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A REVIEW OF SOCIOLOGICAL FACTORS ASSOCIATED WITH DIABETES MELLITUS

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ABSTRACT

Diabetes Mellitus is not a single disease entity but rather a group of metabolic disorders sharing the common underlying feature of hyperglycemia. This review paper takes a look at the major sociological factors associated with increased blood glucose levels and its control. Among these factors include the socioeconomic status of individuals, their ethnicity, sex and religion. Other sociological factors mentioned in this paper are people's lifestyle, obesity, consumption of alcohol, genetics, marital status, health education and age. Genetics is known to be a major factor in diabetes mellitus as many people with diabetes mellitus tend to have family members especially parents and siblings with the disorder. Socioeconomic status also plays a major role as people in the lower socioeconomic status tend to have diabetes more than those in the higher socioeconomic status. Age is also known to be a factor in Type 2 Diabetes as most people with this type of diabetes tend to show symptoms from the age of 40 and above. Other sociological factors mentioned are discussed in detail

1.0 INTRODUCTION

Diabetes mellitus is a group of metabolic diseases in which a person has high blood sugar, either because the pancreas does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger). Diabetes mellitus is a chronic disease which causes serious health complications including renal (kidney) failure, heart disease, stroke, and blindness[1]. Some of the ocular effects of diabetes include diabetic retinopathy, diabetic macular edema, diabetic papillopathy and diabetic cataract. Glaucoma is also associated with diabetes mellitus[2].

Blood glucose values are normally maintained in a very narrow range, usually 70 to 120mg/dl [3]. The diagnosis of diabetes is established by noting elevation of blood glucose by any of the three criteria[4]:

1. A random glucose > 200mg/dl, with classical signs and symptoms.
2. A fasting glucose > 126mg/dl on

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more than one occasion

3. An abnormal oral glucose tolerance test (OGTT), in which the glucose is > 200mg/dl 2 hours after a standard carbohydrate load.

The vast majority of cases of diabetes fall into one of two broad classes: *Type 1 diabetes* characterized by an absolute deficiency of insulin caused by pancreatic β-cell destruction. It accounts for approximately 10% of all cases. *Type 2 diabetes* is caused by a combination of peripheral resistance to insulin action and an inadequate secretory response by the pancreatic β-cells. Approximately 80% to 90% of patients have type 2 diabetes.

The major sociological factors affecting diabetes mellitus include; Socioeconomic status, Health Education, and socio-cultural statuses. Others include; Religion, Ethnicity, Family, Age, Physical attributes, Education, Locality or location, Life partner and Children.

2.0 SOME SOCIOLOGICAL FACTORS ASSOCIATED WITH DIABETES MELLITUS

2.1 Socioeconomic Status

Type II diabetes was found to disproportionately affect socio-economic status (SES). The main factor contributing to Type II mellitus in lower status are nutrition, education and physical inactivity. The socially and economically disadvantaged are also at elevated risk for diabetes[5]. In addition, whereas the majority of individuals with type 2 diabetes are employed, a sizeable proportion are unemployed. Among adults aged 45 to 64 years, for example, 49% of diabetics are unemployed, compared with only 28% of non-diabetics[6].

Socioeconomic inequalities in health have been attributed to a variety of mechanisms that may act as intermediate risk factors for diabetes. These include poor nutrition, overweight, increased rates of poor health behaviors such as smoking and alcohol consumption, stress, and limited access to health care, particularly in middle age when many individuals are at highest risk for developing diabetes[7]. Access to adequate health care plays an even stronger role in controlling diabetes, preventing the development of complications, and avoiding diabetes-related mortality. Low socioeconomic status may also influence the development of diabetes as a result of inadequate maternal nutrition during and even prior to pregnancy[6].

2.2 Ethnicity

Diagnosed diabetes is present in about 7% of all adults 45 years and older; however, the rates vary substantially by ethnicity. Data from the Third National Health and Nutrition Examination Survey and the Hispanic Health and Nutrition Examination Survey indicate that among adults aged 40 to 74 years, the prevalence of diagnosed diabetes is about 7% for non-Hispanic Whites, 12% for African Americans, and 14% for both Mexican Americans and Puerto Ricans.2,12 Among the various Asian American and Pacific Islander groups, the rates of diabetes vary substantially but can be as high as 15% to 20%.11 The highest rates are experienced by Native American tribes in the Southwest, with an estimated prevalence of more than 37%.13 Indeed, the highest prevalence of diabetes in the world (50%) is experienced by the Pima Indians of Arizona[8].

Diabetes is often undiagnosed in the adult population, because type 2 diabetes is generally asymptomatic in its early stages and without regular screening goes undetected. The prevalence of undiagnosed diabetes has been estimated to be about 6% for non-Hispanic Whites, 7% for African Americans, 10% for Mexican Americans, 12% for Puerto Ricans, and as high as 15% for Native Americans. These large percentages of undiagnosed diabetes show not only that the burden of diabetes is much greater than is indicated by the statistics for diagnosed disease but also that the unrecognized burden is

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greatest among the non-White culturally diverse groups[9].

