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Socio-economic implications of diabetes mellitus in developing countries

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Abstract

Keywords

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Diabetes mellitus is a global health problem due to its increasing prevalence and associated risk of devastating complications which increase its morbidity and mortality rates together with the high cost of treatment which has become of greater concern to patients, families and the government. The work assessed a range of studies focusing on epidemiological studies and various aspects of economic and social impact and treatment in different contents thereby exposing the link between low productivity, gross domestic product, and economic standard of a country. And what a country stands to gain when the government works together with the health care professional in awareness creation, risk factor reduction hence prevalence reduction and effective management of the patients already diagnosed of this disease.

Introduction

The global burden of diabetes mellitus is enormous and glaring, the impact on health and economy is substantial, yet the diseases is assuming an epidemic proportion especially in developing countries thereby compelling the government to pay more attention to its impact as thousands of people with the disease run the risk of dying young.

Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemic resulting from defects in insulin secretions, insulin action or both. The chronic hyperglycemia is associated with long term damage dysfunction, and failure of various organs, especially the eyes, kidney, nerves, heart and blood vessels (ADA, 2004), thus covering a wide range of heterogeneous disease. Type 1 diabetes mellitus results from the body failure to produce insulin, and this can also be called insulin-dependent diabetes mellitus or juvenile diabetes. The type 2 diabetes results from insulin resistance, a condition in which the cells fail to use insulin properly, this is sometimes combined with absolute insulin deficiency. This type can also be called non-insulin –

dependent diabetes mellitus or adult -onset diabetes. Other forms include gestational diabetes which occurs during pregnancy, when a pregnant woman without a previous diagnosis of diabetes developing a high blood glucose level. It may precede development of type 2 diabetes.

The complications of diabetes include hypoglycemia, diabetic ketoacidosis, or non ketotic hyperosmolar coma, cardiovascular disease, chronic renal failure and diabetic retinopathy.

Diabetes has become the world's most threatening epidemic which is beginning to submerge the developing world with its target population being people within the ages 40-70 years (Aspray and unwin, 2001; Haque et al., 2005). It has been viewed by some public health experts as new lifestyle, imported dietary practices, and globalization which takes its root in the developing world, including Africa, as it is today. The potential severity of diabetes is such that some epidemiologists predict will surpass the ravages of HIV and

AIDS in the near future (Mario and sridevi, 2008). It has been estimated that the global prevalence of diabetes mellitus as of 2012 was 346million people (Ekpeyoung et al., 2012) and will reach 380 million by the year 2025 with the developing countries being the major contributors to the increase (king, 1998). Shortage of medicine and their high cost are key indicators of economic capabilities of health care system in any given country, as the inaccessibility and shortage of medicines in the developing countries have contributed to the increase morbidity and mortality rates in these regions (Mclarty et al.,1993).

In a study, Beran et al.(2005) attributed increased risk of misdiagnosis and failure in the detection of diabetes in Mozambique and Zambia as lack of tools and infrastructure along with inadequate training of health workers. The epidemic proportion and complications associated with diabetes mellitus which affects a person's health related quality of life, ability to function and to desire satisfaction doing so (sigurdard Otter et al., 2009) and cost of its management have a tremendous socio - economic impact on the patients and the countries concerned.

DIABETES MELLITUS

This is a group of metabolic diseases associated with hyperglycemic, either from the body's failure to produce insulin or the failure of the cells to respond to the insulin produced .

The two major types of diabetes mellitus, type 1 or insulin dependent diabetes mellitus, also called juvenile diabetes, type 2 or non-insulin dependent diabetes mellitus also called adult - onset diabetes. Other forms include gestational diabetes, congenital diabetes which is due to genetic defects of insulin secretion, cystic fibrosis - related diabetes, steroid diabetes induced by high doses of glucocorticoids and several forms of monogenic diabetes. Majority of the gestational diabetes are known to resolve after delivery (Lawrence et al., 2008) clinical features of diabetes include hyperglycemia - absolute or relative Insulin deficiency leading to deficient utilization of glucose and excessive glycogenolysis and gluconeogenesis (Nwanjo, 2009).

Glycosuria when plasma glucose concentration exceeds the renal threshold, polyuria -when high urinary glucose produces an osmotic diuresis with frequent thirst for urination, polydipsia- caused by cerebral cellular dehydration resulting from hypersomolality secondary to frequent urination. This is increase thirst for water intake (Nwanjo ,2009), Dry skin- arising due partly to dehydration or water loss from the system. Others are blurry vision, hunger, exhaustion and slow recovery from injuries.

