Chapter 1

Introduction

1.1. Introduction

Diabetes mellitus leads to illness, disability, poor quality of life, and premature death. It is a contributing factor to several other causes of morbidity and mortality. It also increases the risk of a variety of complications including end-stage kidney disease, coronary heart disease, stroke and other vascular diseases. It is one of the leading causes of death worldwide. In 2000 the global mortality attributable to diabetes was estimated to be 7.5 million deaths. Of these, 4.6 million died from other causes associated with diabetes and there were 2.9 million deaths from diabetes, with 1 million deaths in developed countries and 1.9 million deaths in developing countries. Rates were higher in females than in males. Deaths from diabetes contributes to 5.2% of world all causes mortality (Roglic et al, 2005). In 2007 diabetes was expected to cause 3.8 million deaths among adults 20 years of age and older, with 2.0 million deaths in females and 1.8 million in males, approximately 6.0% of total world mortality. Over two thirds of these deaths are expected to occur in developing countries. The proportion of worldwide deaths attributable to diabetes is estimated to be higher in females than in males (IDF, 2006).

This study aims to investigate incidence of mortality rates from diabetes for each age group by year, gender and province and to construct statistical model to estimate mortality rate, based on diabetes mortality data from 1996 to 2006 in Southern Thailand.

1.2 Disease definition

Diabetes mellitus (DM) is a chronic disease that occurs when the pancreas does not produce enough insulin or alternatively when the body cannot effectively use the insulin. Insulin is a hormone that regulates blood sugar. Raised blood glucose level is a common effect of uncontrolled diabetes, and in the long term leads to serious damage to many organs of the body, especially the nerves, eyes, kidneys and blood vessels. The major two classes of diabetes mellitus are insulin-dependent diabetes mellitus (type 1) and non insulin-dependent diabetes mellitus (type 2). Type 2 diabetes mellitus accounts for more than 90% of all diabetes cases. Type 1 diabetes mellitus is characterized by a lack of insulin production. Without daily administration of insulin, Type 1 diabetes is rapidly fatal and appears to be the increase in people aged 30 years or below. Type 2 diabetes mellitus results from ineffective use insulin in the body (World Health Organization, 2005).

1.3 Situation in Thailand

Diabetes Mellitus is one of the major causes of morbidity and mortality in Thailand. There is an increasing numbers of diabetes every year. Most of diabetes patients have Type 2 diabetes and they account for 95-96.3 percent of all diabetic patients. There were 1,125,800 patients in 2000 this is and expected to increase to 2,095,000 patients by 2010. Females and urban dwellers demonstrated greater risks for diabetes than rural dwellers Cardiovascular diseases was the leading cause of death among diabetes in Thailand (Vichayanrat et al, 2001). It was the fourth most common cause of death in Thailand, (with 19,000) cases and accounted for 5% of all deaths in 2002 (World Health Organization, 2006). In 2006, diabetes mortality rates were high in upper

Northeast with 19.1 per 100,000 population, with especially high incidence in Roi Et, Khon Kaen, and Kalasin provinces.

1.4 Literature review

In 2000 it is estimated that171 million (2.8%) people will live with diabetes in the world. In 2030 it is expected to be 366 million (4.4%). There are more women than men (Wild et al, 2004).

Diabetes in developing countries

A study of trends in mortality from diabetes mellitus in Taiwan between 1960-1988 found that the death rate was 3.7 per 100,000 population in 1960 and increased to 23.2 per 100,000 in 1988. It was a 6.3 fold increased over the past 30 years with females mortality rates higher than males. The metropolitan resident diabetes mortality rates are as high as rural. The oldest age group of 70 and over have mortality rates higher than other age categories (Lin & Lee, 1992).

A study on associations of diabetes mellitus and ethnicity in Singapore followed 3,492 diabetes patients from 1992 to 2001 and 108 died during the study period. In this study Indians had the highest prevalence of diabetes, followed by Malays and Chinese. Malays and Indians with diabetes have mortality rates that are almost double those of Chinese (Ma et al, 2003).

There was a study on mortality rate in diabetic and non-diabetic subjects in urban south India which has the largest numbers of people with diabetes in the world during the period of 1997 and 2004. The trend showed that age of onset diabetes shifted to a younger age (Mohan and Pradeepa, 2009). The other study in India investigated all individuals ≥ 20 years of age in urban India, mortality rates are two fold higher in

people with diabetes compared to non-diabetic subjects. Cardiovascular diseases and renal were the leading causes of death among diabetes which people aged more than 60 year had high mortality rate (Mohan et al, 2006).

A follow-up study on mortality and risk factors of cardiovascular disease in 229 Thai type 2 diabetic patients aged 20 or more from 1997 to 2001 at Price of Songkla University hospital. There were 29 deaths during the study period. Sepsis and cardiovascular disease were the major causes of death in Thai type 2 diabetes patients (Leelawattana et al, 2003).

Diabetes in developed country

A follow-up study on mortality from diabetes in 1,221 Japanese during 1962-1979 found 201 deaths. There were 2.55% for males and 1.64% for females. The excess mortality contributing to diabetes was also higher in males than in females (Sasaki et al, 1983).

A population-based study on mortality from diabetes in a national sample of the US elder aged 65 or more from 1994 to 1996. There were 14.8% (22,044) deaths with diabetes during the study period. The elders with diabetes have higher mortality rates than the general population in every age group (Bentoni et al, 2002).

Deaths associated diabetes

A study on the mortality in a cohort of Scottish diabetes patients during 1984-1986 found that 51 percent of all diabetes death was from ischaemic heart disease, with the highest diabetes relative risk of death for age groups 45-64 years (Waugh et al, 1989).

The other study on mortality from type 2 diabetes follow-up for 5 year in a prospective cohort study of 736 individuals diagnosed with type 2 diabetes in UK

found that type 2 diabetes was associated with a 2.5-fold increase in the odds of mortality. Cardiovascular disease and cancer were the leading cause of death among diabetes (Guzder et al, 2007).