THE ROLE OF PSYCHOSOCIAL FACTORS IN THE AETIOPATHOGENESIS OF DIABETES MELLITUS (MADHUMEHA)

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ABSTRACT
Diabetes Mellitus (Madhumeha) is a lifelong chronic metabolic disease which requires lifestyle management and active patient participation in its management. Psychological well-being is itself an important goal of medical care and psychosocial factors are relevant to nearly all aspects of diabetes management. Lifestyle disorders, such as diabetes, are chronic and require a different yardstick for management. The psychosocial aspects of living with diabetes have been recognized in recent years and this has prompted the establishment of guidelines to ensure that these issues are recognized and properly dealt with by medical practitioners looking after patients with diabetes. This is because it has been realized that psychological disorders in patients negatively impact on their quality of life and ability to handle aspects of their management. This leads to poor glycaemic control and further worsening in quality of life. Ayurveda has specially emphasized the role of some psychological aetiological factors i.e. Krodha (anger), Udvega (anxiety) and Shoka (grief) in the aetiopathogenesis of Prameha. In Charak Samhita, Krodha (anger) is among one of the etiological factors in Patika prameha and Udvega (anxiety) and Shoka (grief) for the Vatika prameha (C. S. Ni. 4/ 24, 36). Hence it can be concluded that psychosocial factors are important modulators in the aetiopathogenesis of Diabetes mellitus (Madhumeha) and optimal diabetes management can be achieved only if holistic approach associated with considerable physical, social and psychological well-being is dealt with. The current article addresses different aspects of this interface.
KEYWORDS: Diabetes mellitus, Madhumeha, Psychosocial factors.

INTRODUCTION

Diabetes Mellitus (Madhumeha) is a lifelong chronic metabolic disease which requires lifestyle management and active patient participation in its management. Psychological well-being is itself an important goal of medical care and psychosocial factors are relevant to nearly all aspects of diabetes management. It has been realized that psychological disorders in patients have a negative impact on their quality of life and ability to handle aspects of their management. This leads to poor glycaemic control and further worsening in quality of life. Dietary restrictions, self-administration of hypodermic medication and urine testings are part of a ritual that involves the daily participation of the individual as well as his use of good judgment in unusual situations. Since the success or failure of diabetic control rests on the patient's ability to put in practice a multitude of requirements, patients with diabetes mellitus are vulnerable to psychological injury. Hence it is vital to consider the patient to be seen as a whole person rather than just as a diabetic. This holistic approach can be achieved only by incorporation of Ayurveda in the management of Diabetes mellitus (Madhumeha).

So, the present review was carried out with the aim of identifying the emotional and psychological factors that play a role in etiopathogenesis of Diabetes mellitus (Madhumeha) which in turn would help the patients to manage diabetes.

RESEARCHES ON BASIC ETIO-PATHOGENESIS OF DIABETES

Researchers have reported that psychological stressors (Manobhitapakara Bhavas) have a great impact on altering defence mechanism and manifestation of DM. A definite relation in between psychological stressors, lipid peroxide and fasting blood sugar (FBS) was also established by the researchers. A similar study ascertained definite role of stress, depression, anxiety, fear etc., psychological stressors in the etio-pathogenesis of diabetes. Researchers have ascertained that an increased rate of catalase activity was observed in stress induced diabetes in albino rats which suggest accelerated cell injury and free radical generation which in turn is a precursor to diabetes. Studies have corroborated a definite role of psychological stress, lifestyle changes, lack of exercise and irregular dietary habits in raising the picture of DM. Substantial evidences now exist to suggest pathogenesis and associated complications of diabetes with unhealthy diet and lifestyles choices, reduced physical activity, over eating, psychological stressors and depressive disorders.
Hence psychotherapy, counselling, anti-stress approaches (Manasa Doshahara karma) are also to be preferred besides drugs to check the vicious pathogenesis of diabetes.

