

My perspective on the chronic disease epidemic in India

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The chronic disease epidemic as I am seeing it in my clinical setting is the large number of patients in the OPD who have been screened and detected to have diabetes, hypertension, dyslipidemia and obesity. Some of them are symptomatic and some asymptomatic. And the wards are filled with a range of complications of these, strokes, heart attacks, chronic kidney disease, severe infections with pyelonephritis, cellulitis and pneumonias. This is affecting all range of the socioeconomic condition.

Medicine deals with diseases as discrete, watertight categories. But we know that these conditions - altered glycemia, blood pressure, cholesterol and weight are closely overlapping profiles which occur together. They are a set of modernising conditions. What is this set of modernising conditions as they are affecting the human body?

Essentially all these conditions - glycemia, blood pressure, cholesterol and weight are themselves are not diseases (conditions which have invariably have symptoms, pathology). They are derangements of physiology which predict future complications. On the one hand, the modern trend of screening large samples of individuals in whole populations for chronic disease is creating epidemics (50% of adult population having prediabetes and 20% having diabetes, 20% having hypertension) - suggesting an overmedicalisation. On the other hand - many patients are falling ill with life threatening conditions which are expensive to treat. Thus, the epidemiological techniques of modern medicine are leading to overmedicalisation - stating that large proportion of the normal population is diseased. However, there is also a true epidemic of people falling sick and dying due to these changes in modern life. How do we understand this dichotomy?

The epidemiological way to think about these risk factors in chronic disease is at the level of individual causation of morbidity. This approach asks the question: what are the risk factors causing the disease in the individual - in relation to diabetes, dyslipidemia or heart attacks, and then designs ways to focus on modifications of these. But the other way to think about it is that the human being (as an evolutionary species, as a human anatomy, physiology and biochemistry) is adapting to rapidly urbanising conditions, consisting of changes in physical activity, diet, stress and social relations, developing new physiological norms to cope with these changes. What else could it mean if a large majority of a species had a disease which largely causes no symptoms and this disease was less important several decades before? These changes in glycemia, blood pressure, cholesterol and weight could be regarded as adaptations or maladaptations.

Modern medicine has only one way to deal with this epidemic, i.e. to medicalise it. To regard each of these abnormalities as diseases, which have a specific drug for treatment. So this drug based therapeutic drive of modern medicine, based on its own logic of treatment and the pharmaceutical companies' imperative to generate profits is governing our approach to deal with this chronic disease epidemic. But if these derangements in physiology (which we call diseases), reflect a change in the modern human condition (the way we live our lives) and our (the human) maladaptation to these, then how do we redefine our approach to deal with these maladaptations? The medical approach will always be a drug based therapeutic approach based on the individual - individualised risk factor modification, individual drug treatment and

entering the medical system (the regime of hospitals, laboratory, pharma with ceaseless drug ingestion and monitoring till the day one dies).

One is not saying here that the human species has to go back to the villages, to traditional life, to the forests, to growing one's own food and stitching one's own clothes. Given that urbanisation is going to take greater hold of us as the 100 mega cities take off and 50% of the population becomes urban, life in the rural areas will become increasingly unsustainable. What communitarian approach can we take- to deal with the pervasive changes in modern life?

How do we as a species- human beings living on this planet earth in the 21st century- understanding what we are doing to the environment and to other species, and to each other (inequality, social relations), and to ourselves (changes in the nature of human existence)- respond to the chronic disease epidemic? Approaches that can lead to more sustainable ways of living- not in terms of living longer, but giving value to each other and human life.

How will such a way of thinking lead to a restatement of the problem- disease definitions, the individual clinical approach, the public health perspective?

The advent of drug therapy was fundamental in defining individual risk categories for coronary artery disease, diabetes, hypertension and dyslipidemia. The discovery of hydrochlorothiazide, clinical trials and marketing of this drug by Merck Sharpe and Dohme were fundamental in defining the risk category of hypertension. The discovery of statins and sulfonyl ureas and marketing of these drugs had a similar parallel history and were again critical in defining hypercholesterolemia and diabetes mellitus Type II as disease categories.

