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1.0 ABSTRACT

INTRODUCTION

Nature has its own manner and timing of revealing itself. Yoga is one of such divine philosophy that it has revealed through the sages and Rishis of India. The second verse of Patanjali describes most of it. Yoga is to control the distractions of the mind. Once that is done it is easier to merge individual consciousness with supreme consciousness and be in a state of bliss free from the materialistic disposition and its allied pain and misery. Controlling the mind is to control the Prana which is part of consciousness. It is Shiva making effort to be Shiva. Pranayama helps to control the Prana and hence the mind. The uncontrolled fluctuations are the cause of diseases as that disturbs the homeostasis of the body. Through Yoga we can check it and that is why Yoga has become popular worldwide, namely for disease prevention and management.

From the alternative medicine, Electro photonic imaging (EPI) technique is emerging as a novel technique of measurement of the bio-energy of the body. Yoga intervention for improvements in homeostasis and monitoring the changes through Electro photonic imaging (EPI) technique is a desired holistic approach for monitoring health and happiness across the world. It is necessary to correlate EPI norms with the established biochemical parameters to have wide and scientific acceptability in modern medicine. There is a need for such study.

The study is in two parts. In the first part, a study of classical literature is presented wherein scriptural concepts on Prana and its relation to health is discussed. In the second part, experimental aspects of bio-energy are taken up and measurements using EPI is presented.

LITERARY REVIEW

The concepts of Prana, Pranamaya kosa and Pranayama have been drawn through various Vedanta and Shaivite literature. The relationship between Prana and Bioenergy has been described and also the effect of pranayama on the homeostasis of practioners, particularly the advanced Yogis. Prana has been described from many aspects and the Shaivite ways of merging Prana into supreme consciousness is the highlight of this classical literature study. At the physical level, measurement of Prana (which is referred as bio-energy in modern medicine) through Electro Photonic Imaging is investigated in detail in Part II of the Thesis.

In the scientific literature review, following domains of scientific studies were reviewed

1) Various studies conducted to find out EPI patterns in various diseases with major focus on diabetes.

3) Studies through Integrated Yoga Module.

Findings reveal that there is a need to study the effect of diabetes specific Yoga practices of SDM (Stop diabetes movement) module of S-VYASA through Electro photonic imaging EPI and also need for correlation of EPI parameters with Biochemical parameters

AIM

To identify EPI parameters that draw correlation with established Biomarkers of Diabetes type 2 and find efficacy of Stop Diabetes Movement (SDM) Yoga module through Electro Photonic Imaging (EPI).

OBJECTIVES

The objectives of this study are

a) To correlate FBS (fasting blood sugar) with EPI parameter in normal, pre diabetes and diabetes type2 Indian population.

b) To correlate HbA1c (glycated haemoglobin) with EPI parameter in normal, pre diabetes and diabetes type 2 Indian population

c) To look at diabetes type 2 from the prism of Electro Photonic Imaging. In that investigate

i. Changes in EPI parameters between normal, pre diabetes and diabetes.

ii. Changes in EPI parameters between controlled and uncontrolled diabetes.

iii. Effect of seven day SDM Yoga program as measured through EPI.

METHODS

Study of Prana and disease

To carry out this study, Shaivite and Vedanta scriptures were referred to and Prana traced from the consciousness → Prakriti → Jeeva (Life). It was found that Prana is bio energy at the cellular level and any disturbances due to internal or external conditions results in changes in this bio energy (*pertains to first part of the study*) . This can be measured by EPI (*pertains to second part of the study).*

1. Correlation of FBS with EPI parameters

A total of 200 participants from different yoga camps and Arogyadham, a residential health centre of Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA, Bengaluru, India) were assessed once. This was spread over 6 months. Among them 102

subjects were selected. They were categorized into three groups; a. Normal; b. Pre diabetes; c. Diabetes. Normal group comprised of 29 subjects (mean age 44±11years) and Pre diabetes group comprised of 13 subjects (mean age 51.2±12.3years). Diabetes group comprised of 60 subjects mean age 54±9.6years). Out of these 35 were males (mean age 56.83±8.72years) and 25 were females (mean age 50±9.4years). EPI was taken on the inaugural day of camp before the blood sample was taken for the measurement of fasting blood sugar (FBS). Subjects in the age group of 18-75 years of age were included in the study.

2. Correlation of HbA1c with EPI parameters

A total of 150 participants were scrutinised from different yoga camps and Arogyadham, a residential health centre of SVYASA were assessed once. This was spread over 6 months. Among them 86 subjects were selected. These were divided into three groups; a. Normal; b. Pre diabetes; c. Diabetes. Normal group comprised of 50 subjects (mean age 38.6±10. 2years). Out of these 25 were males (mean age 37.2±9.74 years) and 25 were females (mean age 40±10.7 years). Pre diabetes group comprised of 17 subjects (mean age 48±14.49 years). Out of these 14 were females (mean age 48±14.49 years) and rest were males (mean age 61±18.52 years). Diabetes group comprised of 19 subjects (mean age 51.05±10.29 years). Out of these 13 were females (mean age 49.31±10.96 years) and 06 were males (mean age 54.83±8.23 years) EPI technique was used to assess the subjects once on the inaugural day of camp before blood sample was taken for measurement of glycated haemoglobin (HbA1c) .Subjects in the age group of 18-75 years of age were included in the study.

