APPLICATION OF EPIDEMIOLOGY IN DIABETES MELLITUS IN SUB SAHARAN AFRICA: SCREENING OF DIABETES MELLITUS

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ABSTRACT

Sub Saharan African is being faced with an increased burden of diabetes mellitus. High levels of undiagnosed diabetes mellitus have been reported which is a cause of concern since diabetes mellitus causes complications which are expensive to manage. However screening for diabetes mellitus has not received much attention due to overwhelming of healthcare facilities with multiple disease burdens. The review sought to address screening of diabetes in Sub Saharan Africa.

Published journal articles and grey literature on screening of diabetes mellitus in Sub Saharan Africa were sought from pubmed, google scholar and google.

Reports of screening of diabetes mellitus in a general practice setting were found. In a rural setting community based and home based strategies of screening of diabetes mellitus were reported to be feasible. Diabetes mellitus screening was also reported be possible to integrate it with communicable disease screening.

Diabetes mellitus screening in Sub Sahara Africa is feasible. The integration of diabetes mellitus screening with communicable diseases is a worthwhile consideration in sub Saharan Africa taking into consideration the communicable disease burden.

STATEMENT OF PURPOSE

The review sought to address screening of diabetes mellitus in Sub Saharan Africa.

LITERATURE REVIEW

INTRODUCTION

Type 2 diabetes mellitus constitute approximately 90% of diabetes mellitus in Sub Saharan Africa where as type 1 diabetes mellitus, gestational diabetes and other variant forms make up the remainder (Hall, Thomsen, Henriksen, & Lohse, 2011). In Africa type 2 diabetes mellitus is becoming a major chronic disease health burden. 14 million people were estimated to have diabetes mellitus in Africa in 2011 and in 2030 the increase is expected to reach 28 million. In urban areas that's where the highest increase in prevalence is noted. The changing patterns of diet, physical activity and the ageing population are the major causes associated with increase prevalence of diabetes mellitus in Africa. High fat and high energy food together with less physical activity causes increase prevalence of obesity which leads to impaired glucose tolerance leading to increased susceptibility to diabetes mellitus (Bos & Agyemang, 2013).

The prevalence of type 2 diabetes mellitus in SubSaharan Africa reported in prevalence surveys ranges from 0.6 % observe in a rural area in Uganda to 12% observed in an urban area in Kenya. The prevalence of type 2 diabetes mellitus is showing an increasing prevalence from the studies carried out before 1985 in (Hall et al, 2011). In a recent study in Cape Town they have also demonstrated this increase in diabetes mellitus prevalence (Peer et al, 2012). In Zimbabwe the last survey carried out between May to June 2005, the prevalence of diabetes mellitus was found to be 10.2% whilst participants with a known history of diabetes mellitus were found to be 2.4% of the study participants (Ministry of Health and Child Welfare Government of Zimbabwe, University of Zimbabwe, World Health Organisation & United Nations Children's Fund, 2005).Incidence of type 2 diabetes mellitus has been reported in one study in Sub Saharan Africa carried out in Kinshasa between 2004 and 2008 in which an incidence rate of 29 per 1000 person years with 95% confidence interval of 15-43 (Hall et al, 2011).

Type 1 diabetes mellitus has been reported in four studies carried out in Sub Saharan Africa since 1990. The studies reported a prevalence of type 1 diabetes mellitus of 3.5 per 100 000 persons in Mozambique and 12 per 100 000 persons in Zambia. Incidence of type 1 diabetes mellitus range from 1.5 per 100 000 persons per year in Tanzania and 2.1 per 100 000 persons per year in Ethopia. The prevalence rate of gestational diabetes, mellitus recorded in Sub Saharan Africa range from 0% observed in Tanzania to 9% observe in Ethiopia. The population prevalence of other types of diabetes mellitus has not been reported in Sub Saharan Africa (Hall et al, 2011).

High rates of undiagnosed an uncontrolled diabetes mellitus reported in Sub Saharan Africa indicates the presence of barriers to accessing diagnosis and treatment. These high rates of patients with undiagnosed diabetes mellitus suggest that the screening practices in the region are not effective. There several barriers to accessing diagnosis and treatment which have been documented these include high cost of diabetes mellitus treatment, the limited availability of

tools for diagnosis, treatment and management of glucose. Low level of diabetes mellitus knowledge among health care workers has also been reported. Implementation of effective interventions will reduce the diseases burden of diabetes mellitus, as primary prevention and the treatment of diabetes mellitus can reduce the incidence of diabetes mellitus and its complications (Hall et al, 2011) and premature mortality (Peer et al, 2012).

