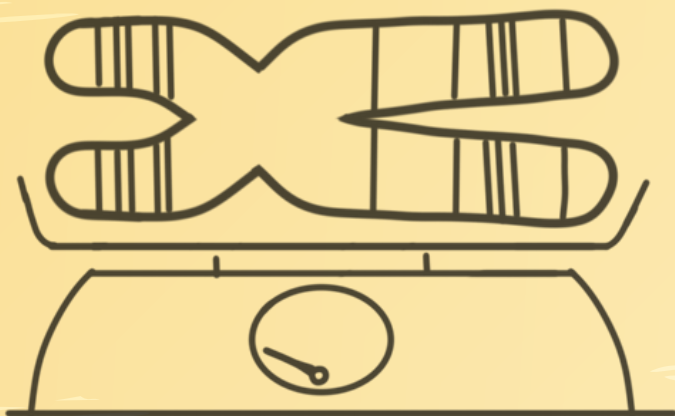


Do these genes make you look fat?

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Studies show that over the last few years the “weight loss” industry seems to have raked in over 150 billion USD annually. These figures were seen rising especially during the ongoing pandemic because people had a lot of free time at hand and a perpetual need for Endorphins that exercise seemed to fulfil. Ironically, Worldwide Obesity rates were also seen increasing tremendously and that matters because obesity now kills more people than malnutrition does!

So, what is going on? Why are self-control and diet unable to curb the spread of this global obesity epidemic? The answer lies within us: Genes!

Genetic basis of obesity was noticed when two Pakistani siblings first reported in Cambridge university in 1997 with “excessive weight gain”. The elder one, 8 year old weighed 86kg, as much as a tall grown man and the younger 2 year old boy, tipped the scales at 29kg. Both the children failed to be satiated no matter how much they eat. Some quick tests pointed the scientists towards the problem: both children lacked leptin, a hormone that regulates appetite. The scientists found that the brothers had a mutation in the gene responsible for leptin production – called ‘ob’ for obese.

According to the ‘thrifty gene’ hypothesis, our ancestors evolved genes for efficient food collection and fat deposition in order to survive periods of famine and now that food is continuously available, these genes are proving to be disadvantageous because they are preparing our bodies for a famine that never comes, thus creating an “obesogenic” environment. The obesity epidemic can be considered as a collective response to this environment.

Clear Inheritance patterns for obesity among families are yet to be established but there are a few variants of genetic inheritance of obesity like Monogenic Obesity, Syndromal Obesity and Multifactorial Obesity.

Rarely, obesity occurs in families due to the inheritance of mutations of a single gene. The genes responsible are most often the basis for signals and responses that guide food intake and energy expenditure. They may also be associated with certain biochemical and metabolic processes that regulate adiposity. When it comes to syndromal obesity,

it is associated with phenotypes that include intellectual disabilities, abnormal facies or organ-system specific abnormalities. But obesity most commonly results from complex interactions among multiple genes that influence certain obesogenic behaviours or alter some metabolic processes or both.

These genetic alterations most commonly occur in genes that code for substances that regulate the balance between orexigenic and anorexigenic hypothalamic pathways, more specifically affecting the melanocortin-leptin metabolism. Epigenetics, environment and dietary factors or gut microbiota can influence the programming of parental genes. Adiposity associated with complex genetic influences can be diagnosed with a history suggestive of hyperphagia (overeating), endocrinological co-morbidities and a detailed pedigree including the history of consanguinity. Also routine family history collection helps to identify people at high risk for obesity-related diseases.

Obesity is a family heirloom no one asked for and self-control alone is rarely enough to overcome the powerful effects of genes. Although for most genetic causes of obesity, management of nutrition with long term restriction of calorie intake and physical activity remains the first line of therapy, certain medications used as replacement therapies in deficiencies are also under trials. Bariatric Surgery is increasingly being used as an effective treatment for severe obesity with or without concomitant co-morbidities in adolescents and adults.

Researchers working to untangle how genetics, epigenetics and the environment work together to drive obesity away have set a giant task for themselves. But it’s one they must accomplish if they hope to turn the tide over this global obesity epidemic.