Diabetes presents with complications when mismanaged and these include, hypoglycemia, diabetic ketoacidosis, non ketotic hypersomolar coma. And the long term complications are cardiovascular disease, chronic renal failure, and diabetic retinopathy

PREVALENCE OF DIABETES MELLITUS IN SOME DEVELOPING COUNTRIES

Developing countries like the rest of the world are experiencing a serious increase in the prevalence of diabetes (WHO, 2004). It is estimated that people living with diabetes mellitus in china is 90 million and expected to rise to 129.7 million people by the year 2030. India has about 98 million people currently with the disease, that is why she is called the diabetes capital of the world (Victoria et al., 2011).In 2010, 121 million people were estimated to be living with diabetes in Africa and this is projected to increase to 23.9 million by 2030, of the total number, 0.6% was recorded in Uganda, 12% Kenya, 0.7% was recorded in Cameroon, Ghana Guinea, Nigeria, south Africa and less greater than 10% was recorded in Zimbabwe. In Nigeria it was estimated that about 2.4 million people die annually from diabetes and which is expected to rise by 52% in 2015 ie Smillion people dying annually from the disease, 5% increase in childhood obesity, 3% increase in adolescent obesity, 40% increase in overweight income and 39% increase in overweight women. The increase in the prevalence of diabetes in the high developing countries can be worsened by the high prevalence of HIV/AIDS, as the antiretroviral drugs affect insulin sensitivity and increase development of obesity.

It is estimated that the increase prevalence of diabetes mellitus in developing countries will go through 170% increase between 1995 and 2025 (king, 1998). The progressive increase in the prevalence is associated with life style changes, overweight and obesity, physical inactivity, alcohol consumption, poor dietary habit and cigarette smoking, factors that are potentially modifiable .This has be made possible because the traditional life style and dietary patterns that have sustained people over generations are disappearing due to urbanization and westernization.

PREVALENCE OF DIABETES COMPLICATION

The recorded prevalence of retinopathy ranged from 22% in Kenya, 63% in south Africa neuropathy ranged from 27% in Cameroon, 66% in Sudan.

Prevalence of microalbuminuris ranged from 10% in Tanzania, 83% in Nigeria. Ketoacidosis was 50%. Tanzania and Kenya Sub-saharan Africa in general, 4.5 million people have eye complications, 2.23 million with kidney disease, 907,500 - cardiovascular disease, 423,500 - blindness, 399,300 - cerebrovascular disease and 169, 400- amputation from foot ulcer.

SOCIO ECONOMIC IMPACT OF DIABETES ON DEVELOPING COUNTRIES

The socio economic burden of diabetes is increasing as the epidemic grows by the day, it drains a significant percentage of the health budget by cost towards direct diabetes care and diabetes related disabilities.

The complications associated with diabetes account for 60% of diabetes related direct health care cost and almost 80-90% of indirect cost {Gruber et al., 1997}.

Globally, annual direct care cost of diabetes for people aged 20-79 years currently is in the range of 153 to 286 billion dollars and expected to rise between 213 and 396 billion by 2025 accounting up to 40% of total health care spending in developing countries (WHO, 2003).

The largest increase in the diabetes population in developing countries are projected to be in the most economic productive age group (King, 1998). And this affects therefore, not only the social and economic well being of the patient and families but also their countries (Mohan et al., 2004).

SOCIAL IMPACT OF DIABETES MELLITUS

Managing one's self is the number one factor in the effective treatment of diabetes, for adolescent with type 1 diabetes, the motivation to avoid feeling sick seem significant to promote self management. Also for children, adolescent and adult with type 2 diabetes, being able to manage their social lives and activities go a long way to effective treatment of the disease
Low self esteem.

This is normally seen among young children, where their parent, teachers and peers treat them differently because of their health challenge . And because of the awareness of their health challenge and special treatment given to them, may find it difficult to socialize especially outside their homes.

Depression: this is the fastest killer of any human-being having any form of challenge especially health wise. For instance in obese people, they experience social isolation from peers, they are not normally freely invited to social functions and making the matter worse, may find it difficult to talk in public because they are always conscious of their size and feel different from other of their peers. Consequently they prefer staying indoors to be ridiculed by peers, and a sedentary lifestyle worsens obesity, in the case of amputated limbs, apart from psychological trauma faced, this people automatically lose their jobs also because nobody wants to employ a person with physical incapacitation. They become impoverished as a result, and their disease management becomes a mirage. This amputation is associated with remarkable emotional disturbances, insomnia, erosion of self-esteem, physical handicap and immobility. And this may have spillover effect on their families.

Reduced life expectancy: diabetes dramatically reduce life expectancy when blood glucose, blood pressure and lipid levels are not aggressively controlled. Disability and reduced life expectancy has always been in progressive increase amongst diabetic patients from third world countries.

