An overview of the Epidemiology of Type 1 Diabetes Mellitus -

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INTRODUCTION

Type 1 Diabetes Mellitus (T1DM) is a chronic illness characterized by the insufficient production of insulin due to autoimmune destruction of beta cells in the pancreas. However, the disease can develop in adults, onset most often occurs in childhood [1]. T1DM can be considered as one of the most frequent endocrine and metabolic conditions in children. Information on frequency of childhood onset T1DM are very restricted. As indicated by the International Diabetes Federation (IDF), the number of youth (0-14 years) diagnosed and newly diagnosed cases per year was 497,100 and 78,900, respectively [2]. In children and teenager, T1D represents 80%-90% of diabetes [3]. It was declared that 3 million Americans had T1D in the US in 2010 [4]. In the US, the prevalence of T1D in youth more youthful than 20 years was 1.93/1000 in 2009 [5]. T1D is chiefly occur following an autoimmune demolition of the pancreatic beta cells through cell mediated immunity as well as a humoral immune response. Understanding these factors can play a significant role in the clinical care of patients, treatment and prevention of disease. Epidemiological studies around the world show that the incidence of T1D has been increasing. DIAMOND Project, EURODIAB and SEARCH are the most important projects for childhood diabetes. Epidemiological studies around the world demonstrated that the incidence of T1D has been increasing by 2-5%. Furthermore, in the "US" Sit has been indicated that the prevalence of T1D is approximately 1 in 300 by 18 years of age.

Conclusion: Considering the high prevalence of T1D and related risk factors, strategic planning for disease prevention and reduction is necessary.

Keyword: Type 1 Diabetes; Epidemiology; Childhood Diabetes
T1D in this period was 3.4% (95% CI 2.5-4.4%) (the rate of increase was noted to be higher)[25].

RISK FACTORS

Several risk factors such as age, sex, race, genotype, geographic location and season have been associated with TID.

Age

More than 85% of all diabetes cases have been reported in youth < 20 years of age worldwide. Incidence peak of T1D has increased at ages 10-14 years throughout the world. Registries in Europe suggest that recent incident rates of T1D were the highest in the youngest age-group (0-4 years). After puberty, incidence rates decline and appear to stabilize in ages 15-29 years [26].

Gender

Women was affected by most common autoimmune disorders, but in young population with T1D, girls and boys are equally affected [24].

Genotype and genetic risk factors

Among the most important genes can be introduced in susceptibility to T1D is the Human Leukocyte Antigen (HLA) complex on chromosome 6, especially noted for the HLA class II [27]. In fact, about 90% -95% of young people who are diagnosed with T1D have both haplotypes, but about 5 % of people carry this haplotype, will develop disease [28]. Detailed mapping indicates that the polymorphism and the number of Variable of Tandem Repeat (VNTR) is located in the insulin gene promoter, plays a role in T1D susceptibility. Homozygous individuals for shorter repeats as VNTR type I have a high risk for the disease while carriers for longer repeats as VNTR type III protects against T1D. As a result, following the lower induction of insulin and its precursors transcription in the thymus by VNTR type I, tolerance reduce and T1D develop. Conversely, in individuals with VNTR type III variant, insulin-reactive T cells are removed in the thymus by negative selection [1]. Among the other factors considered in T1D, allelic variation in the Interleukin (IL)-2 receptor gene (IL2RA) region[16,29], PTPN22 which encodes the Lymphoid Protein Tyrosine Phosphatase (LYP)[30,31], CTLA-4 which encodes cytotoxic T lymphocyte-associated protein 4 in the IDDM12 region [32] are remarkable.

Seasonality of onset and birth

Several studies evaluated the relationship of diabetes with seasons, although the results have been controversial [33]. In some studies, the prevalence of diabetes have been reported by month of birth and month of diagnosis. McKinney also reported the lowest and the highest rates of T1D in December and April, respectively, in Ukraine [34]. Similar reports have been published also showed that higher and lower rates of T1D among youth people from Europe, New Zealand and Israel born in Spring and autumn, respectively [24]. Such findings was not found in other studies on people from Europe, East Asia and Cuba [35].

TREATMENT & MANAGEMENT

Patients with type 1 diabetes mellitus require lifelong insulin therapy. Most require 2 or more injections of insulin daily, with doses adjusted on the basis of self-monitoring of blood glucose levels. Long-term management requires a multidisciplinary approach that includes physicians, nurses, dietitians, and selected specialists. The American Diabetes Association (ADA) recommends using patient age as one consideration in the establishment of glycemic goals, with targets for preprandial, bedtime/overnight, and hemoglobin A1c (HbA1c) levels.

In 2014, the ADA released a position statement on the diagnosis and management of type 1 diabetes in all age groups. The statement includes a new pediatric glycemic control target of HbA1c of less than 7.5% across all pediatric age groups, replacing earlier guidelines that specified different glycemic control targets by age. The adult HbA1c target of less than 7% did not change. Individualized lower or higher targets may be used based on patient need [36].

CONCLUSION

Epidemiological studies around the world show that the incidence of T1D has been increasing by 2-5%. Furthermore, in the US it has been indicated that the prevalence of T1D is approximately 1 in 300 by 18 years of age. One of the interesting topics for researchers is study of genetic and environmental risk factors involved in T1D. Understanding these factors can play a significant role in the clinical care of patients, treatment and prevention of disease. In recent years the idea that T1D is a disease of children and adolescents has changed, so that now the age of onset of symptoms is not considered as an important factor.

REFERENCES