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OBESITY EPIDEMIC IN INDIA

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Lectrure of home science

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Obesity in India has reached epidemic proportions in the 21st century, with morbid obesity affecting 5% of the country's population. India is following a trend of other developing countries that are steadily becoming more obese. Unhealthy, processed food has become much more accessible following India's continued integration in global food markets. This, combined with rising middle class incomes, is increasing the average caloric intake per individual among the middle class and above income households. Obesity is a major risk factor for cardiovascular disease, NGOs such as the Indian Heart Association have been raising awareness about this issue. While studying 22 different SNPs near to MC4 -R gene, scientists have identified a SNP (single nucleotide polymorphism) named rs12970134 to be mostly associated with waist circumference. In this study more than two thousand individuals of Indian origin participated and the aforementioned SNP is highly prevalent in this group. Internationally, a BMI over 25 kg/m2 is considered overweight. Due to genetic tendency of Indians towards abdominal obesity and its associated risk of related lifestyle diseases like Diabetes & Heart Disease , Ministry of Health & Family Welfare along with the Indian Council of Medical Research released updated guidelines (in 2012) that a BMI over 23 kg/m2 is considered overweight. [Further definitions: Normal BMI: 18.0-22.9 kg/m2, Overweight: 23.0-24.9 kg/m2, Obesity : >25 kg/m2.

NFHS data: This is a list of the states of India ranked in order of percentage of people who are overweight or obese, based on data from the 2007 National Family Health Survey. [4]

States	Males (%)	Males rank	Females (%)	Females rank
India	12.1	14	16	15
Punjab	30.3	1	37.5	1
Kerala	24.3	2	34	2
Goa	20.8	3	27	3
Tamil nadu	19.8	4	24.4	4
Delhi	45.5	36	49.8	64
Andara Pradesh	17.6	5	22.7	10
Sikkim	17.3	6	21	8
Mizoram	16.9	7	20.3	17
Himachal Pradesh	16	8	19.5	12
Maharashtra	15.9	9	18.1	13
Gujarat	15.4	10	17.7	7
Haryana	14.4	11	17.6	6
Karnataka	14	12	17.3	9
Manipur	13.4	13	17.1	11
Uttrakhand	11.4	15	14.8	14
Arunachal Pradesh	10.6	16	12.5	19
Uttar Pradesh	9.9	17	12	18
Jammu and Kashmir	8.7	18	11.1	5

Bihar	8.5	19	10.5	29
Nagaland	8.4	20	10.2	22
Rajasthan	8.4	20	9	20
Meghalaya	8.2	22	8.9	26
Odisha	6.9	23	8.6	25
Assam	6.7	24	7.8	21
Chhattisgarh	6.5	25	7.6	27
West Bengal	6.1	26	7.1	16
Madhya Pradesh	5.4	27	6.7	23
Jharkhand	5.3	28	5.9	28
Tripura	5.2	29	5.3	24

NEW DELHI: India is now in the grip of an obesity epidemic and the trend needs to be immediately arrested by taxing junk food, restricting food ads and making food labelling clearer, according to a study. The study that looked at the burden of overweight citizens in six countries -- Brazil, China, India, Mexico, Russia and South Africa -- has found that between 1998 and 2005, India's overweight rates increased by 20%.

Currently, almost 1 in 5 men and over 1 in 6 women are overweight. In some urban areas, the rates are as high as 40%. Published in the Lancet on Thursday by the Organisation for Economic Co-operation and Development (OECD), the study warns that low-income countries cannot cope with the health consequences of wide scale obesity. When compared to the other five countries, the percentage of adult women and men who are overweight in India was found to be lowest -- 14% and 18%, respectively. In comparison, 23% women and 32% men are overweight in China.

"However in absolute numbers, the burden would be mammoth in India and China," experts said. According to estimates in the study, the annual cost of broad-based prevention strategies tackling obesity and other health threats, such as alcohol consumption, smoking, high blood pressure and

cholesterol, would be less than $2 per person per year in India and China, less than $3 per head in Brazil and around $4 per person in South Africa, Russia and Mexico.

Upto 4,42,000 life years could be gained through a combination of prevention programmes in India every year. The cost-effectiveness ratio of a prevention strategy would be $268 per life year gained in good health in India and $380 in China, the study said.

OECD lead author Michele Cecchini said, "The results varied across countries surveyed. Seven in 10 Mexican adults are overweight or obese, while nearly half of all Brazilians, Russians and South Africans are also in this category. China and India report lower levels of obesity, but are also rapidly moving in the wrong direction. Low- and middle-income countries have far fewer health care resources to deal with the consequences of obesity, which include higher rates of cardiac disease, cancer and diabetes."

