Diabetes and psychiatric disorders

The 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. The current article addresses different aspects of this interface. General issues pertaining to the topic would be described first. Subsequently salient features of individual psychiatric disorder would be presented.

Patterns of co-occurrence of diabetes and psychiatric disorders

Comorbidity of diabetes and psychiatric disorders can present in different patterns. First, the two can present as independent conditions with no apparent direct connection. In such a scenario both are outcome of independent and parallel pathogenic pathways. Second, the course of diabetes can be complicated by emergence of psychiatric disorders. In such cases diabetes contributes to the pathogenesis of psychiatric disorders. Various biological and psychological factors mediate the emergence of psychiatric disorders in such context. Third, certain psychiatric disorders like depression and schizophrenia act as significant independent risk factors for development of diabetes. Fourth, there could be an overlap between the clinical presentation of hypoglycemic and ketoacidosis episodes and conditions such as panic attacks. Fifth, impaired glucose tolerance and diabetes could emerge as a side effect of the medications used for psychiatric disorders. Treatment of psychiatric disorders could influence diabetes care in other ways also as discussed in subsequent sections.

Implications of co-occurrence of diabetes and psychiatric disorders

Co-occurring psychiatric disorders in patients with diabetes are associated with impaired quality of life, increased cost of care, poor treatment adherence, poor glycemia control (evidenced by elevated HbA1c levels), increased emergency room visits due to diabetic ketoacidosis, higher frequency of hospitalization, and higher rate of absenteeism. 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.

Delirium

Delirium in diabetes could be a manifestation of hypoglycemic episodes or diabetic ketoacidosis. Delirium represents the severe end of the spectrum of clinical manifestation of these phases. Patients with diabetes suffering from co-morbid psychiatric disorders are more likely to experience hypoglycemic delirium. Because of use of overlapping terminology in the literature it is difficult to estimate the exact prevalence of delirium in diabetes based on current nosological systems. However, episodes of hypoglycemia and diabetic are not uncommon in diabetes and consequently delirium is also not an infrequent occurrence. Delirium is associated with various adverse outcomes including increased hospital stay, increased cognitive and functional deterioration, morbidity and mortality.

Early identification is crucial to the outcome of delirium. The main stay of treatment is correction of the underlying cause with supportive care. Low-dose dopaminergic antagonists

(also known as typical antipsychotics) could be used for control of behavioral disturbance. It is recommended to use high potency medications such as haloperidol. Since the clinical picture can vary rapidly it is important to assess the patient at frequent intervals and modify the treatment plan accordingly.

Substance abuse: tobacco

Tobacco can be used in smoking (cigarettes, biri, hooka, cigar) and smokeless forms (gutkha, tobacco powder, khaini, snuff). The prevalence of smoking among those having diabetes has been found to be comparable to that of the general population in studies from western settings.

Cigarette smoking is an independent, modifiable risk factor for development of diabetes. It is associated with increased risk of diabetes in a dose-response manner. Although evidence is less compelling but smokeless tobacco use has also been associated with increased risk of development of type 2 diabetes.

Cigarette smoking increases this risk for diabetic nephropathy, retinopathy, and neuropathy (strongest association in type 1 diabetes) as well as that of macrovascular complications, coronary heart disease (CHD), stroke, and peripheral vascular disease (strongest association in type 2 diabetes). Severe periodontal conditions and oral symptoms are more common among those diabetics who chew gutkha.

The proposed hypotheses on the role of smoking in causation of diabetes include smoking-induced hyperglycemia, hyperinsulinemia, and elevated blood pressure; smoking induced impaired endothelial function; pro-diabetogenic action of components of tobacco smoke (e.g., cadmium).

In diabetes care, smoking cessation is of utmost importance to facilitate glycemia control and limit the development of diabetic complications. However smoking (tobacco) cessation is a challenging job, more so in those having diabetes. Early smoking cessation reduces the risk of development of type 2 diabetes to the nonsmoker level. Smoking cessation is an effective intervention in the early course of microvascular and macrovascular complications. Smoking cessation also reduces the risk of coronary heart disease and mortality among these patients.

The clinicians must be prepared for the possible weight gain and increased risk of type 2 diabetes following smoking cessations. However, these effects are either transitory or could be easily managed with life style modifications and behavioral interventions. Hence, when smokers quit, they should be advised on weight management and be monitored for diabetes in the years soon after quitting. Additionally since tobacco smoke is an inducer of various isoforms of the cytochrome P450 system, it is recommended to monitor the possible change in dose requirement of various oral hypoglycemic agents that are metabolized by the enzyme system.

Substance abuse: alcohol

Prevalence of alcohol use in diabetic population has been reported to be around 50--60% in epidemiological surveys and treatment seeking population. The relation between alcohol consumption and diabetes remains controversial. While consumption in higher amounts is associated with an increased risk of type 2 diabetes, consumption in low to moderate amounts

has been found to be protective in some studies. Glucose intolerance can develop in alcoholics due to alcohol induced acute pancreatitits as well.

One of the commonest and serious concerns associated with use of alcohol in diabetes is emergence of hypoglycemia. It could be alcohol-induced fasting hypoglycemia, potentiation of drug-induced hypoglycemia, or reactive hypoglycemia in susceptible individuals. Additionally alcohol consumption may impair individual's ability to recognize emergence of such episode and intervene appropriately. Heavy alcohol consumption can precipitate diabetic ketoacidosis. Being a cause of peripheral neuropathy and retinopathy independently, co-occurring diabetes and alcohol use can have synergistic effect for these complications. It has been seen that alcohol consumption is inversely associated with adherence to diabetes self-care behaviors.

