Review Article

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MANAGEMENT OF PRAMEHA (DIABETES MELLITUS) WITH YOGA AND EXERCISE: A REVIEW

Rajpreet Singh [1]*, Veenu Malhotra [2], Kavita M. Vyas [3], Shashikant Bharadwaj [4], Rimpaljeet Kaur [5]

[1]P.G. Student, Department of Ayurveda Samhita and Siddhanta, Babe Ke Ayurvedic Medical College & Hospital, Daudhar, Moga, Punjab, India

[2]Associate Professor, Department of Ayurveda Samhita and Siddhanta, Babe Ke Ayurvedic Medical College & Hospital, Daudhar, Moga, Punjab, India

[3]Assistant Professor, Department of Ayurveda Samhita and Siddhanta, Babe Ke Ayurvedic Medical College & Hospital, Daudhar, Moga, Punjab, India

[4]Ayurvedic Medical Officer, Rajiv Gandhi Govt. Post Graduate Ayurvedic Medical College & Hospital, Paprola, Kangra, Himachal Pradesh, India

[5]Assistant Professor, Department of Kaya-Chikitsa, PG school of Ayurveda, Desh Bhagat University, Mandi Gobindgarh, Punjab, India

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***Corresponding author**
E-mail: rr22859@gmail.com

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ABSTRACT

Prameha (Diabetes Mellitus) is a syndrome with disordered metabolism and inappropriate hyperglycemia either due to a deficiency of insulin secretion or due to a combination of insulin resistance and impaired insulin secretion to compensate glucose level in blood. Type 1 DM (Diabetes Mellitus) is due to the destruction of pancreatic Islet β cell by an autoimmune process. Type 2 is a more prevalent and common form of Diabetes Mellitus and results from insulin resistance with a defect in compensatory insulin secretions. In Ayurveda, diabetes is commonly known as Prameha. It is categorized as Vataj (dryness), Pittaj (fire) and Kaphaj (oiliness). The dominance of kapha dosha in prameha defines that the pittaj and kaphaj types are easily curable with the medication due to their compatibility with dushyas (tissues that are vitiated by doshas) they categorized under Type 2 DM. The Vataj prameha afflicts the deeper dhatus (essential tissues) like majja etc. for which they have very serious nature, they are incurable, cause many complications and acute emergency conditions. If all forms of pramehas are not treated eventually develop into Madhumeha (Vataj) (chronic stage of DM). To overcome the adverse effects of medications some efforts should be done to control Prameha with pranayama (nostril breathing), yoga nidra (body relaxation), dhayana (meditation), paschimottan asanas, ardhamatsyendra asana, sarvanga, savasana etc. with proper dietary habits by avoiding starchy food, fibers and proteins. The aerobic exercises should also be performed to reduce the metabolic risk factors in prameha.

Keywords: Prameha, Diabetes mellitus, Yoga asanas, Compatibility, Pancreas, Insulin.

INTRODUCTION

Yoga and physical exercise has been considered as one of the cornerstone in the management of prameha (diabetes mellitus) along with the nutrition and drugs. It is a chronic metabolic disease which can be characterized by an increase in the blood glucose level resulting from an insulin deficiency (in IDDM) or insulin resistance (in NIDDM) or both. The adverse affects are that it leads to glycation of tissue, which proceeds with acute metabolic disturbances as it sometimes ends with organ damage and many other complications such as neuropathy, prameha pidika (carbuncles), retinopathy, nephropathy and CVD etc. According to Ayurveda, the disease is classified into three types i.e. Vataj, Pittaj and Kaphaj Prameha. While comparing the classification of Prameha with Diabetes Mellitus of modern medical science then we may find that the Vataj Prameha is categorized under IDDM (Type 1 Diabetes Mellitus or Insulin Dependent Diabetes Mellitus) because of its bad prognosis and hereditary origin[1] and incompatible nature of its doshas and dushyas.[2] It could also be considered that the vitiation of Vata in the body can hinder the secretions of pancreatic juices including the insulin from pancreas. On the next hand the other two forms of Prameha i.e. Kaphaj and Pittaj may be categorized under NIDDM (Type 2 Diabetes Mellitus or Non-Insulin Dependent Diabetes Mellitus) according to their fatty or obese body physique[1] and compatible nature of doshas and dushyas[2]. The patients fall under this category can be treated with medication, Yoga and exercise. Type 2 DM is more common as 95% population covers within it than Type 1 DM which covers 5% population only. Regarding the management of Type 2 DM, researchers have highlighted the use of modern medicine, herbal medicines, yoga and exercise management therapy.

