Assessment of Diabetes Mellitus in India and Nepal

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Assessment of Diabetes Mellitus in India and Nepal

Author(s): Yadav NK, Sathian B, Kalai RS

Abstract

Background: Diabetes mellitus is a metabolic disorder and major health problem of all the countries. Low and middle income countries face the greatest burden of diabetes mellitus. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. Objectives: The main objective of this was to find out the prevalence of diabetes mellitus in urban and rural area of India and Nepal. Methods: Published research articles, books, bulletins, and online materials regarding to diabetes mellitus were studied both in national and international scenarios. Results: Diabetes in urban Indians is reaching an epidemic and the prevalence of type 2 diabetes mellitus in Asian Indians ranges from 2.7% in rural India to 14% in urban India. The latest report the total percentage of new and old cases of diabetes mellitus was 19.78%, 16.06% in males and 22.04% in females of Karnataka, India. Diabetes prevalence was 25.9% and higher proportion of diabetes was demonstrated in male (27.1%) than the females (24.8%) in Kathmandu valley of Nepal. All studies showed the higher prevalence of diabetes in India and Nepal. Conclusion: Nationwide prevalence surveys of diabetes have never been undertaken in India and Nepal. Thus, the true magnitude of diabetes has remained unknown in both the country.

Background

Diabetes mellitus is one of the most common chronic diseases in nearly all countries, and continues to increase in numbers and significance, as changing lifestyles lead to reduced physical activity, and increased obesity. It is resulting from a defect in insulin secretion, insulin action, or both. Insulin deficiency in turn leads to chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism [1-3]. Diabetes mellitus may be categorized into several types but the two major types are type 1 (Insulin Dependent Diabetes Mellitus) and type 2 (Non Insulin Dependent Diabetes Mellitus) [4, 5]. Type 1 diabetes mellitus is present in patients who have little or no endogenous insulin secretory capacity and who therefore require insulin therapy for survival [5, 6]. Type 2 diabetes is the commonest form of diabetes and is characterized by disorders of insulin secretion and insulin resistance [7] and about 90% of people with diabetes around the world have type 2. It is largely the result of excess body weight and physical inactivity [8] and common in individuals over the age of 40. There is a higher incidence of type 2 diabetes in urban than in rural areas [9] as well as incidence is associated with population whose lifestyle has changed from traditional patterns to a modern “Westernized” model [10]. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of diabetes is higher in men than women, but there are more women with diabetes than men. The diabetes mellitus in urban population in developing countries is projected to double between 2000 and 2030 [11]. About 1.1 million people were estimated to have died due to diabetes in 2005 and almost 80% of diabetes deaths occur in low- and middle-income countries and mostly people under the age of 70 years; 55% of diabetes deaths are in women [12]. The current study was designed with an objective to assess the prevalence of diabetes mellitus on population of India and Nepal.

Methods

This review paper was prepared with extensive study of published articles that were available in web of science database, open access materials in the Google, books, institutional bulletins, and online material from the reliable sources. It coverage of more than 20 materials published from 1987 to 2011 both nationally and internationally. This review paper explores the magnitude of the constraints and factors that may contribute to the prevalence of diabetes mellitus in Nepal and India in relation to the global and regional scenario.

Data abstraction and analysis:

Before preparing this review, it was attempted to collect as many published materials as possible regarding diabetes mellitus in India and Nepal. The prevalence of diabetes mellitus, types, etiology, epidemiology in India, Nepal and world etc. were the key words used for searching related materials in the web, library, and in institutions. The major findings in each research have been highlighted and the
prevalence of diabetes mellitus has been discussed throughout this review paper.

Result

Diabetes mellitus in India:

India is often referred as the diabetes capital of the world. It is currently experiencing an epidemic of type 2 diabetes mellitus and has the largest number of diabetic patients [13]. The International Diabetes Federation 2009 report reveals that the total number of diabetic subjects in India is 50.8 million [14]. The Prevalence of diabetes in India study reported an age-standardized prevalence of 4.3%, 4.4% and 4.5% for all adults, and males and females, respectively [15]. However, more recent studies based on urban populations or rapidly developing regions have reported a higher prevalence of diabetes i.e.10.1% [16, 17] while other studies from rural Indian populations have demonstrated an even higher prevalence i.e.12.5%–13.2% [18, 19]. Diabetes in urban Indians is reaching an epidemic and the prevalence of type 2 diabetes mellitus in Asian Indians ranges from 2.7% in rural India to 14% in urban India [20, 21]. A study conducted by Ramachandran et al. showed the prevalence of diabetes in an urban Indian population has significantly increased from 8.3% in 1989 to 18.6% in 2005, and during the same period a similar increase from 2.2% to 9.2% was observed in a rural Indian population [22].

According to the Zaman et al. latest report the total percentage of new and old cases of diabetes mellitus was 19.78%, 16.06% in males and 22.04% in females (Table 1). They also observed the frequency of diabetic cases was highest in the 50-59 years age group (32.10%) [23]. Ravikumar et al. reported the age-standardized prevalence of diabetes (11.1%) and pre-diabetes (13.2%) study were conducted at Chandigarh, India [24].

