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Rising Trends of Metabolic Risk Factors

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***Abstract* – Indian society, being at a transitional phase from economic point of view, young adults switching over to fast food diet, physically inactive and lethargic in their behaviour, and at the same time having a genetic predisposition for metabolic risk factors like hypertension, diabetes, changed lipid profile and obesity could be very strong contenders for cardio vascular and cerebro-vascular diseases. Therefore, generations need to be apprised regarding these life-style anomalies so that they remain disease free to create a healthy society and a nation with strong health markers and thereby economy.**

***Keywords* – Diabetes, Dyslipidemia, Hypertension, Obesity, Physical Inactivity.**

In the changing scenario of society the world over, diabetes mellitus, hypertension and dyslipidemia are emerging out to be the main factors which could be described as lifestyle anomalies having link with coronary artery disease, heart failure and cerebro-vascular diseases. These risk factors in association with obesity, particularly the central obesity lay out a way to biochemical changes in the metabolic processes and act as the precursors of the deadly diseases. A large waist line, high triglycerides level, a low high density lipoprotein (HDL) cholesterol, high blood pressure and high fasting blood sugar are the five conditions described as metabolic risk factors. According to National Institute of Heart Disease, diabetes and stroke increase with the number of metabolic risk factors. A person who has metabolic syndrome is twice at the risk of developing heart disease and five times higher chance of developing diabetes as compared to someone who does not have it. Having even one risk factor raises the risk of heart disease.

Obesity is often defined as a condition of abnormal or excessive fat accumulation in adipose tissue to the extent that health may be impaired. It is a complex multi factorial disorder that affects children and adults alike. Obesity is becoming a global health problem as industrialized and developed countries are showing increasing trends in its prevalence over the last two decades while developing countries are showing a rise in overweight persons among their population because of the improvement in their economic conditions. Increasing prevalence of obesity in a population particularly among children and young adults is an early indicator of emerging health burden due to non-communicable diseases like insulin resistance and high blood sugar. Over and above a lethargic lifestyle and fat-laden food consumption can deteriorate the condition to act as a prelude for high blood pressure and cardiovascular diseases. As per the two surveys conducted by Centres for Disease Control and Prevention,2012 [2] about 68.8% of adults above twenty years of age are considered to be overweight or obese, 35.7% are considered to be obese and 6.3% have extreme obesity. Prevalence of obesity for both men and women is similar at 36% [14]. In the age group of 12-19 years approximately 18.6% boys and 15% girls are considered to be obese [33]. Obesity has reached epidemic proportions in India with morbid obesity affecting 5% of country's population [44] and Indians are genetically susceptible to weight accumulation especially around the waist. Single Nucleotide Polymorphism near MC4R, named rs12970134 is associated with waist circumference and insulin resistance [7]. National Family Health Survey ,2007 [32] tabulated 12.1% males and 16% of females as overweight and obese with Punjab ranking at first level with 30.3% of males and 37.5% of females being overweight and obese. Studies using Indian specific criteria for overweight (BMI $\geq$ 23), obesity (BMI $\geq$ 25) and abdominal obesity (WC $\geq$ 90 cm in men and $\geq$ 80 cm in women) have found the prevalence rates among Asian Indians exceeding those in US population. The age-standardized prevalence of generalized obesity in South India was 46% (women: 47%; men: 43%) compared to 35% in US. Abdominal obesity was found in 47 -51% with higher rate in women (women: 56%; men: 35%). Among 5% of men and 14% of women, abdominal obesity was found with normal BMI i.e. isolated abdominal obesity was reported [29] [9]. In New Delhi Birth Cohort aged 36 years, the prevalence of obesity was 54% in men and 66% in women, when BMI>25 was taken as criteria to identify obesity, and more than 80% individuals were overweight [20]. A study quoted an alarming figure of 70% urban Indian population being obese or overweight and people in the age group 24-39 years in metros or booming small towns are at the risk of being obese. There are more than thirty medical conditions associated with obesity and the most prevalent obesity related diseases are diabetes, high blood pressure, high cholesterol, heart diseases or cardiovascular problems [21].

