

# Trends of Nutritional Status in Urban India, a world prospective

unpublished paper of Dr. Subhas Mukherjee

Department of Physiology, B.S. Medical College, Bankura, and University Post-Graduate College of Medicine, Calcutta University, & Malay Chatterjee, Department of Pharmacy, Jadavpur University.

Civilization, progress and development are inevitable yet' extremely complex socio-biological phenomena characterizing all living human communities. All of us seem to know all about it in a vague way; none of us seem to know anything about it in a clearly objective perspective. At the present state of our knowledge and experience the only justifiable approach to evaluate the phenomenon is to undertake objective monitoring system analysis of its effects on man's physical health using sensitive and reliable parameters, the technology for studying the problems of mental health still being largely in the realm of inconclusive experimental research laboratories. Be it what if may, the urbanization phenomenon have been an integral part of this evolutionary developmental process. Leaving aside the dictums of popularly held subjective beliefs, superstitions and nostalgic romanticism, very few properly designed objective studies have been made this country to evaluate the impact of urbanization on the nutritional status, obviously, one of the most reliable parameters of the health and well-being of the populace at large. The present urban population in India is around 120 millions and. according to the draft Fifth Five Year plan, it is expected to increase to nearly 140 millions, forming approximately a quarter of the total population of India by 1986. India is currently classified as a developing country. A stable and indigenous socio-economic-political-demographic restructuring in the currently accepted norms of this highly populous land with one of the oldest and uniquely continuous civilizations is yet to take place in the current global perspective. Without in any way attempting to analyze the components of this highly complex evolutionary phenomenon, our primary objective in this communication has been an attempt to evaluate objectively one of the most widely accepted biological parameters of health and well-being of man, viz., the nutritional status of the Indian population vis-a-vis urbanization.

In quest of a simple, dependable and sensitive yardstick for monitoring the overall nutritional status of large population, groups over long period of time, menarchial age is a sensitive parameter of nutritional index:

It is extremely difficult to choose a single or a battery of parameters suitable for critical evaluation of the overall nutritional status of a whole nation. The difficulty becomes still more intensified when one strives to search out a relatively commonplace and simple enough index for which reliable, quantitative data acceptable for bio-mathematical computation are available on a global scale, over the past centuries, for the purpose of comparison. In this regard many, of the commonly used mortality and morbidity figures are often fallacious as parameters of the overall health status of any community. In this communication the age of 'initiation of the first menstruation, the menarchial age, has been utilized as a rather unorthodox but sensitive and simple parameter for evaluation of the overall nutritional. Status of a community.

Menarche, that is the initiation of first menstruation in young girls, is one of the most conveniently identifiable specific, physiological milestones of human growth and development, along with some other specific pubertal developmental features such as pubertal growth spurt and development of the specific secondary sexual characteristics embodied in the growth of the female breasts and female sexual hairs. Menarche, the first indication of the completion of the physiological development, involves the physiological maturation of the brain, the endocrine glands and their hormones along with the general body growth. These individual developmental processes are in fact inseparably, essentially

and primarily dependent upon the general metabolic and nutritional status of the whole organism. Apparent differences in the age of puberty 'between different races of mankind are attributable to differences in the standard of living [van der Warf Ten Bosch, 1964]. The belief that there is more love in a hot climate at earlier ages than in the temperate regions was denied by Robertson (1851) over a century ago. The basis of this belief is the curious set-back in rate of growth and rate of sexual maturation in Western Europe which occurred 150 to 200 years ago and from which the Western nations have been gradually recovering since the middle of the 19th century.

For European girls, menarchial age has come down from 15 years (Raciborski, 1844) or more (Tanner, 1962) to 12-13 years in just over 100 years' time. In Japan the menarchial age is advancing at the rate of one year in a period of eight years (Matsumoto, 1963). In Sweden during the last 50 years the average age of menarche is going down at the average rate of 10 days per annum. In the U.S.A. there was acceleration in Menarche amounting to 4 months between the years 1930 and 1938. The Negroes of U.S.A. also show the same trend. This secular trend in the advancement of the pubertal developmental processes is now a well recognized worldwide phenomenon in the developed Countries, and is attributable to the favorable care and nutrition of the young infants and the children (Acheson and Fowler, 1961). Experimental support for this view are the findings that early 'handling' and abundant supply of milk caused by the small size of the litters can accelerate puberty in the rat (Morton et al, 1963; Engle et al, 1937; Kennedy and Mitra, 1963), Frisch (1970, 1971, 1972, 1974), Frisch and Reveille (1969, 1971) and Frisch et al 1973, conveniently showed that an invariant 'critical' body weight associated with a minimum level of stored, easily mobilizable energy in the form of fat is, necessary for initiation of menstrual cycle in the human female of North America and Europe.