Till the early 1950's epidemiology was focussed on study of infectious disease. In the two decades that followed with the recognition of the importance of cardiovascular deaths, and presidential heart attacks such as that of Eisenhower, there was governmental focus on the epidemiological investigation of chronic disease. The first large scale long term study of cardiovascular disease- the Framingham study—published in the early 1970s played a defining role in the conceptual framework of chronic vascular disease. It also defined the epidemiological method of investigation of chronic diseases and public health both in America and across the world. The Framingham study demonstrated the statistical association of diabetes, hypertension and hypercholesterolemia as risk factors for coronary artery disease. Randomised controlled trials of interventions such as hydrochlorothiazide for hypertension reduced heart attacks and deaths. The statistical association of risk factors with the occurrence of heart attacks and the efficacy of interventions such as aspirin, statins and antihypertensive in preventing heart attacks are together what sustains the logical framework of risk factors as causative agents and disease categories. Exactly how these risk factors lead to arteriosclerosis, heart attacks and strokes is not clear. Studies of tight diabetes control have not shown that it prevents heart attacks and strokes, although it may prevent diabetic retinopathy. The point being made here is that the edifice of chronic vascular disease is based on the epidemiological framework set in place by the Framingham study. The earlier German model of a primary health care approach to addressing the cardiovascular disease epidemic that was functional upto the 1970s, was quickly overturned by the impact of screening and drug based approach to treatment developed in America.

The origins of conceptual framework of cardiovascular disease has a local history in the United States, of the Framingham trial, the VA trial on hypertension, the efforts of MSD to promote Diuril as the first specific anti-hypertensive drug, the JNC guidelines. Does vascular disease behave differently in India? Is there another way of conceptualizing chronic vascular disease which is cognizant of the realities of the Indian scenario? It is necessary to critically examine the Framingham study and its impact on the conceptual framework of cardiovascular medicine. We also need to do a study of how hypertension, diabetes and hypercholesterolemia became disease categories with the aim of uncovering the assumptions regarding causation, treatment and the ecology of these disease categories themselves. We also need careful examination of epidemiological risk factor studies of vascular disease in India and how they fit the risk factor model developed in the west.

The studies of urban diabetes in Chennai and other urban centres across the country show an increasing prevalence of diabetes up to 18% and of prediabetes up to 50%. Longitudinal studies seem to suggest a gradually increasing epidemic. Based on these data, we usually assume that the entire population of the country is undergoing large scale developmental change in the form of urbanisation, lack of physical activity and calorie and fat rich diet. Is this actually true?

Our studies in Gudalur seem to suggest that the scale of diabetes mellitus Type II is of a much smaller scale compared to the urban epidemic. The adult prevalence of diabetes in three tribes, Panniyas, Bettakurumbas and Kattunayakans in Gudalur valley is < 1% and one tribe the Mullukurumbas who are more modernised is around 3%. The Gudalur tribes are exposed to major developmental stress, change from a varied food basket to a carbohydrate diet constituted by PDS rice, displacement from the forest and decreased access to forest resources and increasing use of motorised transport. What is protecting these tribes from diabetes? The three tribes with low prevalence of diabetes have high rates of undernutrition, with >40% of adult population with BMI < 18.5. Is it undernutrition, or high physical activity, or access to some fruits, vegetables from the land that is protecting them? These tribes are clearly not displaying the predisposition to diabetes that has been demonstrated in Pima Indians, aboriginal communities in United States, Canada, Australia and Pacific Islands. However all the tribes of Gudalur have rates of hypertension above 10%. Although diabetes prevalence is low, community mortality statistics over 1 year showed that of 181 adult deaths (>15 years), vascular causes of death were the most common 22.1% (14.9 % due to strokes and 7.2 % deaths due to heart attacks) followed by suicides 11.5%. Therefore although the diabetes is of low prevalence, deaths were predominantly cardiovascular though due to different epidemiological risk factor profile dominated by hypertension.

Is urban and rural India, one homogenous matrix with high rates of diabetes, hypertension and dyslipidemia and increased mortality due to heart attacks and strokes? The Gudalur epidemiological study seems to suggest that the epidemiology of vascular disease is different. Anecdotal data from Bissam Cuttack and Sittilingi seem to suggest that the communities in these locations have low rates of diabetes. More careful local epidemiological studies are required to trace the risk factor profiles and rate of myocardial infarctions and strokes.

What are the implications for prevention? Our model of cardiovascular medicine is based on pharmacological approach to prevention based on therapy of the individual. When working

with traditional local communities, is there a more democratic model of prevention that addresses the underlying developmental changes that are precipitating the epidemic?
