

Communicable behavior of non-communicable diseases**Prashant Shukla^{1*}, Anita Gupta¹, Vijay K. Sehgal¹, Raghuvansh Kumar²**¹Department of Pharmacology,²Department of Medicine,
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Patiala, India**Received:** 11 July 2016**Accepted:** 09 August 2016***Correspondence to:**Dr. Prashant Shukla,
Email: dr.prashant.shukla@outlook.com**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.**ABSTRACT**

Communicability of non-communicable diseases can be explained using the prototype of non-communicable diseases. The concept can be further extended to other non-communicable diseases. Diabetes mellitus (DM) is regarded as the prototype of non-communicable diseases. Its subtype, type 2 DM is usually associated with obesity. Obesity, in turn, can be attributed to deranged eating habits and lack of physical activity. Eating habits of a person bears a close resemblance to the parental eating habits. Other factors contributing to obesity like alcoholism can also be transmitted from parents to child. Smoking, another factor implicated in DM, can be picked as a habit from peer group as well as family. All these factors implicated directly or indirectly in the pathogenesis of DM are actually components of lifestyle. These lifestyle components can be transmitted both in an inter-generation and intra-generation fashion. And so the chances of transmission of DM (a lifestyle disease) in the same fashion cannot be ruled out.

Keywords: DM, Lifestyle transmission, Non-communicable diseases, Obesity**INTRODUCTION**

Diabetes mellitus (DM) has grown leaps and bounds over the past three decades which poses a daunting challenge to the treating physicians and other health professionals.¹ The world wide prevalence of DM has risen from 30 million cases in 1985 to 177 million cases in 2000.² As per the International diabetes federation estimates, there are around 415 million diabetics worldwide in 2015 out of which 78 million are in South-East Asian Region (SEAR) alone. By 2040, this figure has been projected to rise to 140 million in SEAR. There were 69.1 million cases of diabetes in India in 2015.³ This alarming rise and equally distressing future trends of the disease is forcing us to look out for the loopholes in the management of this disease. From the epidemiological experience, the various attributable risk factors of the disease are obesity,

alcoholism (particularly heavy drinking), smoking, sedentary lifestyle and nonetheless genetic predisposition to the disease as well as increasing age.⁴⁻⁷ Aging and genetic predisposition to the disease are non-modifiable risk factors. Other factors viz. obesity, alcoholism, smoking and sedentary lifestyle are placed under the modifiable risk factors.

Diabetes Mellitus and its various implicated causative factors

Diabetes mellitus has been broadly classified into type 1 DM and type 2 DM.⁸ Type 2 diabetes accounts for 90 - 95% of all diabetes cases.⁹ Out of these two types of DM, obesity accompanies type 2 DM, particularly in a central or visceral location and is thought to be a part of the pathogenic process. The role of obesity in the

pathogenesis of type 2 diabetes is complex and is confounded by many heterogeneous factors. The results of a study conducted in North India indicated that there was a high prevalence of obesity, both abdominal as well as generalized, among type 2 diabetic individuals according to the body fat percentage.¹⁰ Another study showed that central obesity were significantly associated with diabetes.¹¹ According to a study published by ICMR in 2016, the obesity is affecting children and adolescents of not only the higher socio-economic groups but also the lower income groups.¹²

The classical theory of disease classification places Diabetes mellitus under non-communicable diseases. Non-communicable disease is defined as chronic conditions that do not from an acute infectious process and hence are “not communicable”.¹³ Defining non-communicable diseases in exact words, however, poses a challenging task. A school of thought even considers the term “non-communicable diseases” a misnomer, because it includes some diseases (notably, cancers of the liver, stomach, and cervix) that do have at least partly infectious basis. Moreover it usually excludes mental illnesses which are notorious in causing long-term disability.¹⁴ DM is one of the most quoted example of non-communicable diseases.¹⁵ But the explosive rise in the incidence and prevalence of DM suggests some kind of underlying transmitting mechanism. Four common behavioural risk factors (fat-rich diet, lack of physical activity tobacco use, and excessive alcohol consumption) are associated with DM type 2.¹⁶

Transmission of causative factors

Although it is established that DM cannot be directly transmitted from person to person via classical modes of disease transmission (i.e. through bodily fluids, contact, etc), the rising incidence of DM pushes us to look for non-conventional modes of transmission. Non-conventional modes of transmission of DM can include the transmission of lifestyle, both good and bad, from one person to another.

