Stressful Experiences,Workplace Stress, and Type 2 Diabetes: Management of Diabetes

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Abstract

The present paper draws attention towards the common occurrence of daily life i.e., stress along with its relation and linkage with diabetes, which is no doubt reaching epidemic proportions. The paper throws light on the relation between stressful experiences and onset and control of diabetes. It focuses how stress might lead to diabetes and also increase the risk of type 1 and type 2 diabetes. Also in various situations managing diabetes in itself becomes a stressful task and adds up more to added risk. Finally various stress management approaches are discussed in order to ensure proper management of stress so that the quality of life of an individual is not hampered to the extremes and it becomes manageable to cope up or combat with the harmful consequences of stress, which further aggravates or increases the risk of diabetes.

Keywords : *Diabetes; Stress;Control; Risk- factors; Health management*

Introduction

Stress has become a focal point in today's scenario backed up by the harmful consequences of urban living lifestyle where the families are nuclear, occupational life is burdensome and living a happy life in itself has become a challenge. As a result stress is thought to become a fundamental cause of psychological distress and physical illness. Thus the key to a happy and satisfactory life depends on the ability to cope effectively with stress. The more easily and effectively a person manages to cope with the stress, the more efficient life he lives.

There is no particular definition of stress. Theorists define stress in terms of various theoretical models. There are different views regarding the definition of stress. The stimulus models of stress believe that stress is when you are under a lot of pressure or when things are getting on top of you. The belief underlying this model is that human beings have a certain tolerance to stress and when their tolerance falls short to meet the demands and stress becomes too great, then they fall ill. Stimulus models of stress are associated with the approaches to stress management that look forward to reduce levels of stress produced by environment, whether it be physical environment or workplace surroundings.

Response Models of stress basically focus on the psychophysiology of stress and link stress to various illnesses. It focuses on the physical and psychological feelings of being stressed or completely stressed out with various symptoms like that of insomnia, fatigue and poor concentration. The stress management programmes based on these models focus on controlling the psychophysiology of stress using various techniques like yoga, meditation, aerobics and various forms of physical exercises.

Interactional Models of stress focus on the imbalance in the interaction between the perceived demands that is placed on the individual and the

ability to meet those demands that is the coping resources that an individual possesses. Thus accordingto the interactional model, stress occurs when you have too much strain put on you and you don't have enough resources to deal with it i.e., when you are not able to cope with it effectively. These models of stress do not have the drawback posed by other stimulus and response models, that individuals differ in the sense that which stimulus situations do they find stressful and in the way that they respond to those situations. The stress management programmes based on these models lay emphasis on stress management workshops and stress inoculation training.

The social analysis of stress is also possible where stress is analysed as a social construct. Firstly stress is often used as an agent for legitimisingbehaviour that would otherwise be seen as resulting from neurosis, personal inadequacy or anxiety. Secondly stress also serves the function of explaining the otherwise inexplicable, whether it is psychological or physical symptoms of actual illness.

Stress and Physical Illness

The major question that comes into mind is, does stress make us more prone to illness experience? The research findings do not provide a substantial support to the idea that stress is a major determiner of physical illness; neither do they suggest that stress plays a very insignificant role in the experience of physical illness. The problem lies with the fact that it becomes really difficult to carry out well controlled research in this area and also what so ever has been done successfully is open to a wide range of possible interpretations.

Stress and Diabetes

Before turning the discussion towards the relation between stress and diabetes, let's draw attention towards what diabetes is all about. During the second century A.D. a Greek physician,Aretus the Cappodocian, described the patients who were passing too much urine (polyuria) as a siphon and he named the condition as diabainein. Thus the word diabetes came from the English adoption of the Medieval Latin diabetes and it means a siphon. The word mellitus was added to the term diabetes by Thomas Willis in 1675. In Latin, the word “mel”means honey. As the blood and urine of people with diabetes has excess glucose, and glucose is sweet like honey, so is the term coined as “diabetes mellitus” which could literally mean “siphoning off sweet water”. Diabetes mellitus is also known by the name of “sweet urine disease” as in ancient China it was observed by the people that ants would be attracted to some peoples' urine, who were diabetics because it was sweet.

