi-automatic BP monitor before and immediately after. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: There was a highly significant ($p < 0.001$) reduction in systolic pressure from 135.94 ± 3.51 to 126.21 ± 2.88 mmHg, pulse pressure from 57.26 ± 3.02 to 50.15 ± 2.35 mmHg, RPP from 106.45 ± 5.36 to 97.35 ± 4.91 units and Do P from 121.41 ± 63.17 to 110.21 ± 56.35 units. Diastolic pressure reduced significantly ($p < 0.01$) from 78.68 ± 1.74 to 76.05 ± 1.59 mmHg. There was statistically insignificant reduction in HR from 78.05 ± 2.91 to 76.78 ± 2.89 .

Discussion and conclusion: It is concluded that 15 minutes of *shavasana* with *pranava pranayama* can reduce BP in hypertensives. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and /or decreased sympathetic activity. It also produced a significant fall in RPP and Do P signifying a reduction in oxygen consumption and work done by the heart. Further studies are required to understand the possible mechanisms underlying this beneficial effect in hypertensive patients.

6. IMMEDIATE EFFECTS OF YOGA NIDRA ON HEART RATE AND BLOOD PRESSURE

Introduction: *Yoga nidra* is one of the special relaxation techniques of yoga. Previous studies have shown beneficial effects after different periods of training. The present study

was undertaken to study the immediate cardiovascular effects of *yoga nidra* on 20 normal subjects.

Methods: 20 healthy volunteers attended 20 minutes of *yoga nidra* sessions during a one month period. They were instructed to mentally observe the body part by part in association with breath. Heart rate (HR) and blood pressure (BP) were measured before and after a single session. Pulse pressure (PP), mean arterial pressure (MAP), rate-pressure product (RPP) and double product (Do P) were calculated by formulae.

Results: Statistical analysis showed significant ($p < 0.05$) reduction in HR from 79.3 ± 2.45 to 75.2 ± 1.84 beats/min, RPP from 88.21 ± 3.33 to 81.89 ± 2.38 units and Do P from 66.84 ± 2.60 to 62.52 ± 1.89 units immediately after the *yoga nidra* session. There was insignificant reduction in SP from 111.2 ± 2.21 to 109 ± 2.05 mmHg, PP from 40.6 ± 1.42 to 38.9 ± 1.50 mmHg, DP from 70.6 ± 1.36 to 70 ± 1.25 mmHg and MAP from 84.08 ± 1.55 to 83.15 ± 1.40 mmHg.

Discussion and conclusion: It is concluded that 20 minutes of *yoga nidra* practice can reduce HR, RPP and Do P in normal subjects. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and /or decreased sympathetic activity. The reduction in RPP and Do P signifies reduction in oxygen consumption and work done by the heart. Further studies are required to understand possible mechanisms underlying this beneficial effect of *yoga nidra*.

SYNERGIES IN HEALING: INTERNATIONAL CONFERENCE ORGANIZED BY KRISHNAMACHARYA YOGA MANDIRAM AT CHENNAI

Dr Ananda Balayogi Bhavanani, Programme Co-ordinator ACYTER presented a talk on “Rheumatological and immunological aspects of aging and importance of an integrated approach of yoga in senior citizens” during “SYNERGIES IN HEALING” organized by Krishnamacharya Yoga Mandiram at GRT Convention Centre, Chennai on 18 July 2010.

This international conference aimed at an integrative approach of yoga and modern medicine and was attended by more than 300 delegates from all over the country and abroad.

The eminent cardiologist Dr. S Thanikachalam from Sri Ramachandra Medical College was chief guest. Keynote was presented by Dr Ishwar V Basavaraddi, Director MDNIY and chaired by Yogashri TKV Desikachar, founder of KYM.



The inauguration was followed by invited talks by Dr. Arjun Rajagopal, Dr. Kausthub Desikachar, Dr. Prithika Chari, Dr. Uma Krishnaswami, Dr. Latha Satish, Dr. Michael Steinbrecher, Dr. AV Balasubramaniam, Dr. VD Swaminathan, and Mr. S Sridharan. The event received wide publicity in the local press and all delegates expressed their desire that such integrative conferences must be held more often.

YOGA CLASSES FOR NURSING STUDENTS

A lecture-cum-practice session on yoga, meditation and spiritual healing was conducted by Shri E Jayasettiaseelon, SRF for 90 students of BSc Nursing (final year) on 30 July. The students participated enthusiastically in the session and expressed the physical and mental benefits they felt after the session. He also gave talks on “*Yoga and Complementary Medicine*” on 2 and 23 July at the JIPMER Nursing College for the GFATM Nursing Workshop on AIDS / HIV while Dr Ananda Balayogi Bhavanani gave the talk for the participants on 9 July. The authorities of the nursing college have been giving excellent support for all activities related to yoga.

YOGA THERAPY OPD AT SUPER SPECIALTY BLOCK

Yoga therapy OPD of ACYTER is functioning on a regular basis in Super Specialty Block. During April to June, 967 patients (new 193 and old 774 cases) of various conditions attended consultation in the OPD with Dr Ananda Balayogi Bhavanani and Dr Zeena Sanjay. Patients who attended consultation were prescribed individualized and generalized yoga therapy for diabetes mellitus, hypertension, musculoskeletal disorders, respiratory disorders, stress and psychological disorders, endocrine disorders, coronary artery disease, GIT, neurology, and other complaints. Patients have reported benefits and expressed their thanks to ACYTER, JIPMER and MDNIY for this facility.

YOGA THERAPY SESSIONS

Yoga therapy sessions are being conducted on Mondays, Wednesdays and Fridays from 10 – 11 AM for patients of diabetes, 11 AM – 12 noon for patients of cardiovascular diseases and 12 noon – 1 PM for patients of other disorders. The yoga instructors, Shri G Dayanidy and Selvi L Vithiyalakshmi are conducting the sessions both individually and in groups as per directions of the therapists given in the OPD. Patients have reported satisfaction with the therapy sessions and are attending regularly. 194 patients of diabetes, 129 of hypertension and 436 of other conditions attended the sessions between April and June 2010.

REGULAR ACTIVITIES OF ACYTER

Regular yoga classes are being conducted on Mondays, Wednesdays and Fridays in both mornings and evenings. 157 participants attended the classes in the last quarter. Suryanamaskar, basic asanas, pranayamas and relaxation techniques are being taught in the general classes. Senior Citizen’s Clinic is being conducted every Thursday and 65 participants attended classes with Mrs. Meena Ramanathan, coordinator yoga courses, Pondicherry University Community College.

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