Need for the Study

The adverse effects of the modern medicines are also challenging, and it cannot be ignored. Therefore to overcome these adverse effects the physical activities like Yoga and exercise is considered as the beneficial treatment regimen for the management of Type 2 DM. So the effort is made to explore the significance of Yoga and exercise and its effects in Type 2 DM. while studying the literature and published journals.[3]

Mechanism of Yoga and Exercise in Prameha (Diabetes Mellitus)

Prameha is well known for having macro and micro vascular complications, which later proceeds to life threatening conditions e.g. prameha pidikas (carbuncles) arises due to the complication become incurable without the intervention of surgeon.[4] Mortality and Morbidity rate in prameha is increasingly therefore effective management with less adverse

effect is mandatory for mandatory disease. Yoga and exercise training programs are alternative therapeutic regimen for both types of diabetes. But these yoga and exercise influences Type 2 DM more than Type 1 DM. Since it is an adult-onset disease and shows a promising effect on the community. While studying the pathogenesis of disease it is considered that prameha occurs due to the blockage of srotas (channels of circulations) by the vitiation of doshas which vitiate the dushyas (vitiated tissue elements) and move them (dushyas) to the urinary bladder or urinary srotas (passages) to develop the disease.[5] When the yoga or exercise is performed, the svedana (fomentation or sweating) occurs in the body which causes the elimination of doshas and mala by loosening the srotas[6] and also accumulated doshas get the passage to travel to their prakritika (normal) place. The increase in skeletal muscle glucose uptake during yoga and exercise via glucose transporter 4 (GLUT 4) is responsible for reducing blood sugar level in Type 2 DM.[3] Acharya Charaka also mentioned in Charaka Samhita that prameha gets immediately cured by different types of strenuous exercises[7], therefore due to regular yoga and exercise the aggravated kleda (oiliness), medas (adipose tissues) and kapha (heaviness) are minimized this can also be due to administration of depletion therapy[8], as these are the factors responsible for causation of prameha. As mentioned in a journal while discussing the relationship between pancreas and diabetes, there is no direct reference but considering indirect reference available in the ancient text books, the author has outlines a new hypothesis that pittadharakala (squamous cell layer which secrete the digestive enzymes in duodenum) described in Susruta Samhita in Atisara Chikitsa[9] can be equated as the "Islet tissue" of pancreas and pittatejas (insulin) produced from the pithadharakala as the hormone like insulin, glucagon. The author differentiated the functions of pittatejas (insulin and glucagon) with the functions including the intestinal tract (duodenum) which concluded that the thinking indicate the fact that ancient physicians of India had a strong view on the role of functions taking place at grahani (duodenum) to the carbohydrates and its impact in the production of diabetes. It may also concludes that yoga therapies like kapalbhati and Uddiyan bandh plays the important role to maintain the normal condition of agni (digestive fire) at grahani (duodenum) to normalize the metabolic process of body, which also helps to improve the functions of insulin.

The yoga therapies (yogic postures which produce relaxation) counteract the factors which are mainly responsible for developing the prameha such as:

1. The food stuff which has properties of Brmhana (more carbohydrates and fat than protein) can be countered by ardhamatasaya asana.
2. Food containing snigdha guna (oily or slippery) can also be countered by paschimottanasana and sarvanga asana which reduces the meda (fat) kleda (oiliness) of body by stretching of back and legs or with the help of shoulder stand.
3. The habit of eating and smoking can be countered by pranayama (nostril breathing).

Apart from these all factors, excessive mental stress, emotions and constant worry are also responsible for the development of prameha (diabetes mellitus), which can be controlled by the regular use of pranayama (rhythmic respiration), yoga and meditation.