A large number of studies are suggestive of the fact that parental behavioural pattern is transferred to their children across generations.¹⁷ Moreover; behaviour of children with respect to lifestyle is also strongly influenced by their parents. And there is a great likelihood that these influences are carried through into their adult lives as well.

For example, children of overweight parents also bear a greater risk to develop obesity themselves. The increasing prevalence of obesity in children emphasizes the importance of environmental factors.^{18,19} A prospective cohort study showed that the risk for childhood obesity is three times more among the children of obese mothers if compared to children of non-obese mothers.²⁰ The probability of transfer of parental obesity to off springs is dependent both on shared genes and environmental

factors.²¹ The passage of dietary attitudes and beliefs across generations is greatly influenced by the familial frequency and daily pattern of meals. Evidence also supports that familial habits affect individual’s both absolute and relative energy intakes.²² Furthermore, the modelling theory of parental influence indicates that parental dietary habits has a direct effect on the children’s dietary habits. Modelling also appeared to have a role in the transmission of eating-related attitudes.²³⁻²⁵

Various studies dedicated on smoking confirm that parental smoking have a direct influence on the probability of uptake of smoking habit by their children and the way they continue their smoking habits in adulthood.²⁶⁻²⁹ As well as parental disapproval of smoking discourages an adolescent to initiate smoking.³⁰ The initiation of tobacco smoking generally occurs in the company of a friend who is a smoker.³¹ Peer smoking also predicts continued smoking among young people who have already begun to smoke.³²

According to more than 50 family studies, it has been concluded that alcoholism runs in families. These studies have shown that there is a two to four times risk of “becoming alcoholic” amongst the first degree relatives (e.g. father, children, siblings, etc.) of treated alcoholics than the relatives of non-alcoholics.³³

The transmission of alcoholism is reflected quite well on the global rise in the alcohol consumption, particularly the developing countries. For example, as per the WHO reports, the south east Asia region has witnessed the most explosive rise of around 68% in per capita alcohol consumption between 2001-2005.³⁴ This data was reinforced by the organization for economic cooperation and development (OECD) reports, 2015. According to the OECD reports, alcohol consumption in India alone has risen by a whopping figure of 55% over a period of 20 years.³⁵

It can be concluded that if a person follows a particular (either good or bad) lifestyle, the likelihood of other family members following the same lifestyle increases. Thereby lifestyle is communicable (although the person can exercise his/ her will to adopt or avoid it).

Over the last few decades, there has been a substantial tilt in the burden of disease towards choice-related illnesses which are basically dependent upon patient’s volition. It includes alcohol and tobacco addiction as well as overconsumption of food. Epidemiologically, this in turn is translating itself into increased incidence of DM and its related complications.

Possible extensions of the concept

Apart from diabetes mellitus, there are many other lifestyle diseases where communicability based on lifestyle transfer cannot be ruled out. These lifestyle diseases can very well include hypertension, chronic

obstructive pulmonary disease, fatty liver, etc. These diseases which classically come under the prerogative of communicable diseases should also be referred as “lifestyle-communicable diseases”.

CONCLUSION

If lifestyle is communicable, it can be very well presumed that lifestyle diseases also follow the same tune. Diabetes mellitus, a lifestyle disease, has a similar course of communicability. It can be transmitted both in an intra-generation and inter-generation fashion as the factors causing it follow the same pattern.

Although the importance of genetic basis of the disease cannot and should not be undermined, but at the same time the mind boggling increase in the incidence of type 2 DM deserves a more elaborate and relatively newer explanation. This is because the possessed gene pool of the population is by large almost constant over the past three decades but the environment played to be the dynamic factor. So it would be legitimate to hold the changing lifestyle to be the primary culprit which modulates the phenotypic expression of the disease. This is where the transmission of disease on the basis of lifestyle transmission comes into picture. Although the transmission of lifestyle may appear to be subtle, but they are transmitted for sure.

To tame the giant problem of DM which continues to grow day by day, the outlook of the medical professionals as well as the society need to be changed. It would not be over zealous to conclude that if the exact epidemiological transmission mechanisms are firmly established, which appear to be lifestyle in this case, it will not be long before the explosive nature of the disease is contained.

Declaration of conflicting interests

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