

Surgical Treatment Of Type II Diabetes Mellitus

Essay

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General Surgery

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INTRODUCTION

Diabetes mellitus is a chronic debilitating disease which account for more than 171 million people in 2000 & suspected to be 366 million people in 2030 (World Health Organization “WHO”, 2005). Data on diabetes prevalence by age and sex from a limited number of countries were extrapolated to all 191 World Health Organization member states and applied to United Nations’ population estimates for 2000 and 2030.

The prevalence of diabetes for all age-groups worldwide (WHO) was estimated to be 2.8% in 2000 and 4.4% in 2030. The urban population in developing countries is projected to double between 2000 and 2030.

The most important demographic change to diabetes prevalence across the world appears to be the increase in the proportion of people more than 65 years of age . These findings indicate that the “diabetes epidemic” will continue even if levels of obesity remain constant. Given the increasing prevalence of obesity, it is likely that these figures provide an underestimate of future diabetes prevalence.

(Sarah et al., 2004).

Statistics from United States according to National Health Interview survey (NHIS) indicated that the total prevalence of diabetes for all ages was 20.8 million people in 2005 (about 7% of population) from these 14.6 million people was diagnosed & 6.2 million people was undiagnosed.

The overall global prevalence of type 2 diabetes is rising steadily. Previously, type 2 diabetes was predominantly a disease of middle-aged and older people. In recent decades, the age of onset has decreased and type 2 diabetes has been reported in adolescents and children worldwide, particularly in high prevalence populations. Japan has seen an approximate fourfold rise in the incidence of type 2 diabetes in 6- to 15-year-olds, and between 8 and 45% of newly presenting children and adolescents in the U.S. have type 2 diabetes.

(Alberti et al., 2004).

Diabetes prevalence, costs, and complications are growing at alarming rates in the United States & worldwide. The prevalence of diabetes is increasing at similar rates for men and women. Some complications, such as lower-extremity amputation and end-stage renal disease, are more prevalent among men, particularly among ethnic minority groups. Diabetes is also a significant contributor to erectile dysfunction (*Lynda et al., 2004*).

Type II diabetes which is adult onset diabetes mellitus account for 90% -95% from all cases of diabetes. Factors shown to increase the risk of type 2 diabetes are ethnicity (African Americans, Hispanics, and American Indians), physical. Inactivity, age, obesity, and family history (*Mokdad et al., 2001*).

In the past decade, we have witnessed an epidemic of both type 2 diabetes and obesity. The prevalence of type 2 diabetes has increased by 33% in the United States, and 62% of Americans are classified as obese (BMI more than 30kg/m²) or overweight (BMI 25–29.9kg/m²). The recent increase in the prevalence of obesity is closely paralleled by the increase in the prevalence of diabetes. Indeed, this new unprecedented

phenomenon has been referred to as “diabesity.” There is a clear strong relationship between obesity and the risk for diabetes (*Sonia , 2006*).

Diabetes has a major impact on both affected individuals and society in general, with a total cost in excess of \$132 billion annually not to mention its associated increased morbidity and lost quality-of-life years (*Steven and Sally, 2006*).

Complications of diabetes including various types of diabetic comas which necessitate urgent hospital admission & long term morbidities. In one study, people with diabetes were reported to be 3.3 times more likely to be diagnosed with ischemic heart disease, 3.1 times more likely with peripheral vascular disease, 2.8 times more likely with hypertension, and 2.3 times more likely with cerebrovascular disease (*Macleod and Tooke, 2001*).

Diabetic glomerulopathy accounts for 25–35% of people entering end-stage renal disease (ESRD) programs, at a cost of > \$1 billion annually (*Steven and Sally, 2006*). Diabetic retinopathy & Diabetes is the leading cause of adult blindness in the United States. Visual impairments affect ~ 25% of all adults with diabetes, or nearly 1.6 million Americans. Diabetic retinopathy affects nearly 70% of people with type 1 diabetes and > 60 % of those with type 2 diabetes (*American Diabetes Association, 2004*).

Diabetes is the sixth leading cause of death in the United States, accounting for 3.0% of deaths each year. An estimated 400,000 adults with diabetes die each year (*Steven and Sally, 2006*).

Other complications include erectile dysfunction, peripheral neuropathy, urinary tract infections, respiratory infections & pneumonia,

skin infections & impaired wound healing & psychological problems. In a study by Eppens and associates indicates that youth with type 2 diabetes have significantly higher rates of microalbuminuria and hypertension than their peers with type 1 diabetes, despite shorter diabetes duration and lower HBA1C. The results of this study support recommendations for early complications screening and aggressive targeting of glycemic control in patients with type 2 diabetes (*Eppens et al., 2006*).

Several randomized, controlled clinical trials (RCTs), completed during the past several years or currently underway, are defining the scientific basis of contemporary diabetes care. In terms of glycemic control landmark RCTs have demonstrated that meticulous glycemic control reduces risk of microvascular and neurological complications of diabetes (*Skylar et al., 2004*).

Treatment includes traditional daily physical activity, restriction of carbohydrate intake, weight loss & pharmacological agent including insulin and oral hypoglycemic drugs.

Recently, bariatric surgery was found to be the cause of significant weight loss (60% percent of excess body weight loss) and resolution (83%) of Type 2 DM. Patients with the shortest duration and mildest form of Type 2 DM had a higher rate of Type 2 DM resolution after surgery, suggesting that early surgical intervention is warranted to increase the likelihood of rendering patients euglycemic (*Schauer et al., 2003*).

Even in absence of obesity , bariatric surgery may be the potential cure of type 2 diabetes (*Francesco and Jacques, 2004*) .

Aim Of The Work:

To spot light on the potential surgical treatment of type II diabetes mellitus.

Contents:

- 1- Anatomy of stomach, small intestine and biliary tract.
- 2- Pathophysiology of diabetes.
- 3- Anatomy after surgery.
- 4- Mechanism of glycemic control after surgery.
- 5- Surgical operations:
 - a. Sleeve gastrectomy (SLG) with ileal transposition.
 - b. Biliopancreatic diversion (BPD) with /without duodenal switch.
 - c. Gastric bypass (RYGB).
- 6- Summary and Conclusion.
- 7- Recommendations.
- 8- References.
- 9- Arabic summary

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