

Health Crisis in India: Diabetes Awareness, Prevention and Treatments

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Diabetes is a worldwide epidemic, affecting over 350 million adults over the age of 18. This translates to roughly 5% of the worldwide adult population. India has topped over 65 million people diagnosed with the disease, higher than any other country. The World Health Organization (WHO) estimates that China's population includes 20 million and the United States' includes 17.7 million people diagnosed with diabetes (Kaveeshwar & Cornwall, 2014). The International Diabetes Federation estimates that by 2035 the number of adults diagnosed with the disease in India will hover around 110 million, accounting for 90% of all diabetes cases in the Southeast Asia region. (Regional Overviews, 2013) Considered an inflammatory disease, diabetes can be manageable, particularly in countries with universal access to healthcare. In India, people have less access to medical care and thus, less access to the simple medications required to manage the diseases and its collateral diseases, such as high blood pressure and cholesterol. Therefore, the risk of complications from these diseases increases exponentially. There are both acute and long-term complications of diabetes including blindness, cardiovascular diseases, kidney failure, limb amputation, coma, and eventually death. This paper will explore basic diabetes information, modern Indian attitudes toward awareness, prevention, management, and treatment modalities for diabetes, and their effectiveness including biomedicine, Ayurveda, yoga, meditation, and Tibetan medicine.

Attitudes, Perceptions, and Realities

The largest predisposition to Type II diabetes worldwide is obesity. In India, however, diabetes is much different than in other parts of the world. Type I diabetes, or childhood diabetes, is relatively rare, and only 1/3 of those diagnosed with Type II, or adult onset, are overweight or obese. The incidence of diabetes is occurring earlier in life, in middle and upper

income children and adults in India, and also amongst the impoverished. The children of higher income families are leaning toward more processed, “fast” foods, while children from lower income families, who struggle with food insecurity and malnutrition, tend to have a higher incidence of Type II diabetes as a result of pancreatic damage and early metabolic changes. (Taksande, Taksande, Kumar, & Vilhekar, 2008) Sedentary lifestyle is also contributes to diabetes.

The largest barrier to appropriate healthcare coverage in India runs along socio-economic lines, with less educated women and their children having the lowest percentage of healthcare availability. Around 70% of the population of India lives in rural communities. They live on less than \$2 a day and do not have access to a local doctor, hospital, or pharmacy within a 20 kilometers radius (Sucre Blue, 2013). With little daily allowances, finding money for additional expenses like medication is out of reach for most diabetic Indians.

Despite the large population that is currently living with diabetes in India, disease and treatment awareness hovers as low as 21% in some rural areas of the country (Singh, Milton, Nanaiah, Samuel, & Thomas, 2012). Those who are already diagnosed with the disease, however, do not have negative perceptions about the disease or the medications used in its management. They acknowledge that, with improved access to medications, they would have better control of their disease in general (Shrivastava, Shrivastava, & Ramasamy, 2013). With the lack of access to affordable care, the complications from uncontrollable diabetes are spiraling out of control in India. It is estimated that the cost of complications due to the diabetes epidemic in India are staggering, costing diabetic patients anywhere six to seven times what a non-diabetic person would pay for medical care. Low income diabetics in rural areas paid approximately 34% of their oncome for their care as opposed to 27% in urban areas (Singh, 2013).

First Line of Recommendations

Regardless of treatment modality, the first line recommendation made worldwide for diabetes, particularly Type II, is to maintain one's blood sugar level within as narrow of a range as possible by means of weight control and physical activity. Diabetics have too much glucose in their bloodstream as the result of either the pancreas not producing enough insulin or their bodies becoming insulin-resistant. Weight control for Type II diabetics has been found to lower glucose levels in the bloodstream and, in some cases, helps to reverse the disease. Aside from managing food intake, physical activity is one of the best ways for patients to lose weight. Even without weight loss, regular exercise can lower glucose levels in the blood (Ross, 2003). There are three types of exercise: aerobic, strength training, and flexibility training. These are all fundamental for diabetics to achieve their weight loss goals (Leontis, 2014). One reason many diabetics have a difficult time with weight loss is insulin resistance. Insulin resistance occurs when muscle, fat, and liver cells do not properly use insulin, causing the pancreas to create more (National Diabetes Information Clearinghouse, 2014). Even though this disease can have devastating consequences, there are standard biomedical treatments that, when used correctly, are very useful if exercise and weight control have not been effective.