Concomitant use of chlorpropamide (a sulfonylurea agent) and alcohol could lead to disulfiram-ethanol type of reaction. It is characterized by facial flushing, warmth, headache, nausea, vomiting, sweating, or thirst within minutes of consuming alcohol. Also, alcohol consumption may lead to excessive weight gain and elevated glucose levels. Alcohol can also alter the metabolism of oral hypoglycemic agents. Metformin is contraindicated in those actively using alcohol for the fear of lactic acidosis. Additionally alcohol induced hepatopathy requires a dose reduction for oral hypoglycemics metabolized in liver.

Similar to tobacco use all patients with diabetes should be screened for alcohol use. Those who have not yet started should be advised to continue to be sober. Those with problematic alcohol use should be advised to practice abstinence or at least use in moderation. Brief screening tools available to identify individuals with problem drinking. One such tool is a CAGE questionnaire which is an acronym for four simple questions aimed at screening problem drinking.

Diabetics having problem drinking (binge drinking, alcohol abuse, or alcohol dependence) should be offered individualized comprehensive interventions. Some of the commonly used medications in management of alcohol dependence include disulfiram, acamprosate, naltrexone, and topiramate.

Additionally, such individuals can be offered nonpharmacological interventions such as brief intervention, motivation enhancement therapy, self-help group such as alcohol anonymous and relapse prevention.

Mood disorders

Mood disorders include depressive disorders, dysthymia, and bipolar affective disorders (BPAD). Co-occurrence of diabetes and depression has been established in clinical as well as general population studies. This co-occurrence is associated with increased impairment as well as mortality. Risk of developing depression is 50-100% higher among patients with diabetes compared to that among the general population. The prevalence of diabetes among BPAD patients has been found to be increased (in hospital based studies) or equal (in epidemiological surveys) to that observed in the general population.

Emergence of depression in diabetes is associated with increased complications, mortality rates, and healthcare costs.

Depression and diabetes share a bidirectional causal association. Depression has been postulated to play a causal role in emergence of diabetes. A recent meta-analysis has reported that depressed

individuals have a 60% increased risk of developing diabetes. A specific association has been found between risk of developing diabetes and nonsevere depression, persistent depression, and untreated depression.

Nonpharmacological interventions such as cognitive behavior therapy and interpersonal therapy can be used either alone or in combination with pharmacotherapies.

Anxiety disorders

The prevalence of anxiety disorders among patients with diabetes is considerably higher compared to the general population. Anxiety symptoms have been found to be significant risk factors for development of diabetes. Negative correlations have been observed between prevalence of anxiety disorders and levels of HbA1c.

The prevalence rate of generalized anxiety disorder (GAD) has been found to be around three times higher than that reported in the general population. However, rates of panic disorder, obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD), and agoraphobia have been found to be within the range of those reported in community studies.

Relation of anxiety disorders and diabetes has not been explored as systematically and extensively as that of depression and diabetes. Anxiety in the context of diabetes has been studied mostly in association with depression.

Needle and injection phobia and phobia of hypoglycemic episode are two conditions associated with diabetes. Patients with these conditions are likely to miss glucose monitoring or even insulin dose administration in severe cases. Also they might maintain a state of chronic hyperglycemia for the fear of developing a hypoglycemic episode.

Clinical features such as sweating, anxiety, tremor, tachycardia, and confusion are shared by both hypoglycemic episodes and anxiety disorders. This could present a diagnostic challenge especially among individuals having phobia of hypoglycemic episodes. Chronically anxious individuals may be more likely either to fail to perceive the initial warning signs of hypoglycemia or to confuse these with anxiety.

Medications used in management of anxiety disorders such as SSRIs, benzodiazepines, and beta adrenergic blockers could potentially interfere with glycemia control and normal physiological warning signs of an impending hypoglycemic episode.

Schizophrenia and other psychotic disorders

Association of psychotic disorders (including schizophrenia) and diabetes is well established. Overall risk of type 2 diabetes in people with schizophrenia is between two and four times that in the general population. Family history of type 2 diabetes is significantly higher even among the first-degree relatives of patients of schizophrenia. Similarly, a positive family history may increase the risk of developing diabetes in individuals with schizophrenia up to threefold. It has been shown that people with diabetes and schizophrenia have higher mortality rates than individuals with diabetes alone. Additionally, the presence of type 2 diabetes is associated with increased mortality risk in patients with schizophrenia.

Schizophrenia is associated with impaired glucose tolerance and insulin resistance. The prevalence of impaired glucose tolerance in people with schizophrenia may be as high as 30%, depending upon age. The likely contributors to increased risk of diabetes in schizophrenia include both genetic and environmental factors. Physical inactivity, poor diet, poor healthcare, and treatment with antipsychotic medications are some of these factors. There are some preliminary reports that suggest that schizophrenia is an independent risk factor for diabetes.[58] Moreover schizophrenia is associated with a treatment nonadherence rate to the tune of 50%. This has significant management implications for such individuals.

The information presented here is based primarily on the literature from the western settings. 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. 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. 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.

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.

Dr Shahjada Selim
Assistant Professor
Department of Endocrinology
Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh
Cell: +880 1919000022
Chamber

Comfort Doctors' Chamber 165-166 Green Road, Dhaka Mobile: 01731956033, 01552468377, **01919000022**
Email: selimshahjada@gmail.com