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REVIEW ON MANAGEMENT OF DIABETES WITH THE HELP OF NATUROPATHY

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Abstract:

Diabetes is becoming more prevalent in the Indian population as a result of changes in lifestyle. The effects of naturopathy treatment, salt-restricted low-calorie diets, and yoga on long-term glycemic management in individuals with type 2 diabetes mellitus are investigated in this study. Diabetes mellitus type 2 is a major global health issue. Diabetes, mostly type 2, affects 5.2 percent of the world's adult population, according to the World Health Organization. With a prevalence of 10.4 percent and a population of almost 19 million people, India currently has the world's highest population of people with type 2 diabetes. By 2045, India is anticipated to have the biggest growth in prevalence worldwide (84 percent increase). This rise is due to an increase in life expectancy as well as changes in lifestyle, such as fewer healthful foods and inactivity. To avoid a rise in the prevalence of type 2 diabetes, countries must improve prevention, present review focus on management of diabetes with the help of naturopathy.

Key words:*Management, Diabetes, Naturopathy.*

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INTRODUCTION:

Naturopathy is a drugless, noninvasive, rational, and evidence-based system of medicine that imparts natural therapies, based on the theory of vitality, toxemia, the self-healing capacity of the human body, and the principles of healthy living. This approach to health care emphasizes education, self-responsibility and therapies to support and stimulate an individual's self-healing capacity. The principles of naturopathy were first used by the Hippocratic School of Medicine in approximately 400 BC. The Greek philosopher Hippocrates believed in viewing the whole person in regards to finding a cause of disease, and in using the laws of nature to induce a cure[1].

Public health and naturopathy-intersecting paradigms:

Public Health (PH) is defined as ‘‘the science and art of pre venting disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals.” [2] The philosophical approaches of naturopathy include disease prevention, encouragement of the body's inherent healing abilities, natural therapies, personal responsibility for one's health, and education of patients regarding health-promoting lifestyles. [1] Thus there are substantial areas of overlap between naturopathy and PH such as a focus on health rather than disease; a preventive approach; and an emphasis on health promotion, health education, and patient empowerment.

Naturopathy and chronic diseases:

Chronic lifestyle diseases are now the leading cause of disease burden and morbidity globally which are attributable to modifiable health behaviors such as tobacco use, poor diet, and physical inactivity. [3-4]Public Health can look to naturopathy for answers to some of these challenges through different natural therapies, many of which can take a role in primordial and primary prevention of several diseases. By contrast, PH can identify mechanisms to effectively deliver principles of naturopathy such as improved public access to naturopathic physicians in community clinics, increasing formal collaboration between naturopathic and other health professionals, or increasing the number of trained integrative medicine providers.

Some selected naturopathic therapies:

Nutrition:

Food is regarded as medicine in naturopathy. Good nutrition is the foundation of naturopathic practice for health promotion and disease prevention. Foods are considered best in their natural form, when obtained locally and eaten seasonally.

Hydrotherapy:

Hydrotherapy is the external or internal application of water in any of its forms such as ice, water, steam. Hydrotherapy uses temperature effects of water, as in hot and cold baths, steam baths, compresses and fomentation, saunas, wraps, and immersion baths. Other modalities include spinal bath, sponge bath, hip bath, sitz bath, enema, and colon hydrotherapy.

Fasting therapy:

Fasting is primarily the act of willingly abstaining from some or all food, drink, or both, for a period of time during which the body excretes huge amounts of accumulated wastes. Methods of fasting include water, fruit juices, lime juice, or raw vegetable juices.

Yoga:

Yoga is a Hindu spiritual and ascetic discipline which includes breath control (pranayama), simple meditation, and the adoption of specific bodily postures (asanas). The aim of practicing pranayama is to stimulate, regulate, and harmonize vital energy of the body. Asana means holding the body in a particular posture to bring stability to the body and mind.

