Cardio-Metabolic Burden of Native Asian Indian -
India the Global Capital

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“Every fifth Indian and every fifth Diabetic will be an Indian.”

The spreading cardiac and diabetes epidemic is a major health threat for India and threatens to bankrupt our nation. The unprecedented increase in diabetes and cardiovascular disease (CVD) prevalence is evident from the report of World Health Organization (WHO), which shows that India tops the world with the largest number of diabetic subjects. According to recent WHO estimates presently India has 32 million diabetic subjects, and this is projected to increase to 100 million i.e. rise by 250% by the year 2035. This means by that time India will contribute to more than one-fifth (20%) of the total diabetic population in the world. Further support for the rising prevalence comes from the recent studies obtained from the several major studies from India. There is a growing trend towards Metabolic syndrome. This syndrome is a deadly combination of Hypertension, Diabetes, Heart Disease and Dyslipidemia due to abdominal obesity. The cause of this is both bad genes and bad environment.

Similar data is seen in south India by Mohan et al in his Chennai Urban Population Study (CUPS) and Chennai Urban Rural Epidemiology Study (CURES) of the Madras Diabetes Research Foundation and Ramchandran et al from the WHO Collaborating Diabetes Research Centre in Chennai. In the CUPS study, 12% of individuals above the age of 20 years in Chennai were found to be diabetic in the year 1997. In the more recent CURES study, conducted on 26,001 individuals showed that 16% now have diabetes in Chennai. This is in sharp contrast to the 2% prevalence of diabetes reported by the Indian Council of Medical Research in the 1970s.

We are blessed with ‘bad’ genes. Our ancestors had genes which converted food to fat as we need them to store it as fuel during famines. Due to modern lifestyle now we do not have famines, no physical activity and bad diet. Therefore all what we eat, due to our ‘bad’ genes we convert it into ‘abdominal’ fat which leads to killer heart diseases. This ‘abdominal’ fat is the sole curse seen in urban, migrant and migrating Indians within and outside India. Our studies from urban Mumbai Maharashtrians and Gujrathies have shown that they have ‘genetic’ predisposition to diabetes. If both parents are diabetic then the chances are 90%, if one parent then 70% and relative with diabetes then the chances are 40%.

Dr. Mohan’s comparative studies on migrant Indians and Europeans conducted in U.K. in the 1980’s showed, that 10% of Asian Indian diabetics in the U.K. had both parents diabetic, compared to only 1% of European diabetics suggesting that the inheritance is stronger among Indians. The CUPS study also showed that nearly 60% of the offspring of two diabetic parents had either diabetes or pre-diabetes in Chennai. Though inheritance of diabetes is common in all ethnic population, such a high degree of genetic transmission has not been reported in Europeans. Though several genes have been identified to cause diabetes in western world, not much is known in India, hence we are hotly in pursuit of genes contributing to diabetes in India. However, genetic factors alone cannot fully explain such a rapid rise in prevalence of diabetes in India, as the genes have obviously not changed in this population during the last 30 years. This points to the role of rapid change in the environment.

Obesity can be of two types, ‘generalized’ and ‘abdominal’ obesity – accumulation of fat in the abdomen. Insulin resistance is considered to be interrelated with obesity and both can predispose an individual to diabetes. Our studies on migrant Indians showed that Indians have higher degree of insulin resistance compared to Europeans/Americans. Studies on migrant Indians have shown that although Indians are leaner than Caucasians, they tend to have increased abdominal obesity. Indians also tend to have more fat deposition in the abdomen, which leads to diabetes.

The rich are getting richer and poor poorer; as the gulf widens; the ‘neo rich’ class is the most vulnerable. The ‘neo rich’ Mumbaikar is the most vulnerable to metabolic syndrome and more than 63% from our study were in this social class. Presently 35% of the India is urbanized in contrast to 15% in 1950’s. Urbanization has led to rapid changes in lifestyle, with more white-collar jobs leading to decreased physical activity and affluence associated with consumption of fast foods rich in fat, sugar and calories. This epidemiological transition has lead to a paradigm shift in the health patterns in the country, from communicable disease to
non-communicable diseases such as diabetes. This is again supported by the data from the CUPS study where 20% of higher socio-economic group had diabetes against 7% in the lower socio-economic group. Further support comes from the CURES study, which showed that as the income increases the prevalence of obesity, abdominal obesity and diabetes increased sharply. This study also revealed that as obesity, particularly abdominal obesity increased, the prevalence of diabetes soared. Both these studies showed that only 5% of the Chennai residents exercised regularly. Sedentary lifestyle, one of the contributory factors for diabetes increased the risk for diabetes three-folds. Furthermore, family history of diabetes, lack of physical activity and obesity showed a cumulative effect in causing diabetes in most studies.