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obesity is the root for several non-communicable diseases (NCDs). Another study in the Lancet on Thursday predicts that by 2030, nearly 70% of all global deaths will be from non-communicable diseases like cancer, diabetes, and respiratory and heart disease. Of these 70% of deaths, 80% will be in the less wealthy nations like India. According to WHO, NCDs -- principally cardiovascular diseases, diabetes, cancers and chronic respiratory diseases -- caused an estimated 35 million deaths in 2005. This figure represents 60% of all deaths globally, with 80% of deaths due to non communicable diseases occurring in low- and middle-income countries, and approximately 16 million deaths involving people under 70 years of age.The total deaths from NCDs are projected to increase by a further 17% over the next 10 years. The greatest increase will be seen in the African region (27%) and the Eastern Mediterranean region (25%). The highest absolute number of deaths will occur in South-East Asia. Up to 80% of heart disease, stroke and type-2 diabetes and over a third of cancers can be prevented by eliminating shared risk factors, mainly tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol.

Origins of epidemic in India

Obesity is now reported in young Indian adults and even in children. The crucial questions are: what are the predis-posing causes; how much of it is genetic; is it acquired in utero, during childhood or later? Prevention of obesity and, therefore, of the diabetes epidemic will be influenced by answers to these important questions. It is still unclear what role genetic factors play in the obesity epidemic. The possible role of intrauterine factors in the pathogenesis of adiposity, especially in Indians, will be discussed. Intrauterine origins of adult obesity? Hales & Barker (1992) and Barker (1998) have suggested that the current epidemic of type 2 diabetes and CHD originates in maternal and fetal under nutrition. The 'fetal origins' concept is based on the finding that there is an inverse relationship between birth weight (or ponderal index, as a easure of 'thinness') and prevalence of diabetes, insulin resistance syndrome and CHD in later life. The concept of (maternal and fetal) under nutrition is based on smaller size at birth rather than any measurements of food intake or circulating nutrients in the mother. Also, there are many non-nutritional determinants of size at birth, and the fetal supply line is long and has many non-nutritional regulators (Harding, 2001). It may thus be inappropriate to assume that small size at birth is a reliable reflection of maternal under nutrition. The relationship between size and body composition (which has a strong influence on subsequent morbidity and mortality) varies in different populations. Some caution is therefore necessary in the interpretation of these epidemiological studies. In addition, the relevance of retrospective studies in Europid populations born in the earlier part of the twentieth century to the contemporary populations in the developing world needs to be carefully assessed. Apart from such difficulties, the concept of 'fetal origins' is an attractive one and in some ways states' obvious truth'. Of an estimated average of fifty divisions of cells in an individual's lifetime at least forty are completed before birth (Milner, 1989). Thus, a large part of human development is over before birth. A human newborn is in many ways a miniature adult. This situation suggests that the intrauterine environment could have a profound and permanent effect on the structure and function of the developing organism ('programming'),which will determine the state of health in later life.Studies relating intrauterine experiences to obesity in later life The first report linking intrauterine under nutrition' with later obesity was based on the follow up of offspring bornto mothers who experienced the Dutch famine in pregnancy (Ravelli et al. 1976). The risk of obesity was found to have increased in 19-year-old boys whose mothers had faced famine in the first trimester, and reduced if they had been exposed in the third trimester. The

intrauterineorigins of obesity have been reviewed recently (Martorell et al. 2001; Oken & Gillman, 2003; Rogers, 2003).The majority of reports have used birth weight as asurrogate for intrauterine nutrition. The biological relation-ship between birth size and later outcomes appears to be'U' shaped; however, this relationship may be modified in different populations (Fig. 2). The relationship between later obesity and larger birth weight could partly reflect an effect of maternal diabetes, but not necessarily so. Reasons for the association between lower birth weight and later obesity are not clear and could include contributions from altered body composition, appetite and physical activity pattern, and as yet unidentified changes in energy metabolism.

Causes of the epidemic

The strongest risk factor for obesity is urbanization (Fall,2001). Obesity is at least three times more common in cities than in villages, although it is increasing rapidly even in villages because traditional villages are also becoming urbanized in their habits (urbanization in situ, also termed rubanization). Another related risk factor is higher socio-economic status. This situation is opposite to that in developed countries where lower socio-economic groups are more affected ('reversal' of socio-economic gradient). In simple mechanistic terms weight gain occurs when energy intake by an individual exceeds energy expenditure over a period of time. Changing patterns of food intake (both in quality and quantity) and physical activity contribute to the positive energy balance. Genetic as well as non-genetic determinants affect an individual's response to energy intake as well as physical activity, and therefore influence the balance etween the two factors (Prentice, 2001). It is possible that a 'thrifty genotype' may have helped man survive famine conditions by successfully depositing fat. However, in the current situation of excess food and reduced activity this genotype may lead to obesity. Like most other polygenic conditions, the contribution of genetic factors to obesity is not clear at the population level. However, a number of rare syndromes of extreme obesity have been related to specific mutations in genes (Barsh et al. 2000). Studies in twins also favour a role for genetic factors in the aetiology of obesity (Bouchard et al.1990; Sims, 1990). It is possible that like other chronic polygenic is orders (diabetes and hypertension), the expression of obesity is influenced by environmental conditions. Recent interest has focused on the possible role of early- life environment in the pathogenesis of obesity.

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