Acharya Charaka divides the patients of prameha into different categories and suggests suitable management in each category according to condition and age of patient along with the intensity of disease. Some are cured by panchkarma therapy (detoxification) along with anti-hyperglycemic drugs. Some are cured by exercise and yoga. The yoga and exercise can enable higher utility of glucose by human body (concluded by Dr. Vranic of Canada).[10]

Obesity is the most important environmental factor causing insulin resistance. Visceral obesity is due to accumulation of fat in the omental and mesenteric regions, correlates with insulin resistance, subcutaneous abdominal fat seems to have less of an association with insulin insensitivity. There are many patients of Type 2 DM who, while avert obese, have increased visceral fat, they are termed as "metabolic obese." Exercise and yoga can affect the deposition of visceral fat. The daily vigorous exercise and yoga program prevents accumulation of visceral fat and they have normal serum lipid and euglycemia despite taking daily 5000-7000 kcal and development of massive subcutaneous fat. Several adipokines, secreted by fat cells, can effect insulin action in obesity but some other like -tumor necrosis factor, which inactivates insulin receptors, and resistin, which interfere with insulin action on glucose metabolism. As these two factors have been reported to be elevated in Type 2 DM. Abnormal levels of adipokines may contribute to the development of insulin resistance in obese patient. These adipokines are normalized by the yoga and exercise which can maintain the normal working, size and metabolism of fat cells and keep a normal check on the adipokines secretions by them.[11]

Specific Yoga recommendations in Prameha (Diabetes Mellitus)

Kapalbhati Breathing: This breathing technique cleanses the body and pacifies autonomous nervous system, thereby having a beneficial effect on the blood vessels and various organs of the body. Kapalbhati cleanses the lungs and entire respiratory system. The blood is purified and body gets an increased supply of oxygen to all cells. Digestion is improved. Abdominal muscles are strengthened. Stimulation of all Vegas nerve by contraction of abdominal muscles has a beneficial effect in the reduction of depression and normal insulin secretion from pancreas.

Alternate Nostril Breathing: This breathing technique soothes the nervous system and enhances sleep quality. By enabling to focus on breath and deepening it, the brain will register a message for nervous system to move from stressed to a relaxation response. Breathing just through left nostril (by blocking off right nostril) can direct oxygen flow and energy into the right hemisphere of brain which activates the parasympathetic nervous system (enable relaxation). Alternate nostril breathing helps both hemispheres of brain, which helps to calm thinking and be able to relax and rest much more easily.

Both pranayama breathing techniques are beneficial to the diabetic since reduction of stress hormones like adrenaline and cortisol help lower blood sugar levels. As high cortisol levels tend to promote over eating and accumulation of intra abdominal fat which contributes to insulin resistance. Depression can also lead to over-eating and aggravation of insulin resistance.

The Yoga asanas beneficial in Pittaj and Kaphaj Prameha (Type 2 DM)

The yoga asanas (postures) favors the loss of weight, increase the absorption of insulin and diminishes the need for oral hypoglycemic drugs.
Specific postures are beneficial to prameha (diabetes mellitus) due to their affect on internal organs and proper digestion of food (developing agni).

Some of the yoga asanas effective in the diabetes are mentioned below. These asanas should be learned with proper guidance before putting into practice.

1. Vajrasana (diamond pose): Preparatory pose for many other asanas and a posture for practicing pranayama and meditation.
2. Mandukasana (frog pose): It helps to stimulate the pancreas to secrete more natural insulin in the patients of inadequate insulin secretion defects.
3. Sputa Vajrasana (fixed firm pose): The asana helps in the working of digestive system and boosts sensual energy in whole body.
4. Sethu Bandhasana to Viprit karni (bridge and leg up the wall pose): This posture or asana helps to eliminate the feeling of exhaustion and fatigue, in other words it counter-effects the peripheral neuropathy and other complications rose due to prameha.
5. Sarvanga asana (shoulder stand pose): This asana helps to improve the blood circulation in the human body; the better circulation of blood carries the adequate amount of insulin to act upon the blood glucose level at the skeletal muscle sites to utilize the blood glucose.
6. Purna shalabhasana (face to floor leg raise): This asana helps to increase the jatharagni (gastric fire) which improves digestion of highly fatty and carbohydrate food.
7. Triyaka bhujangasana (twisting cobra pose): The asana is helpful to clear the bowel and constipation, which is common in the diabetic patients.
8. Dhanurasana (bow pose): This asana helps in increasing the energy of body and counteracts the depression in diabetic patients.
9. Udharmukh swan asana (upward facing dog pose): This asana help to increase the digestion by increasing the blood circulation to mesenteries of stomach and alimentary canal. It also helps in proper digestion of fat, carbohydrate rich food.
10. Paschimottanasana (seated forward bend): This helps for massaging of internal organs, especially the organs of digestive system which improves the digestion.