Co-Morbidity of Psychological Disturbances and Diabetes
Diabetes and psychiatric disorders share a bidirectional association; both influencing each other in multiple ways. A diagnosis of diabetes and its subsequent management can potentially be associated with psychological problems. Some of the psychiatric disorders of particular relevance with regard to diabetes include delirium, substance use disorders, depression, anxiety, psychotic illness like schizophrenia, eating disorders. The prevalence of psychiatric disorders other than depression in diabetes has not been extensively studied. There is evidence that anxiety disorders are significantly more common in this group, particularly generalized anxiety disorder and simple phobia. The prevalence of anorexia nervosa and bulimia nervosa in diabetes is unknown, but interest in these disorders remains high because of their potential for adverse effects on glycemic control. Prevalence studies involving these eating disorders have examined very small numbers of subjects were uncontrolled, or varied greatly in their case definition. The relationship between stress and glucose regulation in diabetes has been the subject of considerable study, but findings have been inconsistent. Furthermore antidepressants and antipsychotics may cause metabolic abnormalities. Antidepressants with noradrenergic activity have the highest potential to cause metabolic abnormalities.\[8\]

Co-occurring psychiatric disorders in patients with diabetes are associated with impaired quality of life,\[9\] increased cost of care,\[10\] poor treatment adherence,\[11\] poor glycemia control (evidenced by elevated HbA1c levels),\[12\] increased emergency room visits due to diabetic ketoacidosis,\[13\] higher frequency of hospitalization and higher rate of absenteeism.\[14\] Additionally there is an increase in cost of medical care. Cost of care for non-mental health conditions among patients with co-occurring psychiatric disorders and endocrinal disorders is twofold or even higher (depending on the treatment setting) than the population without co-occurring psychiatric disorders.\[15\]

Besides the various aetiological factors, Ayurveda has specially described some psychological aetiological factors i.e. *Krodha* (anger), *Udvega* (anxiety) and *Shoka* (grief) which play important role in the pathogenesis of *Prameha roga*. In Charaka Samhita, *Krodha* (anger) is among one of the etiological factors in *Paittika prameha* and *Udvega* (anxiety) and *Shoka* (grief) for the *Vatika prameha*\[16\] which leads to derailment of glucose metabolism.
Hence a definite relationship exists between co morbidity of Diabetes and Psychological disorders.

**Cultural Issues Related to Diabetes Mellitus**

Culture is often defined as a learned set of values, beliefs, norms and patterns of behaviour. Very few studies have explored the effect of cultural beliefs and attitudes toward diabetes prevention and care services. It would be important for diabetes care providers to understand cultural determinants in order to provide holistic care for people with diabetes.[17] Moreover it is essential to place individuals and families in an appropriate context for diabetes prevention and care. Understanding the broader cultural context can serve as important background information for effective care for diabetes.[18] Cultural beliefs and traditional practices affect nearly all aspects of the disease, like perception about diabetes, its assessment and diagnosis, care seeking behaviour, expectation from providers and so forth. Moreover, culture may influence diabetes self-management as well. To address these issues in prevention and care services, diabetes providers are expected to bear cultural competencies for assessment and planning culturally appropriate interventions. The problem also lies with suggesting a diet regimen which does not fit well with the way people eat in India. Merely following international or Euro-American ways of eating is not the answer. More creative ways of talking about diet need to be advised. Cultural characteristics such as value systems, beliefs, customs and family patterns may be used as clues for planning culturally appropriate care for diabetes.[19]

**Impact of Diabetes Mellitus on the outlook of Patient’s Life & Family**

It is widely known that patients with diabetes mellitus are at high risk of decreased psychological well-being [20-25] which is already present in about half of the patients at the time of diagnosis [26] This is due to strained coping with changed life routine (such as relationships, work-related and financial issues) [27] right from the time of diagnosis. The need to manage the condition in addition to the psychological demands of meeting commonly experienced challenges faced throughout the life cycle, such as leaving home, marriage, pregnancy, parental concern about the possibility of their children developing the condition all these conditions may have a negative impact on many aspects of life, ranging from relationship with family or friends to psychological health. Hence it is helpful for the health care professional to take time to find out what is going on in the patient's life that may
contribute to difficulties in managing the condition and where appropriate, offer support and suggestions for how these life issues might best be approached.