There are basically three types of diabetes.The first type is type 1 diabetes, where the body does not produce insulin and that is why people may also refer this type as insulin dependent diabetes. It is also known by the name of early onset diabetes or juvenile diabetes because people generally develop type 1 diabetes before 40 years of age, in teenage years or in early adulthood. It is found that 10 per cent of all diabetes cases are type-1 diabetic. According to the Search for diabetes in Youth data that was issued by the Centers for Disease Control and Prevention, the prevalence rate for diabetic patients under the age of 20 rose by 23 per centbetween 2001 and 2009.Type 2 diabetes is developed when the body does not develop enough insulin for proper function and develops insulin resistance and the cells in the body of the individual does no longer react to insulin. Of all the diabetes cases worldwide, 90 per cent of the cases are found to be of type 2 category.The third category of diabetes is known as gestational diabetes which affects the females during pregnancy. So basically the focus here will be on the two main types of diabetes, the type1 and type 2.

Physiological reason behind the relation between Stress and Risk for Diabetes

We experience stress when our body feels threatened and starts behaving as if it is under attack. The reasons behind this experience of stress might be physical, mental, and economical or any such situation or stimuli that prepares the body to take action against it or to cope with it as soon as possible. This preparation of the body is termed as fight or flight response wherein the levels of various hormones shoot up for action. The action here is to provide stored energy to the cells in the form of glucose and fat to aid the body in order to evade from the stressful situation or to fight with the danger of stress posed by it. For people who are diabetic there is no enough provision of insulin to nourish or provide the cells with the extra stored energy in the form of glucose and as a result the glucose piles up in the blood which further increases the risk for diabetes.

Also, there are many sources of stress which pose a long term threat on an individual like that of the stress of undergoing a surgery as it might take long to recover from the stressful aftereffects of surgery and regain a normal state as before which results into long term high blood glucose level. The long term effects of mental stress also poses the same threat of higher blood glucose level for a longer period of time because neither fighting nor fleeing from the situation will fetch any help when the own mind becomes the enemy. Thus in people with diabetes, stress can alter the blood glucose level in two major ways. Firstly the people who are experiencing stress might not take ample care of them and secondly the release of stress hormones in itself might alter the level of blood glucose.

Scientists have also studied the effects of stress on glucose levels in people and animals. It has been found that mice exposed to physical stress or undergoing mental stress has an upsurge in the levels of glucose. In human beings the results have been mixed as most people's glucose level go up with mental stress, while for others, level of glucose may go down. Also it has been found that the experience of physical stress raises the level of glucose in either type of diabetes. In people with diabetes type 2, mental stress leads to elevated levels of blood glucose(American Diabetes Association,2013).

Psychological Factors and Type 2 Diabetes

To what level can diabetic patients' belief systems about illness, perception of social support determine the stress in terms of psychological, interpersonal, and physiological consequences of that illness? This issue was addressed in some studies carried out by Mishra et al. (2004), Awasthi and Mishra (2007, 2008, 2011, 2013). The focus of these studies was mainly on illness beliefs and health-seeking behaviour of women who visited outdoor clinics for routine check up and consultation regarding the management of their type 2 diabetes. None of the patients was subjected to any surgical or otherwise difficult experiences. Beliefs of these patients regarding a number of issues related to illness causation, consequences, and controllability were compared with those of the matched samples of women (non-patients) drawn from the normal population. The role of support system and coping strategies in perceived controllability and consequences of type 2 diabetes was also studied.

The findings broadly suggested that internal (individual, psychosocial) and external (supernatural, environmental) causes of illness coexisted in the belief system of patients. The degree of social support received from families and friends was positively related to physiological and psychological wellbeing of the patients. A high level of social support tended to reduce the severity of the negative psychological, physiological, and

interpersonal consequence of illness. Those indicating a high level of social support also strongly believed that the illness was either in their own control or the doctor's control. A high level of social support reduced the experience of pain associated with the disease, and promoted hope for better outcomes.

These studies revealed that in a long-established society like ours, it is somewhat possible that patients suffering from various health problems hold beliefs about multiple causation, consequences and controllability of illness, which may have different outcomes for people. The belief that patients' own efforts and the efforts of the doctor can control illness seems to bear great promise for community health activities. The role of social support in reducing the experience of severe consequences and pain, and promoting hope among patients also bears a similar promise.