It is important to note that screening for diabetes mellitus and other non communicable diseases has received little attention this has been attribute to overwhelming of health care facilities with multiple diseases burdens especially Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome(HIV/AIDS) (Peer et al, 2012). Considering that the budget allocation for diabetes mellitus has to compete with other pressing health issues in Sub Saharan Africa such as antiretroviral treatment, tuberculosis treatment and malaria control programs (Gill, Mbanya, Ramaiya & Tesfaye, 2009). Thus the review sought to highlight the need and feasibility of screening of diabetes mellitus in sub Saharan Africa.

METHODOLOGY

A desk review of published articles and grey literature sought from pubmed, google scholar and google was carried out. The search terms used on pubmed were diabetes mellitus AND screening AND sub Saharan Africa, diabetes metllitus AND screening programs AND sub Saharan Africa. These pubmed searches were limited to the last ten years. On google and google scholar to encompass grey literature the search terms used were diabetes mellitus screening subsahara African and diabetes mellitus screening programs sub Saharan Africa. This was a desk review thus no ethical approval was sought.

RESULTS

On pubmed the diabetes mellitus AND screening AND sub Saharan Africa gave 350 articles of these 122 were full text articles. The search diabetes mellitus AND screening programs AND sub Saharan Africa gave nine articles.

In a study in Nigeria at a general practice ten subject 2.4% who had previously undetected diabetes mellitus and nine (2.1%) had unrecognized impaired glycaemia were identified (Oyegbade, Abioye-Kuteyi , Kolawole, Ezeoma, Bello, 2007). In Kenya in a study to determine the feasibility of community based versus home based strategy for screening of diabetes mellitus and hypertension it was found that both were feasible but in a rural setting there is need to link screening, care and follow up to reduce preventable complications of diabetes mellitus (Pastakia et al, 2013).

In rural Uganda in 2011 it was demonstrated that it is feasible to integrate communicable and non communicable disease (which include diabetes mellitus) screening in a community wide testing for Human Immunodeficiency virus testing initiative. In the initiative they reached 74% of adults in a community of 6300 people spending 95 minutes per person using point of care

diagnostics. The cost of the program in this research program was $37.82/ participants which was projected to decrease with widespread implementation, increase in number of tested people and streamlining. This cost of adding non communicable diseases which include diabetes mellitus to community based Human Immunodeficiency Virus screening programs was reported to be $2.41 per person (Chamie et al, 2012). In a study in Lagos Nigeria they reported that the combination of diabetes mellitus and tuberculosis is comparable to Human immunodeficiency virus and diabetes mellitus but diabetes mellitus is underdiagnosed in people with tuberculosis (Ogbera et al, 2014).

DISCUSSION

The identification of people who are in the preclinical stages of diabetes mellitus using screening have an advantage of availing an opportunity to modify long term risk before occurrence of serious complications (Pastakia et al, 2013). There is evidence to justify opportunistic screening of diabetes mellitus of individuals at high risk in a clinical setting. Clinicians need to be vigilant when evaluating clinical presentations which suggest diabetes mellitus (American Diabetes Association, 2002).

General practice also provides an opportunity for diabetes mellitus screening since most people consult their general practitioner at least once a year (Oyegbadeea al, 2007). Adding the screening of non-communicable disease which include diabetes mellitus to community based testing offers a platform for the multi disease delivery and the cost of $2.41 per person is cost effective. Thus the investment made in Human Immunodeficiency Virus infrastructure is an opportunity and a way to deliver non communicable disease care which include diabetes mellitus in this resource constrained setting (Chamie et al, 2012).The lessons learnt from treatment and management of tuberculosis and Acquired immunodeficiency syndrome are likely to be useful in diabetes mellitus prevention, treatment and management plans (Renzaho, 2015).

In resource limited setting with high tuberculosis burden the opportunistic screening for diabetes mellitus is essential due to the fact that diabetes mellitus often is undiagnosed in tuberculosis patients (Ogbera et al, 2014). To improve success of the screening programs there is need to improve training, continuing health education and the support offered to health professionals (Chinenye & Young, 2011).

The limitation of the review is that studies and grey literature in English only were considered thus those in other languages could have been missed**.**

CONCLUSION

Diabetes mellitus screening in Sub Sahara Africa is feasible. The integration of diabetes mellitus screening with communicable diseases is a worthwhile consideration in sub Saharan Africa taking into consideration the communicable disease burden.

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