Standard Biomedical Care

The main standard of biomedical care for diabetes worldwide, including India, is medication, such as metformin or injectable insulin. Both treatments are relatively low-cost and very effective. Metformin is used as a first line medication before insulin and is still considered one of the most useful tools for the management of the disease. Its roots go back to European traditional folk medicine, and it is synthesized from *Galega officinalis*, also known as French Lilac or Goat's Rue (Micozzi, 2012). When metformin is no longer able to control symptoms of

the disease, insulin is introduced. Insulin was first discovered in 1921 and was considered a major breakthrough therapy for anyone with Type I diabetes, who rarely survived more than a few years without it. While India has been able to produce insulin that is low-cost, there are a number of factors at play that make this effective form of treatment less accessible. Less than 10% of the Indian population has health insurance, so most patients are paying out of pocket to cover their expenses. With the burgeoning diabetes health crisis, insulin costs have soared. In addition, the cost of syringes, glucose meters, and glucose strips make the management of this disease very difficult. One organization, the Bangalore-based Sucre Blue, has hired diabetic women from villages to act as community health workers by going door-to-door to screen, diagnose, and provide diabetics with affordable low-cost treatment options. This service helps improve patient compliance and also creates sustainable income for women (Sucre Blue, 2013). Unfortunately, as a local community service, this only provides healthcare access to the villages around Bangalore.

Alternative Treatment Modalities

While it is undisputed that metformin and insulin are two of the most effective treatments available, there are a number of traditional practices that originated in India that can be used in complementary care of the disease. Interestingly, the diagnosis of diabetes is considered one of “Western” origin. In many traditional medical systems, the symptoms of diabetes are described as different imbalances within the body, rather than a singular disease, and are treated as such.

Ayurveda

As more diabetics and pre-diabetics look for prevention and disease management techniques outside of biomedicine, Ayurveda is one that is widely practiced in India. Ayurveda, once the traditional form of medicine practiced in India, is now considered an alternative

medicine. Medical knowledge of Ayurveda was handed down from generation to generation for nearly 5000 years. It is one of the oldest forms of medicine still practiced today. Ayurveda is the “Science of Life” and is a combination of two Sanskrit words: “ayu,” meaning life, and “veda,” meaning knowledge. There are two objectives to Ayurveda: first, to promote perfect health and long life and second, to eliminate dysfunction and disease from the body.

Ayurveda is both holistic and preventative. It relies heavily on the concept of lifestyle management which includes physical, mental, and spiritual well-being. Ayurvedic treatments are introduced when there is a need to promote balance, prevent disease, and, in some cases, cure disease. Ayurveda uses Doshas to describe the essential factors of our bodies that comprise our physical structures and functions. There are five great elements, or Bhutas, that are fundamental to the Doshas: 1) Akasha (space), 2) Vayu (air), 3) Tejas (fire), 4) Jala (water), and 5) Prithivi (earth). The Doshas are a combination of two of these five elements. There are three primary Doshas: Vata, which concerns itself with movement; Pitta, which is the embodiment of metabolism, heat, and energy; and finally, Kapha, which is fundamental to physical structure and fluid balance in the body. The Doshas are first described in a primary sense – or what your basic constitution is – and then described as an excess, determining various treatments and lifestyle choices including diet, exercise, and spirituality.

Diabetes was first described in ancient Vedic texts by doctor Charaka nearly 3,000 years ago as “Madhumema,” a Sanskrit word meaning “sweet urine disease” (Patel, 2012). In Ayurveda, diabetes is frequently seen as an excess of the Kapha Dosha. There are four therapies used in Ayurveda to balance the Doshas, depending on the specific diagnosis. The Ayurvedic doctor may prescribe any combination of these therapies depending on the patient’s personal diagnosis including: 1) Panchakarma, a fivefold body purification treatment; 2) Alleviation

therapy, involving specific oils and condiments frequently used in tandem with Panchakarma; 3) Herbal medicines; and 4) the “Six Tastes,” which are used in cooking and food preparation (Micozzi, 2011, p. 460). Ayurvedic doctors also use pulse, tongue, eye, and nail exams to help determine the treatment course. Where Panchakarma treatments might be prescribed for a Type II diabetic, they should be avoided by a Type I diabetic due to how the Ayurvedic system views symptoms and imbalance in the body.

