EXECUTIVE SUMMARY

Food which is pre-digested and full of vitamins and minerals of all kinds should be taken to ful-fill all bodily requirements. Such food is safe to eat even when blood sugar levels are increased. Food substances should be selected for easy digestion, so that the digestive system works less as for progress on the spiritual path. This thesis hypothesized that *swarasa* (freshly prepared herbal juices) taken as a food supplement to replace breakfast has more therapeutic value than traditional breakfast, and are therefore to be preferred.

Many *Āyurveda* texts like *Yoga Ratnākara*, describe the subtle therapeutic importance of *swarasa* as well as whole herbs. This study discusses forms in which herbs should be taken, *Guṇas* of herbs and their food supplements, effects on the body, and quantities appropriate for best nutrition. Their many health benefits make raw foods like fresh fruits and vegetables, herbs, grains, nuts, and sprouted grains, with more vitamins and minerals than cooked foods. Important dietary components. All are healthy additions to a regular diet providing missing nutrients; nor do they deposit or develop disease-generating *Āma* (toxins).

Many studies have investigated food-related ingredients, such herbs to reduce sugar levels, for newly detected Type 2 Diabetes mellitus (T2DM). Others show how meal time relates to weight loss. Some show that yoga relaxation programs like Cyclic Meditation reduce sugar levels in both new and old T2DM patients. This study reports combined effects of *Rasāhāra* and Yoga.

In *Āyurveda*, diet is a primary pillar of health. Food is an internal factor contributing to health and disease. The review of ancient literature quotes texts stating the importance of *Āhāra-Vihāra* for *Prameha*. Right herbs in correct quantity can restore their health. The scientific literature review concerns importance of breakfast modification, properties of the

four herbs and yoga practices used to treat early T2DM and other diseases, to restore health and wellbeing.

The study aim was to conduct a 3-arm controlled trial assessing effects of *Rasāhāra* and *Yoga*, or *Yoga* only on T2DM, metabolic disorder, and *prameha* markers in early T2DM. Objectives included recruiting enough participants to obtain required significances; measuring 5 biomedical parameters every 15 days; pre-post assessment of 10 other biomedical parameters, *Āyurveda doša balas* and related variables; to maintain participants on a regimen restricting variations in diet and lifestyle; and to evaluate any adverse events or side effects**.**

Methods: The study was conducted at Bhopal Central Jail on male subjects, aged 18 to 70 years. Inclusion criteria: pre-T2DM patients with blood sugar levels, FBS: 100-170; PPBS: 150-220 mg/dl. Exclusion criteria: inability to practice *Yoga*; very low BMI; mental disorder; already with diabetes complications. Jail Hospital authorities helped with data extraction costs. The design was a three-arm controlled trial as above, with wait-listed controls under physician's observation. Interventions were as described above: the four *Rasāhāra* herbs were Wheatgrass **(***Triticum Aestivum*), *Āmalaki* (*Emblica officinalis Gaertn*), *Guḍuci* **(***Tinospora cordifolia*), and *Vāsā* (*Adhatoda vasica Nees*) The Yoga program for Diabetes to Group 1 & 2. Group 2 ate normal breakfast. Group 3 (Controls) followed their normal jail routine. Assessments measured T2DM Markers (BMI, HbA1c, FBS, & PPBS); related parameters, lipid profile, SBP, DBP & pulse rate, Haemoglobin and creatinine; Breath Holding Time (*Bhrāmari*), and *Doṣa Balas* and related *Guṇas*. Data collection was by blinded Jail Hospital personnel. All blood samples were analysed blind to participant groups and trial hypotheses at *Śagun* Pathology laboratories, Bhopal. Data analysis used Excel and Graph Pad QuickCalcs, and SPSS-20 at S-VYASA.

Results were as follows: for Conventional T2DM Markers BMI no changes; FBS and PPBS decreased for Groups 1 & 2, and increased for Group 3; Hb1Ac remained steady for Groups 1 & 2, but increased for controls. Blood lipid levels Groups 1 & 2 tended to improve values of 'good', and decrease values of 'bad, lipoproteins; Controls did the reverse. Heart and hypertension parameters showed *consistent decrease in standard deviations* for Groups 1 and 2 implying that Yoga's influence is to *normalize* blood pressure, correcting hypertension and raising low blood pressure: striking results. Changes in Hb levels were good in Group 1, none in Group 2, but decrease in Group 3. Changes in Creatinine levels: Groups 1 and 2 improved, but Group 3 got worse agreeing with other studies on Yoga and CKD. Group differences imply that Yoga helps prevent nephropathy, T2DM's deadly complication. Breath holding time increased significantly in both Groups 1 and 2 while it decreased in control group. Seasonal Change: systematic shifts at change of season were a *Post hoc* discovery of importance to all medical science. Though stated in *Āyurveda*, the phenomenon is not known to medical science.

This first study of *Rasāhāra* and Yoga for pre-diabetes in a prison setting in India shows that prisoners can benefit from yoga prison programs, especially those with elevated blood sugar and blood pressure levels. Follow-up studies should obtain more robust data so that Yoga may be added to India's prison programs. The study was the first to confirm *Rasāhāra*'s value as a food supplement replacing normal breakfast. Those not practicing yoga regularly increased BP and pulse rates. Initially, all participants showed increased *Kapha-Pitta Doṣa Balas* confirming *Āyurveda* texts. Group 1 improved in *Kapha-Pitta* more than Group 2, both did better on all *Dosha Balas* than controls, confirming the values of their interventions.

Results point to the efficacy of IAYT Yoga practice combined with strict *āhāra-vihāra* for treatment of newly diagnosed T2DM, especially benefits of breakfast modification. Addition

of *Rasāhāra* herbal juices is a cheap alternative to long-term use of chemical drugs, which fail to improve underlying pathology. They support all study hypotheses. Further studies of *Rasāhāra* treatment are merited, particularly in rural areas, where it would be easy to implement.