Table 1: Prevalence of diabetes mellitus in rural India

<table>
<thead>
<tr>
<th>Author (first name)</th>
<th>Location</th>
<th>Rural area (%)</th>
<th>Urban area (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arora (21)</td>
<td>Telangana</td>
<td>10.0</td>
<td>10.2</td>
<td>10.1</td>
</tr>
<tr>
<td>Majumdar (19)</td>
<td>Karnataka</td>
<td>16.0</td>
<td>13.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Balagopal (25)</td>
<td>Tamilnadu</td>
<td>14.1</td>
<td>11.2</td>
<td>12.5</td>
</tr>
<tr>
<td>Ramachandran (22)</td>
<td>Karnataka</td>
<td>13.4</td>
<td>9.3</td>
<td>11.1</td>
</tr>
<tr>
<td>Chow (28)</td>
<td>Madras</td>
<td>13.2</td>
<td>9.9</td>
<td>11.1</td>
</tr>
<tr>
<td>Mehta (36)</td>
<td>Maharashtra</td>
<td>14.8</td>
<td>12.0</td>
<td>13.2</td>
</tr>
<tr>
<td>Shrestha (31)</td>
<td>Nepal</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Mehta (36)</td>
<td>Nepal</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Singh (37)</td>
<td>Nepal</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
</tbody>
</table>

The data published in April 2011 by WHO showed deaths due to diabetes mellitus reached 3,224 (2.17%) of the total deaths in Nepal [38]. This may be due to changes in life style, urbanization and physical inactivity. A strong association is well recognized between the presence of diabetes, hypertension, chronic kidney disease and cardiovascular diseases [39]. A study conducted by Mittal et al. in Phokhara valley showed diabetic patients in between 41-100 years were 2.8 times more at risk of developing kidney disease as compared to age group (0-40 years) (Odds Ratio=2.8, p=0.0001). Diabetic patients were twice at risk of developing kidney disease than non diabetics (Odds Ratio=1.97, p=0.001) [40].

Diabetes mellitus in Nepal:

Diabetes is an endemic disease in Nepal, and is bringing new challenges in connection with rapid urbanization and modernization [30]. A survey conducted in Urban Nepal between 2001 and 2002 showed that 10.8% and 13.2% of males suffered from diabetes and pre-diabetes respectively, with the values for females being 6.9% and 10.2%, respectively [31]. The Nepal Diabetes Association reported that diabetes affects approximately 15% of people ≥ 20 years and 19% of people ≥ 40 years of age in urban areas [32]. According to WHO, diabetes affects more than 436,000 people in Nepal, and this number will rise to 1,328,000 by 2030 [33]. The percentage of diabetic patients has increased from 19.04% in 2002 to 25.9% in 2009 in Nepal [34].

The study conducted by Chhetri et al. showed diabetes prevalence was 25.9% and higher proportion of diabetes was demonstrated in male (27.1%) than the females (24.8%) in Kathmandu valley of Nepal [35]. Mehta et al. reported the prevalence of diabetes mellitus in people of urban and rural area were 22.8% and 20.0% respectively (Table 2) [36].

Table 2: Prevalence of diabetes mellitus according area of residence in Nepal

<table>
<thead>
<tr>
<th>Author (first name)</th>
<th>Male (%)</th>
<th>Females (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mehta (36)</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
<tr>
<td>Shrestha (31)</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
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<td>Singh (37)</td>
<td>13.4</td>
<td>11.2</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Discussion

This is an updated review of the diabetes mellitus in India and Nepal focused in prevalence status in males and females as well as in rural and urban area. Diabetic mellitus is a metabolic disorder, characterized by hyperglycemia may be due to insulin deficiency or insulin resistance [41]. The global diabetes prevalence in the age group 20-79 years were estimated to be 6.6% for the year 2010 which translates into 285
million people suffering from diabetes, according to international diabetes federation diabetes atlas [42]. The reasons for increasing prevalence are not clearly evident but changes in lifestyle and physical inactivity can be an important contributor. Low and middle income countries face the greatest burden of diabetes. A study conducted by Zaman et al showed higher prevalence of diabetes (19.78%) in Karnataka [23] as well as Vijaykumar et al also showed higher prevalence of diabetes (12.5%) in Kerala, south India. Many villages in south India especially Kerala and Karnataka have undergone a marked change in living standards and lifestyles on account of the influx of money in recent years from people working abroad in the Gulf States and other affluent countries higher prevalence of diabetes could be expected in south India especially Kerala since it has the highest proportion of elderly in India [19]. The prevalence of diabetes was more in women (22.04%) compare to men (16.06%) in Karnataka people [23]. Mehta et al showed higher prevalence of diabetes in people staying in Sunsari district, eastern Nepal [36]. Nepal is a developing country and people are changing their lifestyle like anything, they like to work by not doing hard work, this are making people physically inactive which is risk factor for development of obesity as well as diabetes. The prevalence of diabetes is increasing day by day in Nepal may be due to urbanization. Mehta et al and Singh et al showed the prevalence of diabetes in urban area were higher in compare to the rural area [36, 37].

Prevention:
There is an urgent need of educating the public about diabetes risk factors, prevention, and complications, using clear and simple messages. Global evidence shows that awareness strengthens national policy efforts and improves health outcomes.

Conclusion

Nationwide prevalence surveys of diabetes have never been undertaken in India and Nepal and there are few published reports of population prevalence of diabetes. Thus, the true magnitude of diabetes has remained unknown. To get actual data for the prevalence of diabetes mellitus in India and Nepal requires the nationwide study in the future.

References

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