### **Summary of the Results and Conclusion**

On the basis of the above consideration the menarchial age along with other well recognized milestones of pubertal developmental indices, backed up by relevant laboratory tests considered as a sensitive index of nutritional status, were analyzed and computed in different socio-economic religious-ethnic groups in West Bengal. They were also compared with the available figures in this country as well as from different parts of the world, during the past 100 years approximately. Comparison was also made between the urban, semi-urban, and rural-agricultural population groups of otherwise comparable indices. Some of the statistically significant relevant findings are as follows:

(A) The 'invariant' critical body weight (and the accompanying nutritional status) for a given axial length, as a sensitive correlate of the menarchial age, applicable for U.S. and European females, also appears to hold good for Indian girls of all the socio-economic-religious-ethnic groups studied. This suggests the universal applicability of the phenomenon.

(B) The menarchial age of Calcutta girls of a number of socio-cultural groups has fallen significantly over the past 30 years, and is approaching at present that of the U.S. and European females. This suggests a progressive improvement of the, nutritional status of our urban population as a whole, over the past 30 years.

(C) The menarchial age of rural girls around Bankura and Hooghly districts of West Bengal significantly higher when compared to that of Calcutta suggests a relatively poorer nutritional status of our rural population compared to the urban. The significantly advancing menarchial age of Calcutta population and the age discrepancy between the urban and rural population of West Bengal has also been observed by other investigators (Kurjel, 1920; Sen., 1953; Sarkar and Chowdhury, 1967).

(D) The secular trend of transition from higher to lower menarchial age over the past century has been more spectacular in European and U.S. population when compared to the Indian. This is apparently to a large extent due to the much higher menarchial age of the European population compared to the Indian/100 years ago. This finding might indicate that in relative terms the nutritional status of the Indian population was better than that of Europe, a century ago. However, this could also be explicable on the basis of higher levels of nutritional requirements of the higher percentage of relatively taller girls of the temperate regions, rather than on the basis of relatively inadequate nutritional availability. It appears therefore that in spite of the pitiable state of the urban centers of India, the nutritional status is significantly better there when compared to the rural areas. Drawing our cue from biological models, it appears that the interaction of the man and his milieu results in the inevitable changes in both the components. Urbanization could be visualized as a socio-biological homeostatic phenomenon consequent upon the response of the Homo sapiens against the challenges of altered circumstances towards survival and improved quality of life so despite the widespread nostalgia of rural life and the periodic slogans of 'Go 'back to the villages', urbanization has been and will presumably continue to be a main citadel of our survival, against the inevitable historical exigencies.

Still continuing to draw our analogy from biological model, it appears that the changes involved in a feed-back servomechanism may be homeostatic (physiological) or adaptive (pathological). The dynamically reversible homeostatic response results in increased efficiency of the organism promoting further growth and development against continuous challenges of its changing environmental situations. Failure of such homeostatic responses results in gross, often irreversibly pathological organic 'adaptive' responses, adaptive to the extent of temporary survival but eventual inevitable stagnation, vegetation, decay and death of the organism. The reversible nature of the nutritional deficiency effects of our city population suggests operation of a homeostatic mechanism by which the essential-normal potentialities of our people have been somehow maintained through the age and saved so far from irreversible permanent crippling of our national health by irreversible adaptive survival reactions. The falling menarchial age in Calcutta population after centuries of stagnation might in fact signify a major break-through in the nutritional condition of the Indian population, and one could almost identify the situation as a nutritional dividend of urbanization, in spite of the fact that it is our cities that are bursting their seams with their teeming multitudes in squalor and chaos. Apparently the time seems to be ripe enough now to take a fresh cool look at the situation to decide the fixation of proper priority distribution of resources between the rural and the urban areas and for establishment of a healthy feed-back relationship between the towns and the villages, between the primary and the secondary sources, without getting muddled up in the insoluble age-old riddle of the priority between the seed and the plant. Without stretching the imagination unduly long, it is our contention that We Indians with our very long rural tradition and continuous culture have by and large remained suspicious and alien to the modern sophisticated high technology and to the modern city life. This has probably resulted in our failure to look upon our cities, our Varanasi, our Delhi and our Calcutta, not as the citadels and bastions against the ravages of historical challenges, but merely as freaks of the time.