Quality of life: this is defined as people's emotion, social and physical well-being and their ability to function - the ordinary task of living (valentine et al., 2010). It is also the degree to which person enjoys the important possibilities of her/his life.

It can also be said to be individual perception of their position in life in the context of the culture and value system in which they live and in relation of their goals, expectations, standards and concerns. Health related quality of life are those aspects of life that improves when treatment option is successful and these include; functional status, mental health and emotional wellbeing, social engagement and symptom state.

Social recognition: this is normally observed among young adults, because they want to always be recognized and identified with their peers, lie about their health conditions. This prevent them from keeping away from things they ought not to eat especially in social functions thereby effecting adversely self management and paving way for complications.

ECONOMIC IMPACT OF DIABETES ON DEVELOPING COUNTRIES

Diabetes is an expensive disease especially when the cost of complication including the many disease where diabetes in an underlying causal factor, is considered With the limited national finding especially in developing countries, individuals, parents and families may have to spend significant proportion of their incomes on treatment for diabetes, a level of expenditure that may not be sustainable or affordable.

Diabetes affects people of productive age group like HIV infection, thereby reducing the economic strength of this group through disease and disability, which affects not only the sufferer, but their household and national economy. This negatively impact economic development, and in turn the health budget (Victoria et al., 2011). Between 2005 and 2015, the world health organization predicts net losses in national income from diabetes and cardiovascular disease of 557 billion dollars in china, 303 billion in Russia, 336 billion dollar in India, 49 billion in Brazil, 2.5billion dollars in Tanzania and 8 billion dollars in Nigeria (WHO,2003). Also 8.3 billion dollars in Pakistan.

The current cost burden on individuals or their families for the treatment and management of diabetes and its complications have been estimated to be 11,252 dollars per person annually (Ayesha and Kasushik, 2010) of which 91.2% is due to the complication costs.

DIABETES AND GROSS DOMESTIC PRODUCT (GDP)

Productivity is the amount of output per hour of labour, and productivity is low when the amount of quantity of output is not adequate compared to labour hour invested. GDP has positive relationship with productivity, however, the higher the productivity level, the high the per capita GDP, and vice versa. Low productivity is eminent where there is lack of infrastructure, tools, technology, inexperience and low level of education. As these in turn affect investment, there is fairly low standard of living. Diabetes mellitus due to its alarming increase in prevalence especially in developing countries can pose a huge threat in a nation's economy hence GDP, this is true because diabetes reduces life expectancy hence depleting both the quality and quantity of countries labour force which adversely affects national income (WHO, 2006).But

However, improving the nation's health and extending life expectancy by one year will rise GDP by as much as 4% (Blrom et al., 2004). The light behind this is because good health enables economically productive activities- work,

training, education and personal development. This in turn increase the availability of the labour force for work and their possible contribution to economic growth.

ANNUAC LOSS IN GDP(%) OF SOME COUNTRIES FROM 2005-2015 FROM DIABETES AND ITS COMPLICATIONS:

Diabetes Complications

Year	Brazil	China	India	Nigeria	Pakistan	Tanzania
2005	0.19	0.31	0.35	0.23	0.30	0.29
2015	0.48	1.18	1.27	0.65	1.02	0.86
2005	0.95	1.08	1.27	1.11	0.84	1.57
2015	3.21	3.94	5.04	3.07	3.08	4.19

(Adopted: WHO, 2006)

ANNUAL GAIN IN INCOME AS PERCENTAGE (%) OF GDP OF SOME COUNTRIES IN REDUCED MORTALITY FROM DIABETES AND ITS COMPLICATIONS

	BRAZIL	CHINA	INDIA	NIGERIA	PAKISTAN	TANZANIA
% GDP	0.03	0.04	0.05	0.03	0.03	0.01

Conclusion

Access to optimal treatment for diabetes positively impact the patients quality of life and their financial situation through improved production, their intellectual and emotional capacity and that of their families. People with diabetes can have an almost normal life with drastic reduction in their otherwise high risk disability and premature death.

Studies have shown that for any 2% reduction in the prevalence of death from diabetes and its associated complication between 2005-2015, 36 million people will be prevented from premature death, of which 17 million of them will be people below the age of 70{WHO, 2006}.

Since the ever increasing prevalence of diabetes is a threat to socio economic existence in the developing countries, it calls for national planning and allocation of resources as the prevalence Varies from country to country, state to state, races and ethnic group (Ekpenyoung et al.,2012) and an unflinching selfless services and cooperation by both the health professionals policy makers and government towards managing diabetes to minimize a long term effects and maximize current good health and vitality.

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