Behavioral therapy:

Naturopathy focuses on assisting clients in identifying and modifying unwanted behaviors through basic counseling, lifestyle modification, hypnotherapy, meditation, and stress management. To achieve this, it is essential to spend quality time listening to the patient so as to understand the way they live and to strengthen the physicianepatient relationship. It has important implications in behavioral modifications, which is the mainstay of treatment of chronic diseases.

Health promotion:

Health promotion is deep-seated in the practice of naturopathy, both philosophically and in the delivery of health care. Studies of naturopathic practice have shown that health promotion counseling on diet, physical activity, and stress management is incorporated into almost every clinical encounter (80-100%) and is reinforced in subsequent patient visits. [5-6]However, conventional care has low rates of health promotion practice ((<35-40%).[7] Thus, at the individual and community levels, health promotion could benefit from closer collaboration with naturopathy.

Trends in the use of naturopathy worldwide:
Patients are increasingly seeking naturopathic therapies for many reasons, the most common of which is patients wanting to use all possible modalities of care. Other important reasons include a holistic approach that addresses the root of the problem, more time and attention from the doctor, concern about the adverse effects of drugs, more control over the treatment, and having not been helped by conventional care [8].Nearly 80% of the population in developing countries depends on traditional systems of medicine as a source of primary healthcare [9].

Policy environment for naturopathy in India:
The Alma-Ata declaration recognized the value of traditional systems of medicine and advocated the integration of safe and effective traditional medicine practices into primary health care[10].The World Health Organization has urged its member states to integrate complementary and alternative medicine (CAM) into their national health care systems. The National Policy on Indian Systems of Medicine and Homoeopathy 2002 emphasized the need for a meaningful phased integration of the Indian Systems of Medicines with modern medicine. The government of India also has iterated that the Indian Systems of Medicine offers a wide range of preventive, promotive, and curative treatments that are costeffective and efficacious[11].There is a need to end the long neglect of these systems in our health care delivery mechanism.

Introduction to Diabetes:
Type 2 diabetes mellitus is a chronic metaboliclifestyle disorder characterized by an abnormallyelevated level of blood sugar and excretion ofexcess glucose through urine. Its prevalence isgrowing rapidly throughout the world affectingapproximately 285 million people worldwide, thatwill increase to 439 million by 2030 [12-13].

In type 2 diabetes mellitus, insulin is reduced quantitatively.The target cells are hypo responsive to insulin resulting in hyperglycemia as well as glycosuria and if uncontrolled, can lead to multiple complications including ischemic heart disease, stroke, blindness, limb amputations as well as dysfunction of nerves and kidneys [14].

The human and economic toll of type 2 diabetes mellitus is likely to grow globally in the foreseeable future due to increasing rates of urbanization, ruralurban migration, physical inactivity, adoption of sedentary life style and unhealthy diet habits [15-16].

Nature cure believes that all the diseases arise due to accumulation of morbid matter in the body and if scope is given for its removal, it provides cure orrelief.Naturopathy is feasible, safe and compatible with other treatment systems in offsetting chronic diabetic conditions like hyperglycemia, hyperinsulinemia and insulin resistance with reduced population burden of diabetes. It may primarily stress to correct all the factors involved like glucose intolerance, insulin insensitivity, obesity, dyslipidemia, hypertension and stress and then allow the body to recover itself [17].

Naturopathy intervention:
The Naturopathy intervention was provided as a residential treatment for a period of four months at Bapu Nature Cure Hospital &Yogashram. The sessions were conducted five times in a week for first month, thrice in a week for second month, twice in a week for third month and once in a week for fourth month. Naturopathy session included Mud pack (20 minutes), Massage (20 minutes), and Hip bath (20 minutes).

Mud Therapy:
Mud pack was applied to the patients of interventional group for 20 minutes over the abdominal region on empty stomach by the use of clay pack which is free from contamination. It helps to correct the imbalance of the digestive and endocrinal organs, which remain under active in diabetic patients resulting in accumulation of toxins. Mud pack on abdomen absorbs heat and produces soothing and cooling effect. It also improves blood circulation, removes congestion and tones up the tissues and organs [18-20].