3. Diabetes type 2 from EPI perspective

a. Comparison of EPI parameters among normal, pre diabetes and diabetes

One hundred and two subjects (mean age 51±11 years) were selected. Out of these 52 were males (mean age 54±11 years) and 50 subjects were females (mean age 47±10 years).These were categorized into three groups namely normal, pre diabetes and diabetes on the basis of their FBS score. Normal comprised of 29 subjects (mean age 44±11years); Pre diabetes comprised of 13 subjects (mean age 51.2±12.3 years) and Diabetes comprised of 6o subjects (mean age 54±9.6 years). The subjects were assessed on the inaugural day of the camp utilizing the Electro Photonic Imaging (EPI) technique.

b. Comparison of parameters in controlled and uncontrolled diabetes

Sixty subjects (mean age 53.8±9.62 years) were selected for the study. Out of these 35 were males (mean age 56.83±8.72 years) and 25 were females (mean age 49.56±9.38 years). The total subjects were categorized into; a. Controlled diabetes; b. Uncontrolled diabetes .There were 27 subjects (mean age 51±11 years) in controlled category and 33 subjects (mean age 51.97± 9.65 years) in uncontrolled category. The measurements were taken once before intervention.

c. Effect of 7 day SDM Yoga program on diabetes type 2 patients.

Thirty seven subjects (mean age 54.46±7.21 years) were selected for this study. There were 24 males (mean age 57.46±7.35 years) and 13 females (mean age 54.62±6.83 years). EPI measurements were taken in the pre and post stages of SDM Yoga intervention. The EPI parameters analyzed in these studies were Total area, Average intensity, Entropy, Fractality, Form coefficient, Integral area of Pancreas, Liver, Immune organs, Coronary vessels, Cerebral vessels, Left kidney and Right kidney.

DESIGN

Study of Prana and disease - Scriptures

Study 1- Survey design

Study 2- Survey design

Study3

i. Three-group comparative design

ii. Two-group comparative design

iii. Pre-post intervention design

ASSESSMENT TOOLS

Instrument of make Kirlionics Technologies International (KTI) company Saint-Petersburg, Russia (GDV camera Pro with analog video camera, model number: FTDI.13.6001.110310) was used for the assessment purpose.

DATA EXTRACTION

EPI Diagram and EPI Screening Software Program was used for data extraction for Integral area of Pancreas, Liver, Immune organs, Coronary vessels, Cerebral vessels, Left kidney and Right kidney. EPI Scientific laboratory was used for Total area, Average intensity, Entropy, Fractality, Form coefficient.

DATA ANALYSIS

Data analysis was done with the help of Microsoft Office Excel 2007 and R studio version 3.2.0 along with 'R Cmdr' version 2.1-7

RESULTS

Study1. Correlation and regression analysis was done by using "R Statistical Package". Regression analysis was done between FBS and EPI parameters (which ever showed significant correlation individually). The results were unique as different EPI parameters showed correlation with FBS in the three categories namely normal, pre diabetes and diabetes. A very noteworthy observation was the correlation of FBS with Left kidney and pancreas in the case of pre diabetes which is in conformity with modern medical research findings.

Study2. Correlation and regression analysis was done by using "R Statistical Package". The correlation between HbA1c and EPI parameters were not significant in all the three groups namely normal, pre diabetes and diabetes. The results were similar in correlation analysis as well in the regression analysis. This was a very noteworthy observation as EPI parameters indicate *current energy status* while HbA1c is the average of three months sugar levels in the blood cells. This again was in line with the research from modern medical science that there is no correlation between FBS and HbA1c and many studies do not recommend HbA1c for certain situations.

Study3.

i. Independent sample't' test was carried out between normal–diabetes, normal-pre diabetes and diabetes-pre diabetes. Results showed progression from normal to pre diabetes to diabetes stage in most of the organ specific parameters. The results indicated that as the disease progresses EPI parameters Total area and Average intensity increase in value, Fractality and Form coefficient decrease in value.

ii. Independent sample't' test was carried out between controlled and uncontrolled diabetes. There was no change in all parameters except that Immune organs. This could

be explained from the fact that when diabetes has taken its grip, most of the organs are affected and are low on homeostasis whether or not pathologically the results show controlled or uncontrolled diabetes.

iii. Paired‘t’ test was carried out on the EPI parameters in the pre and post conditions of SDM Yoga program. Results showed changes in the selected EPI parameters. The values of the parameters were moving closer to base values. How much change can make a pathological difference was beyond the scope of this research.

CONCLUSION

In Part 1 of the study, Prana was explored in detail and its link to bio energy established. Measurement by EPI is the measurement of a form of Prana at the cellular level. *In part 2* interesting results were achieved in respect of bio energy changes at Pancreas and left kidney in the pre diabetes stage and no correlation between EPI and HbA1c parameters. The gradual change in EPI parameters was noticed from normal to pre diabetic and diabetic stage. Not much of difference was observed in the parameters in controlled and uncontrolled diabetes and is due to effect of deterioration already set in. Seven days SDM program results in changes in the EPI parameters. How much change is the desired change for medical results was beyond the scope of this research.