These yoga asanas have both direct and indirect influence on pancreatic secretion by rejuvenation of pancreatic cells, through alternate abdominal contractions and relaxation during the asanas (yogic postures which produce relaxation).

The best outcome is achieved by a diabetic patient when meditation is combined with yoga asanas. The objective of meditation is to control the attention. It takes all the pressure from this world, which for most diabetics centered on their problems and worries about how the disease will affect in the future. Meditation helps out of this problem by allowing harness the full power of mind, body and soul.

The physical benefits of Yoga in Prameha patient (Diabetics)

1. Enhanced blood circulation.
2. Enhanced energy, strength and vitality.
3. Enhanced flexibility and coordination of muscles in diabetic neuropathy.
4. Increased efficacy of digestive system and a balanced appetite and metabolism.
5. Enhanced ability to manage stress.
6. Enhanced mental strength.
7. Enhanced mental alertness.

The diet used in diabetic patients should decrease the kapha, pitta and vata doshas by skillfully tailoring various tastes, associates energetic and gunas (qualities) to the patient's diet.[12]

DISCUSSION

Yoga asanas (postures) are ideally suited for both types of Prameha (Diabetes Mellitus). In Insulin Dependent Diabetes Mellitus, asanas help to prevent an increase in insulin required over the years. In NIDDM, asanas help to normalize blood sugar due to the high intensity workout. Yogic exercises can either be of high or low intensity, depending on the clinical condition. Young active diabetics can be made to practice very intense asanas and exercises in a dynamic manner, which will increase the cellular activity of the muscle, which require more sugar. The advanced asanas require a lot of energy and this helps to normalize blood sugar level, but if a diabetic patient is obese, asana practice is difficult therefore one should reduce weight by any other means and then switch to yoga practice. The internal organs are directly affected by geometric shapes or massage of asanas therefore elder people can also practice yoga comfortably without any complications. The force of aterial flow is also increased and directed to any organ which is of immense use in diabetic state. In standing posture the skeletal muscles increase their uptake of sugar which normalizes the blood glucose level. Capillary changes are also easily prevented by yoga due to the action on vessel walls. Yoga is microcellular in its action. When the internal organs massaged, sensitivity to insulin and sugar uptake by muscles is enhanced. Asanas also pressurize the pancreas in an effort to improve the secretary status. The massage of pancreas by forward bending and twisting helps to release more insulin with respect to food intake. Backward bending being very strenuous, help to reduce blood glucose. It improves blood supply to all abdominal and pelvic organs. Forward bending increases the gastric fire and help healthy digestion of food. This prevents fluctuations of glucose levels in diabetic patient. The excess sugar burned immediately by stimulation of gastric fire. Therefore yoga therapy is also very useful for all complications of Prameha (Diabetes Mellitus).

CONCLUSION

Yoga therapy stimulates auto healing systems of body to increase the insulin sensitivity and also removes the complications of the prameha. It is metabolic disease in which primary problem is the defective utilization of sugar by the body. The sufficient insulin is produced by pancreas with the massage by yoga asanas which controls the body's ability to store and utilize sugar. Pranayama definitely increases the natural immunity of body and vital capacity of lungs which also removes stress while improving oxygen perfusion to tissues. Therefore specific yoga asanas and pranayama should be done daily. Yoga life style is very useful for all complication of prameha. The aerobic exercises like swimming, cycling, running, rowing, jumping rope should also performed to control the endocrine hormone secretions like insulin which controls diabetes mellitus.

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