Massage Therapy:
Sesame oil was smeared on the abdomen and spine to the patients of interventional group for 20 minutes which enhances not only blood circulation but also tones up the muscles while improving structural and functional status and hence insulin sensitivity. Massage also generates heat with increased circulation of blood bringing down all the impurities to the channel and expelling through sweat or urine. It is thus highly beneficial in the treatment of diabetes [21].

Parameters of Yoga and Naturopathy Treatments
Height: Height is measured using a stadiometer in centimeter round of to the nearest whole digit.
Weight: Weight will be quantified using a digital weighing machine to the nearest 0.5kg.

Body mass index: From the height and weight BMI will be calculated with the formula weight inkilogram divided by the square of height in meters[22].

Waist-hip ratio: A non-stretchable tape is used in measuring the circumferences. Hip circumference will be measured at the level of greater trochanter and parallel to ground. Waist circumference will be measured at the level of lower margin of last palpable rib in mid axillary line and parallel to floor.Measurement will be made to the nearest centimeter. Waist to hip ratio will be calculated by dividing the waist by the hip circumference.

Skin fold thickness: Skinfold thickness will be measured with Slim guide caliper. Skinfold thickness is measured in millimeters; it is designed to exert a contact surface pressure of 10 g/mm2. Skin fold thickness for males is measured upon triceps, subscapular skinfold thickness (SBS) and chest. Skin fold thickness for females is measured upon triceps, suprailia skinfold (SPS) and abdomen. Two measurements will be taken at each site at least 15 seconds apart and the mean of the two readingswill be recorded[23].

Body fat analyzer: Body composition will be measured by using Body stat 1500. The electrodes areplaced on the foot and hand for recording. Electrodes are placed sideways so that the non-stickelectrode connector point is facing the researcher.

- **Foot electrodes:** One electrode is placed centrally, directly where the second and third toemeet the foot. The second electrode is placed at the crease of the ankle (midline to the 'bony'landmarks). Two alligator clips are attached to the electrodes (red nearest the toes, blacknearest the ankle).
- **Hand electrodes:** One electrode is placed centrally, directly below the third knuckle of themiddle finger. The second electrode is placed on the crease of the wrist (midline to the 'bony'landmarks). Two alligator clips are attached to the electrodes (red nearest the fingers, blacknearest the wrist) and reading is taken.

Blood pressure measurement: Blood pressure will be measured in a quiet and calm environment using digital sphygmomanometer (Schiller) and values such as systolic blood pressure (SBP), diastolic blood pressure (DBP), mean arterial blood pressure (MAP) and pulse rate (PR) are noted.

Heart rate variability (HRV): The HRV will be recorded for 5 minutes pre and post intervention (total 5 recordings during the study period). The Electrocardiogram (ECG) will be recorded by using AD instruments 8 channel polygraph. The HRV waveforms will be analyzed.

Biochemical parameters:
Under aseptic conditions, 4 mL of patient blood sample will be collected 8 hours after last meal in asterile vacutainer by venipuncture. Serum will be obtained after centrifugation at 3000 rpm for 5 minwhich is stored at -40oC for further analysis.

Fasting blood glucose (Hexokinase method), HbA1c (HPLC method), extended lipid profile whichincludes total lipid profile (total cholesterol, High density lipoprotein cholesterol, triglycerides – byenzymatic methods, low density lipoprotein cholesterol – by direct method) ApoA1, ApoB andlipoprotein (a) – by immunoturbidimetry. Fasting insulin – by enzyme linked immunosorbent assay (ELISA - DRG- INS kit)

Post prandial blood glucose level: The patient will be made to take 75gm of oral anhydrous in wateror food with equal glucose load. The blood samples will be collected after 2hrs of consumption forserum glucose estimation.