Thus, although genetic susceptibility plays an important role in the occurrence of Type 2 diabetes, the role of lifestyle factors are equally if not of more importance. In fact, this forms the key for prevention strategies. Thus to tackle diabetes on a war footing, it must be a part of an integrated program that addresses lifestyle-related factors, like physical activity and dietary modifications favoring weight reduction, in addition to stress reduction. Such a programme has now been taken up by the Indian Council of Medical Research (ICMR) as part of the National Diabetes Control Programme under the Government of India.

Diabetes complications account for 60% of diabetes-related health care costs (direct costs) and almost 80-90% of indirect costs.\(^2\) For example, in 1986 the total cost of type 2 diabetes in the US was estimated at 20 billion dollars but it had increased to over a 100 billion US dollars in the mid 1990’s, for diabetes-related health care problems.\(^3,4\) This increase of over 5 times in a decade is astronomical, and amounts to a little lower than one third of India’s GDP. Recent data suggests a further increase to 132 billion USD. Other studies on direct costs of type 2 diabetes have been carried out in Argentina, France and Denmark. The direct cost per patient per year for type 2 diabetes in Argentina was 330 US dollars, in France the cost was 675 US dollars and Denmark the cost was 3535 US dollars.

The per capita expenditure on health care in India is only 6.4% of the average world spending, while India accounts for 23.5% of the world’s disability adjusted life-years lost due to diabetes (DALYs).\(^5\) Due to scant resources and burgeoning costs, health care planners and providers are being forced to cut resources worldwide. Recently some studies have been published on the costs and sociological factors that influence it.

Persons with diabetes use higher health care resources. The excess cost is related to higher cost of treating late diabetic complications and the economic loss due to lost man-days or lost economic opportunity. To prevent diabetes complications, it is crucial that proper monitoring be carried out, first to assess response to treatment and secondly to detect any complications. In the given socio-economic situation in India, the lack of proper health care infrastructure and support for chronic illnesses; the rampant ignorance and absence of clear cut, even barely minimum, guidelines on protocols for care and monitoring, at the primary level means that diabetes care at this level is poor and the approach to the illness is ad-hoc. When resources are scant, and the option is to choose between monitoring and treating it is quite understandable that monitoring is neglected and does not receive the attention it deserves.

The result of DiabCare-Asia India study done in 26 tertiary care centres indicates that self-monitoring is poor. Approximately half the patients had poor control (HbA\(\text{c}>2\) % points above upper limit of normal and FBG>139mg/dl). Mean HbA\(\text{c}\) (central laboratory) was 8.9 ± 2.1% and FBG 150 ± 59 mg/dl. Over 54% patients had severe late complications, apart from a high frequency of associated hyperlipidemia; hypertension and renal function abnormalities. Mean HbA1c level and frequency of complications was higher in patients with longer diabetes duration. The rate and frequency of self or lab based blood glucose monitoring in India was one of the lowest amongst in the countries participating in the DiabCare Asia study and HbA1c was amongst the highest.

Fast foods kill fast. Defective eating is central to all disorders. Our modern diet, oils and fast food and cola culture is killing us. The better oils are "Rice Bran Oil, Canola, Soyabean, Olive" etc and not Safflower or Sunflower, less oil, fat and no frying is the key. To ‘by-pass’ ‘by-pass’ the best option is to ‘Eat Less and Walk More’.

In the current issue, Ashavaid et al tries to assess health status of Urban Mumbai from a health check up program of a tertiary care hospital.\(^6\) The prevalence of 22.5% hypertension, 14.2% diabetes and 3.9% of CAD is only the tip of the iceberg. The real hidden culprit is the Dyslipidemic Indian profile abnormal in 59%. Obviously it is central to the case of metabolic syndrome seen in native Asian Indians. The clouds of metabolic syndrome are now hover around every urban Indian city. Our ongoing Western Indian Diabetes Survey (WIDS) study form Wstern India of 10 cities (Mumbai, Thane, Pune, Nasik, New Mumbai, Raigad, Surat, Vapi, Ahmedabad, Baroda) shows that every fifth Mumbaikar will have diabetes.

There is a growing need to standardize normal values for native Asian Indian as per International Federation of Clinical Chemistry (IFCC) guidelines. Infact every accredited Indian lab must have reference value for our population. Current attempt by Ashavaid et al is one of the first attempts to have normative Indian reference values. The real culprit emerging from their data is the dyslipidemic burden. Infact
normolipidemic dyslipidemia seen in Asian Indian may have abnormal lipid fractions. Asian Indians have abnormal lipid ratios, lower HDL values and have abnormal triglycerides and triglyceride-rich lipoproteins. The 'low HDL' syndrome and 'normolipidemic' dyslipidemia among native Asian Indian needs a more critical evaluation. Also there is a need to establish normal Indian laboratory values as per IFCC guidelines.

**REFERENCES**