Development of Diabetes complications and adherence to strict treatment regimes may make the patient feel demoralized or depressed if outcomes are poor. It is vital to ensure that the patient does not feel blamed for these as this could potentially undermine their motivation to comply with all aspects of treatment. Therefore it is not simply enough to educate and instruct the patient on how to manage their condition but support and encouragement are vital if the patient is to feel empowered. In clinic the role of the professional should be one of facilitator rather than expert.

**Psychological Aspects of Diabetes Symptoms**

Patients with diabetes mellitus (DM) need psychological support throughout their life span from the time of diagnosis. The psychological make-up of the patients with DM plays a central role in self-management behaviors. Without patient’s adherence to the effective therapies, there would be persistent sub-optimal control of diseases, increase diabetes-related complications, causing deterioration in quality of life, resulting in increased healthcare utilization and burden on healthcare systems. However, provision of psychosocial support is generally inadequate due to its challenging nature of needs and demands on the healthcare systems. Some descriptions are also provided on willpower, resilience, illness perception and proactive coping in relating execution of new behaviors, coping with future-oriented thinking and influences of illness perception on health-related behaviors.[28]

There are five broad cognitive illness representations which are related to psychological aspects of DM:

1. Identity (the label given to the illness and knowledge of its symptoms)
2. Cause (beliefs about the cause of the illness)
3. Timeline (the perceived duration and course of the illness)
4. Consequences (the perceived short and long term effects of the illness)
5. Control / cure (beliefs about the degree of controllability / curability of the illness)

Despite the widespread prevalence of psychological problems and their negative consequences, the availability of person-centred chronic illness care and psychological support was low for patients with DM. Only 48.8% had received psychological treatment or educational activities to help manage their diabetes.[27]
The Ayurvedic Scholars have the knowledge of Prameha since antiquity. The description as given by Acharya Charaka states that in addition to the intake of food in excess, the some psychological factors such as kama (passion), krodha (anger), lobha (greed), moha (confusion), irshya (envy), hri (bashfulness), shoka (grief), mana (pride), udvega (anxiety), bhaya (fear) etc also affects the body by vitiating the undigested food products. Thus, wholesome food taken even in the right quantity doesn’t get digested properly if the individual is afflicted with disturbed state of psyche (manasa). This improper digestion leads to production of ama. So in anxiety and stress prone individuals the pathogenesis starts from the vitiation of agni leading to amotpatti and that ama when settles in basti (urinary bladder) leads to disease prameha as mentioned in Grahani roga cikitsa. Pragnaparadha is considered to be the root cause of all the diseases. Acharyas have described Pragnaparadha as improper conceiving of knowledge leading to improper activity of buddhi. Due to this a person indulges in nidanas like Asyasukham, Swapnasukham, Dadhi, Guda, etc. which results in manifestation of Prameha. Besides this Pragnaparadha is highlighted to be “Sarvadoshaprakopanam” i.e. vitiator of all the three doshas. Here, a clear cut involvement of psychic factors is depicted in the pathogenesis of the disease. In Prameha also the person falls prey to Pragnaparadha which in turn leads to Asatmyendriya Samyoga (Indulgence of sense organs in improper activities). Additionally if Kala Parinama (Time factor and age factor) is also in support then a definite pathogenesis of disease is established in a person.

Relation of Personality traits and Madhumeha
In addition to psychological variables, personality factors emerge as potential vulnerability factor for adverse health outcomes. Patients with Diabetes are likely to have negative effects such as hypertension, job stress, social isolation (Mudgil, 1992). Research reports revealed that Type-A behaviour measure showed significant relationship to occupational stress and work motivation in relation to age, job level and overall well-being among nursing professionals (Virk, 2001). Hence people with Type A behaviour are prone to suffer from Diabetes. The description of Type A Personality is very much close to Rajasika Prakiriti. It is observed by the previous researchers that the persons having Rajasika prakriti are more prone to develop Prameha. This type of Manasa Prakriti is more susceptible to suffer from Manoabhitapa (mental affictions) due to their feeble, fickle state.
DISCUSSION AND CONCLUSION

Interface of diabetes and psychiatry has fascinated both endocrinologists and mental health professionals for years. Diabetes and psychiatric disorders share a bidirectional association - both influencing each other in multiple ways. In spite of a multifaceted interaction between the two the issue remains largely unstudied in India.