Insulin resistance: Insulin resistance is calculated by using Homoeostasis model assessment**Inflammatory marker:**hs-CRP – ELISA technique

Pro-oxidant and Antioxidant Markers: myeloperoxidase, advanced oxidative protein products, protein carbonyls, superoxide dismutase – ELISA technique

Quality of life: The quality of life (QOL) of the participants will be assessed at the baseline and at the end of 9th month by using a standard questionnaire specifically designed for diabetes individuals Diabetes quality of life (DQOL) – short version based on Classical Test Theory (CTT).

Cardiovascular risk assessment: The risk of developing cardiovascular disease will be quantified by using Ten-year Framingham coronary risk score.

YOGA AND NATUROPATHY INTERVENTION PROTOCOL:

A fixed protocol for 10 days is prepared with the previous clinical experiences; necessary minor day to day changes will be made by N&Y physician on day to day basis. In case of any adverse event during the intensive phase the subject's data will be excluded from the final analysis. Treatment will be given by trained therapists in the common treatment section and duration of the particular treatment will be individually monitored with wall clocks available in each treatment room. The treatment protocol and diet chart for 10 days is given.Yoga intervention will be given in common yoga class, individual attention will be given to the individual subjects. Daily 60 min Yoga session will be handled by N&Y physician. In the 3rd and 7th day Yogic Kriya will be thought to

the subjects under supervision of N&Y Physician . The subjects will be counseled after post data assessment about the importance of following similar diet and yoga practice in home for better results. They will be provided with a diary to write the adherence to the newly developed life style and diet pattern. The diary contains specific pages for marking day to day activities. The diary will be assessed by the data collector after the study period.

Clinical Risk Factor Changes during Naturopathic Care for Type 2 Diabetes:

A retrospective, observational study was conducted based on data abstracted from medical charts between December 2006 and June 2007. The study was approved by the Bastyr University Institutional Review Board. Medical charts were identified through clinic scheduling software, searchable by International Classification of Diseases, 9th Revision (ICD-9) codes. This study included patients meeting three inclusion criteria: (1) an ICD-9 assessment of T2DM was made, (2) evidence of at least 6 months of naturopathic care between 2001 and 2006 was available, and (3) N.D. care was provided specifically for diabetes (versus accompanying symptoms). Using either too short or too long a time period as an inclusion criterion results in inherent bias. Including only those patients who have maintained care for too long a period leads to selection bias (e.g., oversampling of the uniquely motivated); allowing too short a time period and we may underestimate the effects of a care process, recognizing that especially the lifestyle elements of care may take some time for patients to adopt. 6-month duration of care was specified in an attempt to balance bias between either extreme.

Collected data included patient demographics, dates and duration of care, frequency of clinical visits, clinical service utilization, characteristics of care including treatment recommendations, physical examination findings including blood pressure and results of clinical laboratory risk factors including HbA1c, LDL=HDL cholesterol, and triglycerides.

To describe any changes in the distribution of clinical risk factors in the sample, two-tailed, paired *t* tests for homogeneity were applied to laboratory values and blood pressure from the patient's first visit compared to the most recently available value at the time of chart abstraction. Laboratory values within 3 months of the baseline visit were included as acceptable baseline values.

In addition to calculating average changes in risk factors, three priori-specified definitions were applied to the data to further quantify the degree of clinical change. The percentages of patients achieving (1) ''new ADA control,'' (2) ''clinically significant improvement,'' and (3) ''any improvement'' were calculated. ''New ADA control'' equates to control of risk factors per the American Diabetes Association definition during the period of N.D. clinical care, if the patient was ''uncontrolled'' at the beginning of care.

The ADA definitions for risk factor control are: <7% for hemoglobin A1c, <130 mm Hg for systolic blood pressure, <80 mm Hg for diastolic blood pressure, <100 mg=dL for LDL cholesterol, >40 mg=dL for HDL cholesterol, and <150 mg=dL for triglycerides.8 ''Clinically significant improvement'' was defined for each risk factor based on the minimum change deemed clinically important; for our purposes, ''clinically significant improvement'' equates to the following: a minimum 0.5% reduction in HbA1c, a minimum 10% decrease in LDL cholesterol, a minimum 10% increase in HDL cholesterol, a minimum 30% reduction in triglycerides or a 5 mm Hg reduction in SBP or diastolic DBP blood pressure from the beginning of care to the most recent measure. ''Any improvement'' was the least strict definition and equates to any improvement in the measured risk factor from the beginning of care and the most recent measure available .