Workplace Stress and Type 2 Diabetes

In today's scenario of workplace burden and demanding situations, it stands obvious to fall prey to stress because working under the competing environment becomes highly demanding on the mind and body of an individual and the individual gets prone to various health risks. A study was conducted wherein a team of scientists, led by Cornelia Huthand Karl-HenzLadwig of the Institute of Epidemiology II at Helmholtz ZentrumMunchen in Germany analysed the data that was collected from employed individuals with age range between 29 and 56 years. The data was collected from over 5300 employed individuals who did not have type-2 diabetes when the study began but over the span of total 13 years 300 out of 5300 were diagnosed with type-2 diabetes. It was further found out that one in every five people wasaffectedby the workplace stress. By the term stress the scientists did not directly point to the job stress only but also to the high demands that were placed on the individuals in the workplace and at the same time no scope for decision making was given which together piled up to high levels of stress(Huth et al., *2014)*.

A study conducted in 2009 also found out the relation between stress and type-2 diabetes. In the paper of the following study the author of the study talked about the linkage between diabetes and prolonged sorrow(according to the 17th century doctors) that is now a day's referred as stress. According to the report another major finding was that the stress can also lead to obesity which again is another risk factor for diabetes type-2 and as a result it poses a more dangerous threat on the body of people who have already been diagnosed with diabetes (Huth, et al., 2014).

Since the beginning of 17thcentury, it has been believed that stress leads to the onset of diabetes as the English physicians have linked diabetes with prolonged sorrow. This linkage set the foundation for further researches in the field of stress and diabetes. As a result various researches have identified workplace stress and family losses as major stressors in life that may directly affect the onset of type-1 and type-2 diabetes. It is also to be kept in mind that not all the researches that are done in this field provide full support for the linkage between stress and diabetes. Although the link between stress and diabetes type-1 has been supported through the effect of stress on the autoimmune system as it was hypothesized by Botazzo et al. (1985) that in genetically predisposed individuals the environmental stressors lead to the destruction of autoimmune destruction of the beta cells.

Cosgrove (2000) said that most of the studies that have been done to look into the linkage and connection between diabetes type-1 and stressful events have been conducted on such a small group that they were devoid of proper control groups. In

respect with the same he conducted a large Swedish study to see the relation between stress and type-1 diabetes. However the results of the study did not support the hypothesis of relation between stress and the onset of type-1 diabetes. Although much cannot be generalised from this study as it included a very wide age range within which numerous life instances might occur that may mask the relation between stressful experiences of an individual and onset of type -1 diabetes (Littorin et al., 2001).Thernlund et al. (1995) has suggested that children who undergo high level of negative stressful events during the first two years of their life and are affected by the negative family environment of daily chaos and also have certain behavioural problems are at great risk of developing type- 1 diabetes.An association of stressful experiences and type-2 diabetes was found in a survey that was conducted by Mooy et al. (2000). The survey was done on glucose intolerance which led to the finding that supported the relation between both stress and diabetes type-2.

Attempts have also been made to explain the physiological links between the experience of stressful events and the onset of diabetes. Bjorntop (1997) has suggested that on one hand the psychological reactions to the stressors of helplessness might lead to certain endocrinal abnormalities like high release of cortisol and low sex steroids which in turn antagonises the action of insulin and on the other hand the increase in visceral adiposity plays a great role in insulin resistance and leading to diabetes.On the basis of numerous researches that have been done in this field no specific generalisations can be made because on one hand the smaller in depth studies show a link between stressful events and diabetes while the on the other hand the larger studies do not give approval to any such link between stress experience and diabetes.

Stress and Diabetes Control

Not to forget that stressful experiences in life does not only influence the onset of diabetes in an individual but also affect the control of diabetes once the individual is the patient of the disease. Keeping in mind the same, various researches have been done in this field too. Various laboratory studies have been conducted to see the effect of numerous stressful situations (for instance a stressful job interview or solving a difficult arithmetic problem) on the level of blood glucose. On the basis of these researches it has been found that these type of stressors can destabilise the blood glucose level for few hours (Goetsch et al.,1993).

