

The Diabetes & Anemia Project

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Wayanad, Kerala, India
August–September 2014

Background

Finger pricks with every meal. Multiple insulin injections daily. Heavy dietary restrictions and down-sized portions. Involuntary weight loss. Sudden weight *gain*. Extreme fatigue. Fear of heart attack, stroke.

What does it mean to be diabetic?

As a child growing up in India, Aparna witnessed the demands diabetes exacted on her grandfather. Though neither one of us knows what it feels like to be a diabetic, we *do* know that the diabetic lifestyle is one of intensive, lifelong management. We also know that, at present, India is afflicted with 67 million diabetes patients, with another 30 million in the pre-diabetes group.¹ The World Health Organization projects that diabetes will rise to the seventh leading cause of death by 2030², and India, accommodating the largest number of patients in the world, will be at greatest risk in the escalating epidemic.

More recently, a shift in diabetes target populations from middle-to-upper societal sects to lower-income brackets in rural areas³ brings diabetes to the forefront of India's concerns. Compounded by the staggering disparity in healthcare provisions between India's urban and rural populations, this transition becomes especially worrisome for the tribes of the Wayanad district in Kerala, India, which are ill-equipped to manage the symptoms of diabetes and their complications—neuropathy, eye problems leading to vision loss, decreased renal function, heart failure.⁴ Furthermore, anemia is a common accompaniment to diabetes, affecting nearly 25% of diabetics⁵; though it can be easily treated, it often goes unrecognized because symptoms such as weakness and exhaustion overlap with those observed in diabetes.

Since 1972, Sewa (*say-wah*) International, a non-profit organization, has supported the Swami Vivekananda Medical Mission (SVMM) in its service to the Wayanad tribal population. Having begun as a small medical dispensary, SVMM today has grown into a modern hospital facility with six mobile clinics that offer basic health services as well as specialized foci in neurology, ophthalmology, sickle-cell disease, and tuberculosis, among others.⁶ Though it currently lacks diabetes and anemia treatment centers, its keen interest in developing them coincides with our desire to combat these diseases. We know that we can help diminish the gap in healthcare availability by targeting the spread of diabetes and anemia among the Wayanad tribes.

We want to promote peace in this underserved region by spreading awareness for the symptoms of diabetes and anemia, which we in turn hope will improve the accessibility of healthcare for the Wayanad tribes.

Project Proposal

This summer, we will conduct diabetes and anemia screenings for the Wayanad tribes. Our target population will consist of men and women ages 40 and above, the age range in which SVMM anticipates the greatest number of individuals afflicted with pre-diabetes or diabetes, and consequent complications with anemia. With 75 patients screened daily, we approximate a total sample population of 500 patients by the end of September. The data that we collect will offer an initial glimpse into the rates of prevalence of both diseases for the tribal population as a whole as well as among different age groups, sexes, and tribes. Further details are outlined below.

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Timeline & Methods

Week 1: Arrive in Wayanad. Meet SVMM staff and coordinators, get acquainted with hospital and mobile clinic schedules. Purchase and set up equipment. Review screening protocols and data collection methods.

Weeks 2-6: Administer diabetes and anemia screening tests at the hospital in the morning, travel out to mobile camps in the afternoons (six mobile clinics total, rotate one per day). Repeat daily, Monday–Saturday. Sunday, compile and analyze data.

Methods: A glucometer will be used to measure blood glucose level; a blood sample obtained from the fingertip will be applied to a glucometer test strip inserted in the device, which will provide a measure of blood glucose concentration. Results will be categorized as normal, pre-diabetic, and diabetic for readings of <140mg/dL, between 140–200mg/dL, and >200mg/dL, respectively.⁷ Hemoglobin (Hb) concentration will be determined using a similar procedure with a hemoglobinometer and its respective test strip. The normal Hb range is defined as 13.5–17.5g/dL for men, and 12.0–15.5g/dL for women; sub-normal levels indicate anemia.⁸

Two test strips will be utilized per patient—one for each test type. Screening will focus on men and women ages 40 and above, and the results will be sorted into one of four age groups: 40–49, 50–59, 60–69, and 70+. Recruiting ~75 patient samples per day, we estimate a sum of 500 patient results by the end of the six-week period.

Data will be collected on an Excel document organized according to patient name, tribe, sex, and age, followed by blood glucose level, Hb concentration, and classification as either non-diabetic, pre-diabetic, or diabetic, and either healthy or anemic. The data will then be compiled and analyzed to determine what fraction of the tested tribal population is non-diabetic, pre-diabetic, and diabetic, and to compare rates of prevalence in pre-diabetic and diabetic groups among men and women, within and between different age groups, as well as within and between different tribes. We will conduct the same analysis for the Hb concentration measurements to determine the number of healthy versus anemic individuals within our sample population.

Expected Outcomes & Future Direction

The screenings that we conduct will provide preliminary data for evaluating the prevalence of diabetes and anemia among the tribes in Wayanad. Because treatment options are yet unavailable, we plan to distribute informational pamphlets among the tribes in the short-term that detail the risks and symptoms associated with pre-diabetes, diabetes, and anemia, as well as offer dietary and nutrition tips to help prevent and control the diseases. SVMM will continue our efforts into the future with the long-term goal of developing permanent specialized diabetes and anemia facilities in which to treat patients.

Working alongside SVMM and interacting with the members of the Wayanad tribal population will undoubtedly prove to be a memorable learning experience. Certainly, as pre-med students, we anticipate that working with the tribes will reaffirm our interest in medicine—and offer a first-hand glimpse into the practice of rural medicine—but we also hope that this opportunity will broaden our awareness and appreciation for different cultures and customs, and establish the foundation for a lasting relationship between SVMM, the Wayanad community, and ourselves.