Observationsof the Clinical Risk Factor Changes during Naturopathic Care for Type 2 Diabetes:

There were 123 candidate patients assessed with T2DM during their naturopathic care between 2001 and 2006; 37 of 123 (30%) met inclusion criteria for detailed abstraction in this study. The most common reason for chart exclusion was that the duration of care did not meet the 6-month minimum; 76 of 123 (62%) charts were excluded for this reason. For these 37 patients, data from 418 total visits was abstracted and included in analyses; on average, patients attended 11 naturopathic visits over a 27-month duration of care. The average age for those patients meeting inclusion criteria was 62 years. Female gender was more common (58% female), and considerable racial homogeneity (80% white) was observed in the patient base receiving N.D. care for T2DM at the study clinic. Care for T2DM was predominantly adjunctive care (80%) versus primary care (20%) during our observation period.

A high frequency of health-promotion counseling was observed during N.D. clinical practice. Health-promotion advice was given to 100% (diet), 92% (exercise), and 47% (stress reduction) of patients. Health-promotion recommendations were reiterated

or modified in subsequent clinical encounters; 63%, 35%, and 16% of total visits included advice on diet, exercise, and stress management, respectively.

Recommendations for utilization of available integrated services (nutrition, psychological counseling, and other CAM services) were common: 32% (nutritionist), 11% (Ph.D. psychologist or N.D. counselor), 26% (acupuncturist), 18% (homeopath), and 18% (N.D. manual therapy provider).

Repeat clinical laboratory or physical examination data were available for HbA1c, LDL=HDL=triglycerides, and blood pressure in 31=37 (84%), 29=37 (78%), and 37=37 (100%) of patients, respectively. On average, significant improvements in risk factor distributions were achieved for HbA1c, and SBP and DBP. The average changes in LDL and HDL cholesterol over the course of the observation period did not reach statistical significance. The average baseline values of select clinical risk factors and reports average changes.

The frequency of clinical improvement achieved by patients during the observation period. Patients appear to make graded improvement on all measured risk factors over the course of N.D. care for diabetes. As shown, the majority of patients show improvement during their course of N.D. care, with considerable proportions of patients achieving clinically important risk factor improvements.

Of note, ‘‘new control’’ for HbA1c, SBP and DBP (per definition 1) was achieved in an additional 26%, 16%, and 27% of patients, respectively, despite a considerable percentage of patients being ‘‘under control’’ at baseline for these measures (HbA1c: 55%, SBP: 30%, and DBP: 30%). Baseline control was rather high for HDL (93%), which may explain why few additional patients achieved ‘‘new control’’ for HDL; baseline control was less common for LDL cholesterol (41%). Regardless of baseline control, approximately 25% still achieved a clinically significant improvement in cholesterol risk factors, per definition.

This report suggests that clinically important risk factors reductions are achieved during N.D. care for T2DM. Healthpromotion counseling, including dietary change, exercise, and stress reduction, appear to be fundamental elements of N.D. practice.

These high rates of health-promotion counseling contrast with those estimates reported from conventional, allopathic primary care[24]. It is possible that this self-selecting patient cohort is more receptive to individual health-promotion counseling, yet it is also likely that the N.D. standard is to recommend lifestyle modification in practice in an effort to affect the patient’s readiness to change. As lifestyle change has a considerable impact on mortality in patients with cardiovascular disease (CVD), and because T2DM is considered a CVD equivalent, optimizing delivery and receptivity of health-promotion messages in clinical practice remains a critical and fundamental challenge to reducing chronic disease risk [25].N.D. practice appears to be an existing model of health-promotion counseling in physician practice, though controlled evaluation is necessary.