In depth investigations have also been done to find out the relationship between the stressful experiences and changes in the glycemic control over time. For this, individuals with type-2 diabetes were interviewed thoroughly about the negative and positive stressors in their lives. They were interviewed through interview schedules and followed up quarterly for over a year with the measures of diabetes control. The results of the investigations showed that negative stress was reported by the people whose glycemic control had deteriorated over time and positive stress was reported by the individuals whose glycemic control had improved over the span of the follow up. However there are several limitations of such studies as they do not take into account the context in which the stress occurs or the context in which the stressful situation is encountered. Not only the context but also various other factors are important like the relationship with the peer group, the fear of the future and other daily life hassles. Before reaching to a particular conclusion regarding the relation between stressful experiences and diabetes control it must also be kept in mind that the relation between these two depends upon various psychosocial factors too. One of the basic psychosocial factors is social support which acts as

a buffering agent during the times of stress. Psychological support is also important as is reported in a meta analysis of randomised control trials (Ismail et al., 2004). Therefore nothing can be ascertained regarding how the various stressors affect the glycemic control and there can be both physiological as well as behavioural pathways between these two.Taking about the behavioural pathways, the studies done in this regard have suggested that the stressful experiences have an impact on the diabetes self care behaviour although different other factors may mediate this relationship.

Stress Management and Diabetes Control

It has been found that stress not only effects the onset and control of diabetes but also interferes with the ability to self- manage diabetes because taking appropriate care of oneself like following a proper meal plan and monitoring the level of glucose regularly becomes a burden and a difficult task when the individual is under stress. Also the management of diabetes in itself becomes a task of stress or a new source of stress. Thus, it really becomes mandatory to control the negative response to stress. Keeping in mind the same we turn towards the various strategies towards the management of stress so that the individuals can by themselves reduce the risk for the onset of diabetes and also remain in a better position to control its serious and harmful consequences by minimising the risk.

The first step towards this is to challenge the source or cause of stress. Although this in itself is a very difficult task to identify the real source of stress and allocate it to a real and correct source and at the same time differentiate and separate the source of stress from the response to the stress. In order to minimise the sources of stress it then becomes very necessary to put order in the life of an individual and this can only be achieved through better time management and various techniques that can easily reduce the daily life hassles that if not tackled properly take the form of big stressors.

Secondly after identifying and working towards the correct source of stress, the response towards the stress should be monitored and changed. In case the individual has a tendency to be reactive and impulsive as response to the stressful situations then the technique of "thought stopping" and"reflective technique" should be adopted without any fail. This would help to prevent the negative consequences like that of anger outburst and impulsive behaviours. Besides with learning the ways to alter the response to stress one must also learn how to induce a more relaxed feeling. For this, learning the Benson and Stuart (1992) relaxation response may prove to be very beneficial.

Thirdly the long term effects of stress should be modified using various strategies. For individuals with diabetes the technique of distraction can prove to be beneficial. If a person finds it really difficult to keep himself away from worries of the work, then the technique of distraction should be adopted with no doubt. Also the individual should be involved in various pleasurable activities, should be motivated to participate in hobby program in order to alleviate stress.

Researches have been done to investigate the effect of stress management on the glycemic control. However recent reports have also suggested that stress management may also affect diabetes and also the treatment of it. Grey et al. (1999; 2000) demonstrated that the adolescents with type-1 diabetes who were taught various coping skills and preventive strategies to combat stress, showed improvements their level of glycemic control and also the quality of life was improved and maintained over time.

Conclusion

In a nutshell it can be said that stressful life experiences has direct bearing on the epidemic illness of diabetes. Stressful experiences in childhood, at workplace, family chaos all together pile up to greater risk of developing and also maintaining the illness of diabetes. Stressful experiences not only effect the onset of diabetes, they also effect the control of it and not to forget that the very feeling of having the disease of diabetes may prove to be stressful in itself and as a result the task of managing and taking additional care due to diabetes may prove to be additional burden and more stressful. Hence it becomes really mandatory to manage the stress and deal with the stressful experiences in an effective way by developing various psychosocial actionplans and strategies. In case of diabetic patients they must develop very realistic goals for self-management and these goals should be specific and achievable too instead of very vague, unrealistic and unachievable ones. The evaluation of these should not focus only on the goals being met but also on the efforts that are being put to reach up to the goal. In order to reduce the risk of diabetes through excessive stress the individuals must also include the thought stopping strategy and reflective technique where they can learn to choose the correct alternative to impulsive and stress aggravating response pattern and as a result they can cope up through the relaxation response by calming down and then acting instead of rapid impulsive action.

In order to minimise the effect of stress producing activities the diabetics should try to distract themselves for a while from the tasks that are the source of stress and may involve themselves in various hobbies, pleasurable activities, yoga, exercise programs and if nothing helps and the stress becomes so severe that it becomes difficult to cope up through the mentioned strategies then the most effective approach can be referring a mental health professional so that the further risks for illness in minimised and quality of life can be maintained.

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