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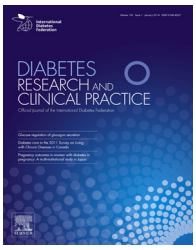

Invited review

Improving diabetes care in developing countries: The example of Pakistan

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ABSTRACT

Pakistan is a developing country with limited recourses and diverse economic social patterns. Pakistan has high prevalence of diabetes and its complication, which is a huge challenge to the existing health care system. The major contributing risk factors are urbanization and change in lifestyle, maternal and fetal malnutrition and genetic factors.

National action plans for control of diabetes have been made since 1995 but actions in this regard were not perfect. Training of primary care physicians and development of multidisciplinary diabetes care teams was initiated. Prioritization strategies were defined according to the International Diabetes Federation (IDF) guidance, mainly focusing on diabetic foot, diabetes education and children with diabetes. Researches for better understanding and management of diabetes in Pakistan were undertaken. Collaboration between various stakeholders was promoted at national and international level. In summary, public private relationships and development of multifaceted approaches is expected to improve the lives of millions of diabetics of Pakistan.

Contents

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1. Introduction

Pakistan is a developing country with limited resources and diverse economic and social patterns. It has a population of 161.66 million [1], of whom 68% live in rural areas, 33% of the population lives below the poverty line and 40% have no access to even basic health services [2]. Public expenditure on health and health infrastructure represents 0.7–0.8% of GDP and 3.5% of total government expenditure. Pakistan spends less than 30% of health budget on the development of health infra-structure [2]. The Government provides funding for diabetes as part of the general health system budget but diabetes itself receives an insignificant share. Specific funding through private and international collaborators is also very limited. There is no framework for diabetes monitoring and surveillance. Private partners and associations are carrying out some monitoring efforts but these are not sufficient.

A mixed public private health care system which exists in Pakistan is not equipped to cope with the rising prevalence of non-communicable diseases. Government has employed around 100,000 lady health workers for basic maternal and preventive child care services in rural areas [3], but these are only maximally matriculate in education. Also they are not trained to provide care for non-communicable diseases. Similarly there is shortage of qualified health care professionals in urban areas and private family physicians with no formal training of diabetes management provide the primary care services to the majority of diabetic patients.

Pakistan has an estimated 6.7 million people affected with diabetes, according to the International Diabetes Federation (IDF) and this number is predicted to increase to 12.8 million by the year 2035 [4]. Diabetic Association of Pakistan (DAP) has contributed significantly by serving as WHO collaborating center for diabetes and was involved in conducting national diabetes surveys [5–9].

There is also an enormously high rate of chronic complications of diabetes. The reported frequency of coronary artery disease (CAD) is 15.1% and the projected increase in mortality per 100,000 population is from 125.5 to 144.4 [10]. Similarly, peripheral vascular disease (PVD), and cerebrovascular disease is 5.5% and 4.5%, respectively [11,12]. As regards the micro vascular complications, 15.9% patients had retinopathy, 8.4% had nephropathy and 4% were affected by diabetic foot ulcer [11,12]. The situation is further aggravated by the rising prevalence of metabolic syndrome (MS), childhood obesity and younger ages of onset of type 2 diabetes like in many other developing countries worldwide specially South Asian countries [13].

The rapid increased prevalence of diabetes can partly be attributed to environmental and behavioral changes resulting from lifestyle changes. The highest rates of urbanization are seen in Korea, Malaysia, Singapore, Philippines and Indonesia while India, Pakistan, China and Thailand have intermediate rates followed by Sri Lanka and Bangladesh having slow rates of urbanization [14]. These changes result in various adverse outcomes mainly physical inactivity, increase usage of electronic media like internet and television, unhealthier foods rich in calories and increase in obesity. As an example, in the World Health Survey 2002, inadequate consumption of fruits and vegetables was identified among masses in Pakistan compared with other countries [15].

High rates of obesity among children and women and association of obesity with metabolic risk including diabetes have been observed. The South Asian population specifically has shown to have one of the highest risks [16]. Approximately one in every four subjects aged 15 years or above is already overweight or obese in Pakistan. These changes in lifestyle are not limited to urban areas but rural population is also showing a similar trend worldwide, Pakistan being no exception. A recent study was carried out in the rural area of Hub, Baluchistan, to observe the temporal charges in the prevalence of diabetes, and its associated risk factors. In this community based survey of 1264 subjects aged 25 years and above, a two fold increase in the prevalence of diabetes (from 7.2% in 2002 to 14.2 in 2010) and impaired fasting glucose (from 6.5% to 11%) was observed over a period of 5 years with positive family history of diabetes showing significant increase from 7.6% to 16.52% [17]. Obesity increased from 10.15% to 27.82%, and smoking was seen in 21.3% compared to 4.06% in 2002. Similar pattern of metabolic derangements leading to T2DM were observed in young adults aged 15–25 years [18].

Malnourishment among pregnant mothers is another modifiable risk factor unfortunately still prevalent in Pakistan. Maternal mortality rate is 27.6%, while low birth weight (LBW) is reported to be 26%, both of which are very high reflecting the state of maternal nutrition [19]. These factors predispose the offspring to Intrauterine Growth Retardation (IUGR) and expose the baby to higher risk of developing type 2 diabetes [20]. In fact, it is the extra rate of catch up growth that at times results in increase in body fat rather than muscle mass and bone length. The resultant stunting is an indicator of early malnutrition. The reported frequency of stunting in Pakistani children is around 61.9% and nutrition indicators demonstrate that around 20% of children would be stunted and overweight predisposing them to central obesity and type 2 diabetes [21].

Contribution of genetic factors in predisposition of South Asians to diabetes has been specified [22–24] and data on immigrant Pakistani population confirmed the association of certain genetic variants with type 2 diabetes [25]. In Pakistan, ethnic differences have been noted but the studies were neither controlled nor accounting for all the risk factors. Genetic component in the occurrence of diabetes could not be verified.

2. National action plans

Pakistan was one of the first developing countries to have formulated an integrated national action plan (NAP) for non-communicable diseases, main contributors being Ministry of Health (MOH), WHO and Heart File an NGO (non-governmental organization) [26]. The NAP was a comprehensive strategy involving all the stakeholders for the prevention of non-communicable diseases [27]. The government could not maintain enough high level thrust to the NAP mainly because of lack of political will, conflict of interest with tobacco and food industries and inability to prioritize NCDs in health