There are a number of herbal medications that have been studied extensively in Ayurveda to help balance blood sugar, including *lochnera roscea*, also known as French lilac and goat’s rue; *alstonia scholaris*, known as Indian devil tree; *emblica officinalis*, known as Indian gooseberry; and *Azadirachta indica*, also known as Neem (Bhargava, 2015). In the Ayurvedic studies published in English, much of the actual data has been inconclusive due to testing processes; however, there were a number of successes in lowering overall blood glucose levels. Until a standardized, double-blind study is performed with these Ayurvedic remedies, much of the data available in English will remain inconclusive yet compelling (Sridharan, Mohan, Ramaratnam, & Panneerselvam, 2011).

Yoga and Meditation

Yoga, known as the sister science to Ayurveda, is believed to have originated in India and has been practiced for over 5,000 years. Its popularity has spread worldwide. Although the exact origins are unclear, we do know that yoga is the Sanskrit word for “yuj,” which is frequently interpreted as “union” or “to join.” This union is described as the connection between the mind-body-spirit. Deeply rooted in ancient texts known as the Vedas, yoga goes beyond the common Western misconception that it is solely for physical fitness. Yoga is the knowledge of humanity, God, the universe, and the relationship of the three (Micozzi, 2011, p. 483).

Depending on the school, yoga has various disciplines from deep meditative to very physically active styles, but, in all forms of yoga, there is a core disciplined spirituality that is fundamental to the practice.

Yogic philosophy asserts that there are two elements that comprise the universe, purusha and prakrti. Purusha is the eternal, indestructible, pervasive element that pertains to the souls of all living beings. Prakrti is the animator, a primal motivating force in the universe that stimulates purusha. (Micozzi, 2011, p. 484) In essence, purusha is the internal world while prakrti is the external. It is believed that when the human soul is stagnant, it is focused solely on its prakrti, but, when the soul is liberated, it identifies with its purusha. Ultimately, the role of yoga is to lead the soul toward a place of expanded consciousness that places an emphasis on living and functioning in the material world with a sense of consciousness toward nature and the spiritual journeys of others.

Yoga is frequently depicted as a tree with eight limbs: Pranayama (breathing), Asana (postures), Yama (restraint), Niyama (healthy observances), Pratyahara (sensory withdrawal), Dharana (concentration), Dhyana (meditation), and Samadhi (higher consciousness). Yoga is a complex science that has evolved over thousands of years and has as much variation as it does history. It is utilized as an active sport for health, a relaxation tool for the stressed, and as a spiritual model for those seeking enlightenment. Meditation is seen as the vehicle used to travel on the spiritual journey (Micozzi, 2011, p. 489). There are various types of yoga, each involving some form of meditation. Popular types practiced around the world include: Kundalini, Hatha, Swara, Kriya, Ashtanga, Manta, Bhakti, and Jnana – there are literally thousands of different variants.

Meditation is a discipline in which one trains the mind to move to a different level of consciousness for a myriad of reasons, such as developing life force (prana), compassion, patience, forgiveness, love, mental clarity, and concentration. Ultimately, it promotes an internal method of controlling the mind as a means to elevate one to a higher level of mental well-being. There have been hundreds of studies published on the effects of meditation on the human body, and, again, there is compelling evidence that it is a dramatic complementary tool for disease management.

These extensive studies have looked at both yoga and meditation for a myriad of health issues, diabetes included. Scientists are not exactly sure how yoga works, but the theory is that it releases endorphins, natural pain killers, in the body. It has been shown to lower blood pressure and heart rate, increase muscle relaxation, and increase lung capacity. In diabetes, regular practice has been shown to help lower overall basal and post-prandial blood glucose levels and prevent and retard the progression of cardiovascular and metabolic disorders associated with the disease (Sarvottam & Yadav, 2014). A compelling study conducted over the course of three months identified significant positive changes in participants' body mass index (BMI), waist-hip ratio, blood pressure, fasting blood sugar, Glycosylated hemoglobin (HbA1c), and lipid profile, giving strong recommendation for yoga and meditation as a useful adjunct to conventional therapy (Jain, Agrawal, Gahlot, Khatri, & Mathur, 2009).

Tibetan Medicine

Tibetan medicine is a traditional system of healing that has influences from China, Persia, India, and Greece. It includes concepts of the body similar to Ayurveda, and Traditional Chinese Medicine and combines the psychological, philosophical, and spiritual nature of Buddhism into a unique healing system. Tibetan medicine (gSo-BA Rig-PA), the science of healing, has a lineage

that goes back many centuries and describes the elements of earth, wind, fire, water, and space as essential to all phenomenon that occur in creation and destruction. Its fundamental purpose is to remind practitioners that the fundamental goal of healing traditions is to provide compassionate care to suffering beings (Ergil, 2011, p. 4).