Diabetes mellitus and hypertension have emerged as major medical and public health issues world over. According to World Health Organisation [25], the prevalence of diabetes mellitus in adults worldwide was estimated to be 4.0% in 1995 and is predicted to rise to 5.4% by the year 2025 as a resultant the effectual number of adults with diabetes would rise from 135 million in 1995 to 300 million in the year 2025. A study [8] conducted in 199 countries to assess the global trends in diabetes has reported that the number of people with diabetes has increased from 153 million in 1980 to 347 million in 2008. A much higher figure has been projected by International Diabetes Federation with 366 million people affected with diabetes the world over and a continuation of this trend expect it to further increase to 552 million people by 2030 i.e. every tenth individual will be affected. About 132 million people from Western Pacific Region, 71.4 million from Southeast Asia and 14.7 million from African region were speculated to be the sufferers [48]. A rapid increase in the incidence of type2 diabetes in the young adult population of Finland is reported to be a public health problem [26]. A study [1]

revealed that the number of American Indians and Alaska Native children (<15 years), adolescents (15-19 years) and young adults (20-34 years) with diagnosed diabetes increased by 71% (4534 to 7736); prevalence increased by 46% (6.4 per 1000 to 9.3 per 1000 population). Increases in prevalence were greater among adolescents and young men. In Pima Indian population previously diagnosed diabetes and asymptomatic hyper-glycaemia were reported to be more frequent in subjects of 15-24 year old than other populations and glucose intolerance was associated with obesity [39]. A screening on Indian population for diabetes [37] undertaken in 2012 indicated that 21 percent subjects aged 20-29 years suffered from diabetes. It is a clear indicator that Type 2 diabetes - attributed to genetic causes and lifestyle is affecting the youth. The study revealed that lifestyle issues are making youngsters prone to diabetes. Many youngsters had high sugar level with borderline diabetes. It was research out [19] that early onset of type 2 diabetes appeared to be a more aggressive disease from a cardiovascular standpoint. Although the absolute rate of cardiovascular disease is higher in older adults, young adults with type 2 diabetes have a much higher risk of cardiovascular disease relative to age matched controls. According to American Diabetes Association,2013 [2] the development of type2 diabetes among young individuals has significant public health consequences as these youth are likely to manifest the complications of diabetes, including retinopathy, nephropathy, neuropathy and cardiovascular diseases, at a time that should be the most active and productive of their lives. Both hypertension and kidney disease were reported to progress rapidly regardless of the treatment. The incidence of hypertension rose from 11.6 percent to 33.8 percent after 3.9 years, despite receiving the best possible treatment. Males were at 81 percent higher risk for developing high blood pressure than females consistent with adult findings in terms of gender differences in hypertension. Weight has an important implication and increases its risk: for every one unit of increased body mass index (BMI) there was a six percent increased risk for high blood pressure. A research report [43] flashed that 450 million individual world over and 65 million in India, the second after China, are affected by diabetes and 592 million would likely be the ones to get affected by 2035. It was further added that even non obese people having a BMI less than 25kg/m^2 suffer from disease. Young Indians who are not even obese can develop the disease because they have excess abdominal fat and subcutaneous fat in limbs and calf. Also it projected the views of WHO regional director for South-East Asia according to whom, by eating right, being physically active and maintaining healthy weight can cut the risk of diabetes. This could lead to major rise in heart ailments, kidney failure and other infectious diseases having its economic burden.