The effect of stress on glucose regulation has been the subject of considerable study. Stress also causes increased production of pituitary hormones, catecholamines, corticosteroids and suppression of insulin release. These actions serve to increase glucose levels in the blood associated with poor glycemic control in diabetic persons. Coping styles marked by avoidance, detachment, or denial may also adversely affect glycemic control in diabetes, as well as compliance with diabetic treatment regimens.[32][33] The description of Ama formation by Sushruta Samhita is attributed to disturbed state of Manas (psyche) which in turn leads to Jatharagni mandya followed by Dhatwagni and Bhutagnimandhya. In anxiety and stress prone individuals the Samprapti starts from the vitiation of Agni leading to Amotpatti and that Ama when settles in Basti leads to Prameha. On the other hand, Ojas is excreted through the urine leading to Ojakshaya. Vagbhata has mentioned symptoms of Ojakshaya like Bibheti (excessive fear), Abhikshna Daurbalya (excessive weakness), Vyathita Indriya, Rukshata, Kshanata etc.[34] This description reflects direct involvement of Manasa in etiopathogenesis of Madhumeha.

Hence while managing the disease following factors is needed to be taken into consideration
1. Psychological state of the patient – Which can be well managed by Medhya Rasayana (Molecular nutrient for mind and Satvavajaya Chikitsa (Ayurvedic Psychological counselling)
2. Correction of Ama – Which can be achieved by Ama paachana and Srotoshodhana chikitsa
3. Correction of Ojo dusti – Which can be achieved by Rasayana Chikitsa
4. Correction of Medodusti – Which can be achieved by Medodusti hara Chikitsa

Interface of diabetes and psychiatry has received little attention in India. As noted by Sridhar there are little published data from India on the coexistence of diabetes and psychiatric illness.[35] A few studies have explored the prevalence of depression and anxiety among patients with diabetes in specific settings only. Psychosocial outcomes including well-being in persons with diabetes have also been studied.[36] There is a need to study these issues in the
Indian context as attitudes and concepts vary across cultures and impact on these interactions. A special emphasis should be placed on prospective studies to elucidate the link between various psychiatric disorders and diabetes. The role of stigma in seeking help for comorbid psychiatric disorders among patients with diabetes requires special attention. The potential role of the family in management of these individuals needs to be tapped fully. This is an area which should be explored specifically in studies as the family structure in the Indian context differs from that in the west.

Another important issue with significant management implications among individuals having both diabetes and psychiatric disorders is that of treatment adherence. Psychological, cognitive, and emotional issues associated with psychiatric disorders make the issue complicated. Individuals with comorbid diabetes and psychiatric illness are more likely to receive poor diabetes care. Poor treatment adherence is seen with both medication use as well as investigations. Self-management is an essential component of diabetes care. The presence of comorbid psychiatric illness can make self-management difficult to implement. It has also been seen that increased healthcare utilization for comorbid psychiatric disorder could improve treatment adherence for diabetes as well. Psychological approaches can help improve the therapeutic adherence in diabetes care. It is important to see patients and care givers as important stake holders in management plan. They should be involved in the decision-making process. The patients should be entrusted with the responsibility of shared decision making.

Hence it can be concluded that psychosocial factors are important modulators in the aetiopathogenesis of diabetes mellitus (Madhumeha) and optimal diabetes management can be achieved only if holistic approach associated with considerable physical, social and psychological well-being is dealt with. Interaction of diabetes and psychiatric disorders is multifaceted and an increase in understanding of the same would help endocrinologist and psychiatrists alike to serve this cohort effectively and comprehensively.

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