It is significant that non-White populations not only experience higher prevalence of type 2 diabetes but also suffer from more frequent complications and greater disease severity. Studies of older adults with diabetes have shown that both Mexican Americans and African Americans experience a greater burden from diabetes than do older non-Hispanic Whites. This is particularly evident with regard to mortality resulting from diabetes. Overall age-adjusted death rates from diabetes are about 10% for non-Hispanic Whites, 20% for Hispanic Americans, and 30% for African Americans and Native Americans. These differences are even more apparent when one compares the rates of diabetes across the older ages. Among non-Hispanic Whites, the prevalence of diabetes is about 10% both for adults aged 65 to 74 and for those 75 years and older. In contrast, the rate of diabetes among African Americans drops from 20% among adults aged 65 to 74 years to only 14% among those 75 and older. Similarly, the rate of diabetes among older Mexican Americans drops from 25% among adults aged 65 to 74 years to 18% among those 75 to 84 years to only 12% among those 85 years or older. These decreasing prevalence rates reflect increased mortality among Africans[9].

2.3 Sex

It is thought that much of this difference between the sexes results from varying rates of obesity, physical activity, and hormone action among women. In addition, certain sociocultural factors, such as the role that women play in the family, may affect women's vulnerability to diabetes. Women are often the keepers of culture, the family members who pass on cultural practices, such as what foods are served for holiday celebrations or what activities family members are encouraged to engage in. This responsibility to maintain cultural practices and pass them on to younger generations can make it difficult for a mother or grandmother to successfully make lifestyle changes[10]. Women also suffer from gestational diabetes, or glucose intolerance that begins during pregnancy. Gestational diabetes complicates about 5% of all pregnancies, but the rate of occurrence can range up to 14% depending on the population subgroup. When left untreated, gestational diabetes harms both the mother and infant, often resulting in chronic hypertension as well as perinatal morbidity and mortality. Gestational diabetes is most likely to occur among women older than 25 years, those who are obese, those with a family history of diabetes, and those who are members of the ethnic groups at higher risk for diabetes in general—African Americans, Native Americans, Mexican Americans, Asian Americans, and Pacific Islanders. Although most women with gestational diabetes regain their normal health in the months following delivery, they remain at elevated risk for developing type 2 diabetes later in adulthood. Only about 5% of women with gestational diabetes develop type 2 diabetes within 6 months of delivery; however, 40% to 50% develop diabetes after 15 years, particularly among non-White women[10]. Many of the risk factors for diabetes have a greater impact among women than among men.

2.4 Religion

Religious activity has been defined as the degree of participation in and adherence to the teaching and the organized activity of a particular religion. Religious belief on the other hand, is the fundamental belief system that could influence our ideas, values in life and ways of living. Many patients recognize the importance of religion in their health care management. Specific religious observance e.g. Ramadan and Specific food avoidance may have potential adverse effects on diabetes control. Many religion requires a form of food avoidance or fast as part of their

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observance i.e. fundamental Christian sects, Sikhism, Hinduism, Islam, Judaism, etc. For many, the diabetes conditions would be grounds for exemption but if a patient still wants to fast, advice or timing and dose of medications may be required to prevent blood glucose level. People with diabetes can be exempted but many still insist on full observance. Safety is further compromised if patients also insist on avoidance of blood glucose monitoring during daylight hours. The impact of large amount of fatty acids and sugar food when the daily fast is broken also needed to considered issues need to be observed before fasting. Since the beginning of time, dietary practices have been incorporated into the religious practices of people around the world. Some religious sect abstain or are forbidden from consuming certain food and drinks, others restrict foods and drinks during their holy days, while others associates dietary and food preparation practices with rituals of the faith.

Some studies have shown that more religious people had lower pressure, less hypertension, more compliance in treatment and follow-up and lower utilization of healthcare. A study in Leeds, UK, showed that kashmiri moslem men with diabetes mellitus had poor diabetes control because their overall attitude was to enjoy life and leave the rest to Allah[11]. It is important for primary healthcare physicians to understand potential effect of religion and religiosity on glycaemic control to facilitate care in these patients

2.5 Lifestyle

The risk of developing type 2 diabetes also increases with body weight and sedentary lifestyle. The majority of type 2 diabetics are obese and physically inactive. More than 45% of adults with type 2 diabetes have a body mass index of at least 30[7]. Obesity itself causes some level of insulin resistance, and even many diabetics who are not obese have an increased percentage of abdominal fat. This is a particular problem for many non-White adults. Lifestyle factors that are related to the development of diabetes include smoking, alcohol consumption, poor diet, and, most important, inactivity[12]. Inadequate physical activity or exercise is well recognized as a risk factor for diabetes. In addition to contributing to the development of obesity, a sedentary lifestyle worsens insulin sensitivity and results in elevated blood glucose levels. Exercise not only improves glycemic control among diabetics; it can also help to prevent many of the complications of the disease, including cardiovascular disease, hypertension, and hyperlipidemia[13]. Women are at greater risk for inactivity, particularly as they age. African American and Mexican American women are also more likely than non-Hispanic White women to be physically inactive[9].