Hypertension, on the other hand, affects about one billion people worldwide [6] and it is estimated that by 2025, up to 1.56 billion adults worldwide will be hypertensive [23]. In developed countries the prevalence of hypertension is beginning to stabilize [34]. In contrast, in developing regions like South East Asian and African region a continuous rise has been reported and about one-third of the adult population has high blood pressure and nearly 1.5 million deaths occur because of it. Epidemiological studies [17] have indicated an increasing trend of hypertension in urban Indian population. As per the meta-analysis [28] of prevalence on hypertension in India from January 2000 to June 2012 about 40.8% urban and 17.9% of rural Indians are hypertensive. An increase of hypertension in Indian population from 1-3% in 1950 to 10-30.9% in 2002 was projected in another study [36]. The World Health Organisation depicted overall prevalence of raised blood pressure in adults aged 25 and above to be around 40% in 2008. A study by National Institute of Health [32] reported that more than 65 million Americans suffer from the effect of high blood pressure and quoted a study to reveal that 19% of youngsters in age group 24-32 years are affected with high - blood pressure compared to the earlier studies where only 4% showed the discrepancy. In a study [22] carried out on rural men older than 20 years, 33.9% of men either had systolic blood pressure (≥130 mm Hg) or high diastolic blood pressure (≥ 85 mm Hg), even in the absence of obesity and these individuals were tracked to stunting, and higher BMI in early childhood as well adolescence. A rise in prevalence of sustained hypertension in both rural and urban population of individuals as young as 10-17 years having its correlation with obesity was also indicated [30]. A study [45] as per WHO statistics 2012, elucidated that 23.10% men and 22.60% women above twenty five years of age suffer from hypertension, although better than the global average (men: 29.20%; women: 24.80%) which was considered to be a huge chunk in absolute number. Wrong habits like eating late, excessive time spent on smart phones by youngsters who spend more time in virtual world than being physically active and their sedentary life style contribute to the rising level of hypertension.

Dyslipidaemia is a major risk factor that plays a role in the progress of atherosclerosis, the underlying pathology of cardiovascular disease. The prevalence of dyslipidaemia varies depending on the population studied, geographic location, socioeconomic development and definitions used [13] [18] [3] [27] [35] [52] [12] [42]. Caucasians generally have higher mean total cholesterol concentration than the populations of Asian or African origin [16] [47]. However, inhabitants of developing world now have access to more fats in their diets and more sedentary lives; therefore the disease is becoming an increasing problem. Globalization of the western life style contribute to the worldwide increase in adiposity and diabetes not only in adults but also in children and adolescents [24] [41]. A study [15] on lipid profile in university male and female students in Brazil reported percentage level of subjects for high triglycerides (23.0%), total cholesterol (9.7%), cholesterol associated with low density lipoprotein (5.9%) and reduced value of high density lipoprotein (12%) in subjects having a significant association with smoking and physical inactivity which could lead to high cardiovascular diseases in adulthood. Keeping in view the rising trends of hypertension, a study [31] on young hypertensive adult males aged 25-35 years and reported a better lipid profile

for vegetarians compared to non vegetarian individuals and a higher level of blood pressure, body mass index and mid upper arm circumference among non vegetarians attributing it to higher intake of energy and fat. As a component of the metabolic syndrome, insulin resistance, dyslipidemia often coexists with obesity, visceral adiposity, and hypertension [10] [40]. All these factors are intertwined and genetic susceptibility plays an important and crucial part in their expression but changes in environmental arena could not be denied as well. Lifestyle changes in developing transitional societies with urbanisation and economic development [50], physically passive behaviour like long hours of sitting while watching television and working on computer [11], inactive behaviour accompanied with intake of fat-laden fast food are important changes which provide required environment for letting the genetic factors express their mark.

CONCLUSION

Indian society being at the flux of social change is fast heading towards a situation where people, more especially the young adults with changing life style and spending power do opt for fat laden fast food, lethargic habits and physical inactivity because of changing nature of working conditions. This accompanied with a genetic predisposition for diabetes, hypertension, dyslipidemia and rising trends of obesity they are becoming ripe contenders for the various diseases associated with changing lifestyle. Thus, there is a strong need in the young adults to learn about these life-style changes which are gripping the generations faster than expected otherwise instead of a strong workforce our society would land up with a diseased generation which might be a burden to the economy rather than a boost. There is a need to design special awareness programmes for educational institutes so that the younger generation acquires a knowledge and impact of changing life style.

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