The fundamental scripture to the practice of Tibetan medicine is known as the Four Tantras. The First Tantra is the "Root Tantra" and provides an explanation of all diseases. The Second Tantra is the "Explanatory Tantra," and it describes human anatomy and physiology along with the process of birth and death. The Third Tantra is the "Oral Transmissions Tantra." It speaks about the cause, nature, classification, and treatment of diseases. The Fourth Tantra is the "Last Tantra," and it describes 18 methods of diagnosis, pharmacology, and physical treatments.

Three principle systems, or Humors, are viewed as creating and sustaining all of the body's functions. These three Humors are Wind, Bile, and Phlegm, and, when out of balance, the humors can cause disease. Wind disorders can be solitary or combined with one or more systems. Typical symptoms of a wind disorder involve erratic and diffuse pain, lower back and hip pain, dry skin, abdominal distention, constipation, diarrhea, anxiety, anorexia, depression, mood swings, insomnia, psychosomatic disorders, irregular blood pressure, and metastasis of tumors. Bile disorders include symptoms like liver and gallbladder function, thermoregulation, metabolism, vision, and blood production. They can also include conditions such as anger, hypertension, acid stomach, and fast-growing tumors. Finally, Phlegm disorders are associated with the digestion of food, fluid regulation, and overall sensory function. Phlegm disorders manifest themselves as hypersensitivity to cold, a sensation of physical or mental heaviness,

kidney disorders, hypotension, slow metabolism, weakness, diarrhea, the development of soft cysts, and slow tumor growth progression.

Diabetes would ultimately be viewed as an imbalance of each of the three systems (Rinpoche, 2005). Western diagnoses of diseases such as diabetes are viewed differently in Tibetan Medicine as concepts of disease origin, and they apply a different protocol for their treatment. Tibetan medicine employs a unique, individualistic approach to diagnosis based on complex arrangements of illnesses and their root causes. Similar to Ayurveda, Tibetan medicine describes three energies that comprise a person's "constitution." These three energies include: 1) Loong, movement energy; 2) Tripa (pronounced teepa), hot energy; and 3) Baekan (pronounced bacon), cold energy. Overall, your constitution does not change over your life, but your energies may increase and decrease based on your thoughts, lifestyle choices, and situation.

Further diagnostics can include pulse and urinalysis. Treatments can range from medicines made of natural components such as herbs and minerals, behavior and diet modification, and other mechanical therapies such as massage, Tibetan acupuncture, herbal baths, and moxabustion. Moxabustion involves ground up herbs rolled into a cigar shape and burned on a patient's skin to draw out toxins and disease. One study concluded that specific herbs used in Tibetan medicine caused a significant improvement in fasting blood sugar levels in patients with type II diabetes compared to patients treated only with diet and exercise (Namdul, Sood, Ramakrishnan, Pandey, & Moorthy, 2001). Promising studies such as this provide the basis to consider Tibetan medicine as yet another complementary treatment for diabetics.

Conclusion and Reflection

In conclusion, diabetes is a massive health crisis in India and worldwide. With better awareness, education, prevention, and treatment options, it is a disease that can be manageable

and, in the case of some Type II diabetics, reversible. The traditional therapies of Ayurveda, yoga, meditation, and Tibetan medicine have been studied extensively, and there is compelling evidence to suggest that each is a useful disease management tool for diabetics worldwide.

Diabetes is an illness that has particular significance to me as both my parents and both of my grandmothers have struggled with Type II. Even one of my dogs is diabetic! While I have personally witnessed the devastating consequences of this disease, if properly diagnosed and treated early, it is eminently manageable and, in some cases, reversible. While in India, I met a number of people with whom I made wonderful connections. In our communications, I asked them what they felt was one of the worst medical issues they faced in their country, and all of them said diabetes along with some variation of the complications from the disease and access to affordable medication. It was these conversations that crystalized that, as humans, we all strive for wellness and we frequently share the same devastating kinds of disease. We all just want to be healthy. How do we get there?

When I began this research, I knew a lot about diabetes already because of my familial background, but it really struck a chord with me how devastating this epidemic is worldwide. Frankly, I bit off more than I could chew with this topic as there was a vast amount of data through which to sift. The struggle that India has with affordable health care options, for the majority of their population due to poverty, is devastating. The depth of disease management is also very rich, and better health outcomes could be attained through a blend of therapies including biomedicine, Ayurvedic lifestyle, yoga and meditation, or Tibetan medicine. Ultimately, until disease awareness and accessible healthcare are commonplace, this is an epidemic that is a potentially staggering global public health crisis.

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