Nutritional and botanical supplementation is also recommended commonly. Numerous nutritional supplements were prescribed, and many have clinical trial evidence for effect in T2DM[26]; a review of the level of evidence of nutritional supplementation used in naturopathic practice has been reported elsewhere[27]. Unfortunately, the relative contribution of each supplement or combination of supplements to the observed changes in clinical risk factors cannot be determined from this study design due to its limited statistical power; logistic regression analyses in larger, controlled samples would necessary to determine promising supplements and/or supplement combinations.

Objective clinical risk factors were moderately well controlled for most patients at baseline; however, additional improvements were observed during the course of N.D. care. Observed changes in clinical risk factors in this cohort are clinically meaningful. An additional average reduction in HbA1c of 0.65% corresponds to an approximate 14% risk reduction for microvascular complications[28]. In addition, the observed SBP and DBP reductions are clinically meaningful; a 5 mm Hg reduction in SBP and DBP are comparable to estimates of blood pressure reduction achieved through lifestyle modification and correspond to approximately 25% and 50% reductions in relative risk for cardiovascular event, respectively. Although changes in the distribution of cholesterol measures did not meet statistical significance, 25%–28% of patients had at least 10% improvements in HDL and LDL, respectively. A near perfect linear relationship exists between LDL reduction and risk reduction for coronary event; a 1% reduction in LDL corresponding to a 1% reduction in risk.20,21 Additive risk reduction is achieved through HDL elevations, with a 1% increase in HDL corresponding to a 1% reduction in risk[29].

Although this report suggests that clinical risk factor improvements occur during the course of N.D. care for T2DM, this study has several important limitations. Most notably, since many patients are utilizing naturopathic services as adjunctive care, and patients self-select N.D. services, the generalizability of these findings in more diverse populations is unknown. As evidenced by the mean levels of clinical risk factors at the beginning of care, patients continuing with N.D. care for T2DM appear to be moderately well controlled (i.e., a relatively healthy cohort despite diabetes). This observation, plus the lack of a natural history control or conventional care control, suggests the possibility of bias in the reported estimates of clinical change. These findings are biased, by design, in favor of those patients who continue with N.D. care for at least 6 months, who may be exceptionally motivated regardless of their exposure to N.D. care. In addition, the risk factor reductions reported here are unadjusted estimates of change over the course of care, comparing baseline values to the most recent values in the medical chart. Therefore, they do not describe the longitudinal time course of change. Also, we performed analyses on limited risk factors understanding that additional risk factors may be altered throughout the course of N.D. care and remain unquantifiable by this analysis; similarly, this description does not include any measures of patient experience with N.D. care.

A further limitation is that the contributions of medication modifications to the observed changes cannot be determined using these descriptive analyses. A high prevalence of use of pharmaceutical medications for glucose (54%) and blood pressure (70%) was observed at baseline. Medication change, including either new medications or increases in medication dosage, was evident for 10=37 (27%) and 7=27 (26%) of observed cases for glucose and blood pressure medications, respectively. Evidence of medication discontinuation or dosage reduction was available for 4=37 (11%) of patients. Interestingly, in several circumstances, a recommendation to improve adherence to already prescribed medications, or a recommendation for the patient to return to their primary care physician for medication management, was recommended in the N.D. treatment plan, suggesting recognition of a need for additional, or optimal, medication management. It is nearly impossible to quantify the effect of this type of naturopathic advice on patient self-management.

Ongoing studies are in progress to evaluate risk factor changes longitudinally over time to determine the relationship, if any, between duration of care and the observed changes in risk factors and to determine the average rate of change. In addition, controlled, observational studies have just begun to evaluate the promise of N.D. care in a more generalized, managed care patient population.

CONCLUSION:

According to a study, using naturopathic techniques to diabetes control has positive results. Yoga, pranayama, and walking help to control blood sugar, reduce the risk of cardiovascular disease, and lose weight, all of which help to improve diabetic symptoms. Dietary changes have been shown to not only treat diabetes but also enhance general health. A balanced diet helps to decrease the chronic aetiology of diabetes by regulating metabolic disruption.

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