2.6 Obesity

Obesity is also more of a problem for women than for men. For adults 25 years and older, the prevalence of obesity is 21% among men and 27% among women. Among the non-White culturally diverse groups, the prevalence of obesity is 13% higher among African American women than among African American men and 18% higher among Mexican American women than among Mexican American men. Obesity is also strongly related to a striking new epidemic of juvenile onset of type 2 diabetes, particularly among non-White culturally diverse groups. Type 2 diabetes has generally been diagnosed in adults 45 years or older; however, it is being seen increasingly in younger adults and children, a direct result of increasing rates of obesity and physical inactivity[14]. Over nutrition in many countries has led to an epidemic of type 2 diabetes. Newly diagnosed type 2 diabetics tend to have one thing in common: obesity. Exactly how diet and obesity trigger diabetes has long been the subject of intense scientific research.

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2.7 Heredity

First degree relatives have a higher risk of developing Type 1 diabetes (T1D) than unrelated individuals from the general population. These data suggest that genetic factors are involved with the development of the disease. At present, there is evidence that more than 20 regions of the genome may be involved in genetic susceptibility to T1D. It has long been known that Type 2 diabetes (T2D) is, in part, inherited. Family studies have revealed that first degree relatives of individuals with T2D are about 3 times more likely to develop the disease than individuals without a positive family history of the disease. It has also been shown that concordance rates for monozygotic twins, which have ranged from 60-90%, are significantly higher than those for dizygotic twins. Thus, it is clear that T2D has a strong genetic component[15]. One approach that is used to identify disease susceptibility genes is based on the identification of candidate genes. Candidate genes are selected because they are thought to be involved in pancreatic β cell function, insulin action / glucose metabolism, or other metabolic conditions that increase T2D risk (e.g., energy intake / expenditure, lipid metabolism). To date, more than 50 candidate genes for T2D have been studied in various populations worldwide. However, results for essentially all candidate genes have been conflicting. Possible explanations for the divergent findings include small sample sizes, differences in T2D susceptibility across ethnic groups, variation in environmental exposures, and gene-environmental interactions[15].

2.8 Alcohol

Alcohol is processed in the body very similarly to the way fat is processed, and alcohol provides almost as many calories[16]. Therefore, drinking alcohol in people with diabetes can cause your blood sugar to rise. While moderate amounts of alcohol can cause blood sugar to rise, excess alcohol can actually decrease your blood sugar level sometimes causing it to drop into dangerous levels. Beer and sweet wine contain carbohydrates and may raise blood sugar. Alcohol stimulates appetite, which can cause you to overeat and may affect your blood sugar control. Alcohol can also interfere with the positive effects of oral diabetes medicines or insulin[16,17].

2.9 Age

The prevalence of diabetes rises steeply with age[1]. The diagnosis of diabetes may be delayed in older people, with symptoms of diabetes being wrongly attributed to ageing. Older people may experience discrimination in the degree of active management offered compared with younger people. Older people with complex needs require multidisciplinary care, which is well co-ordinated across primary, secondary and residential care and social services. Given the relatively high use of hospital services by older people, hospitals can offer an effective intervention point for earlier diagnosis and better management of diabetes in older people. Information, education and support should be provided for older people to help them to manage their diabetes. A significant proportion of older people with diabetes in residential and nursing care will have diabetes.

2.10 Health Education

Increased patient educating is something in which health plans, physicians and diabetes educators should all have a vested interest in helping members to make the behavioral changes that can lead to better health outcomes in a mission and in commitment. The diabetes epidemic gives one an overview of the demographic and socio-economic aspects of the Type II diabetes. It is believed that the suffering and economic burden of this disease can be reduced by training persons with diabetes extensively in proper self-care and that diabetes will eventually become a model for other chronic

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diseases in demonstrating the cost effectiveness of preventive intervention. Globally, self-management education is recognized as an important component for the management of Type II diabetes[18,19].

2.11 Marital Status

Having Type II diabetes changes life and can certainly affect relationship, whether dating or married. Diabetes management requires a lot of attention and focus which may be hard for a partner unfamiliar with the disease to understand. When one is not careful about managing the disease, the partner may also be affected, a recent study of people whose partner had type II diabetes found that those who tried to exert control over their partner's dietary behave felt particularly stressed and burdened[20]. Not only is the emotional aspect of diabetes a real roller coaster but there is also a physical impact on sexual function, the emotional strain of dealing will diabetes can cause stress and anxiety as well as communication difficulties that can lead to sexual dysfunction in relationship.

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