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Letter to editor

Trend in the incidence of type 1 diabetes (T1DM) among Qatari and Arab gulf children and adolescents over the past 20 years

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To the Editor,

During the last decades, the world has seen a dramatic increase in the prevalence of diabetes mellitus, with special regard to the developed countries. More than 96,000 children and adolescents under 15 years are estimated to be diagnosed with T1DM annually and when the age range covers up to 20 years, the number is estimated to be more than 132,600 (1). The incidence of T1DM varies greatly between different countries, within countries, and between different ethnic populations, with the highest incidence rates observed in Finland, Northern Europe, and Canada (2).

We reviewed the literature to find out the trend in of T1DM incidence in children and adolescents (age 6 months -18 years) in the state of Qatar in the past 20 years and compared them with the data reported in other Arabic gulf countries.

The reported incidence rates of T1DM in the state of Qatar over the period between 2006-2011 was 23.15/100 000 (95% CI: 20.1 -26.4), whereas the reported incidence between 2012-2016 was 28.39/100 000 (95% CI:31.82-40.03). In 2020, the incidence of T1DM increased to 38.05 per 100 000 (95% CI: 32.5-44.28) (Figure 1).

The Arab region appears to have a higher prevalence of diabetes than the global average. Five of the top 10 countries with the highest prevalence of diabetes (in adults, aged 20 to 79 years) are in the Arab gulf region: Kuwait (21.1%), Qatar (20.2%), Saudi Arabia (20.0%), Bahrain (19.9%) and UAE (19.2%).

In Kuwait, the incidence of T1DM in children and adolescents doubled from 20.18/100 000 (in 1995-1999) to 40.9/100 000 (in 2011-2013). These data confirm significantly high incidence and markedly increasing trend of T1DM in children and youths in the Arab Gulf states (3). In the largest country in the Gulf area (KSA), the reported incidence of T1DM in children and adolescents changed from 18.05/100000 (1990-1998) to 33.5/100000 in 2017.

The incidence and trend of T1DM in Arab Gulf countries is extremely high compared to other Asian countries where the incidence of T1DM is very low. Different genetic/environmental interactions might operate in the etiology of T1DM between Caucasians. Arabs and Asians (4). Among different Arab countries, several non-HLA genes have been reported to be associated with susceptibility to T1DM, including CTLA4, CD28, PTPN22, TCRβ, CD3z, IL15, BANK1, and ZAP70 (5).

In 2015, the incidence of T1DM in Qatar (33.49/100000) was only lower than Finland (62.3/100 000), Sweden (43.2/100 000), and higher than Norway (32.5/100 000), the United Kingdom (28.2/100 000), Canada (25.1/100 000) and USA (23.7/100 000). The DRB1*0401-DQB1*0302 haplotype was the most prevalent disease susceptibility haplotype in the Finnish population followed by (DR3)-DQA1*05-DQB1*02

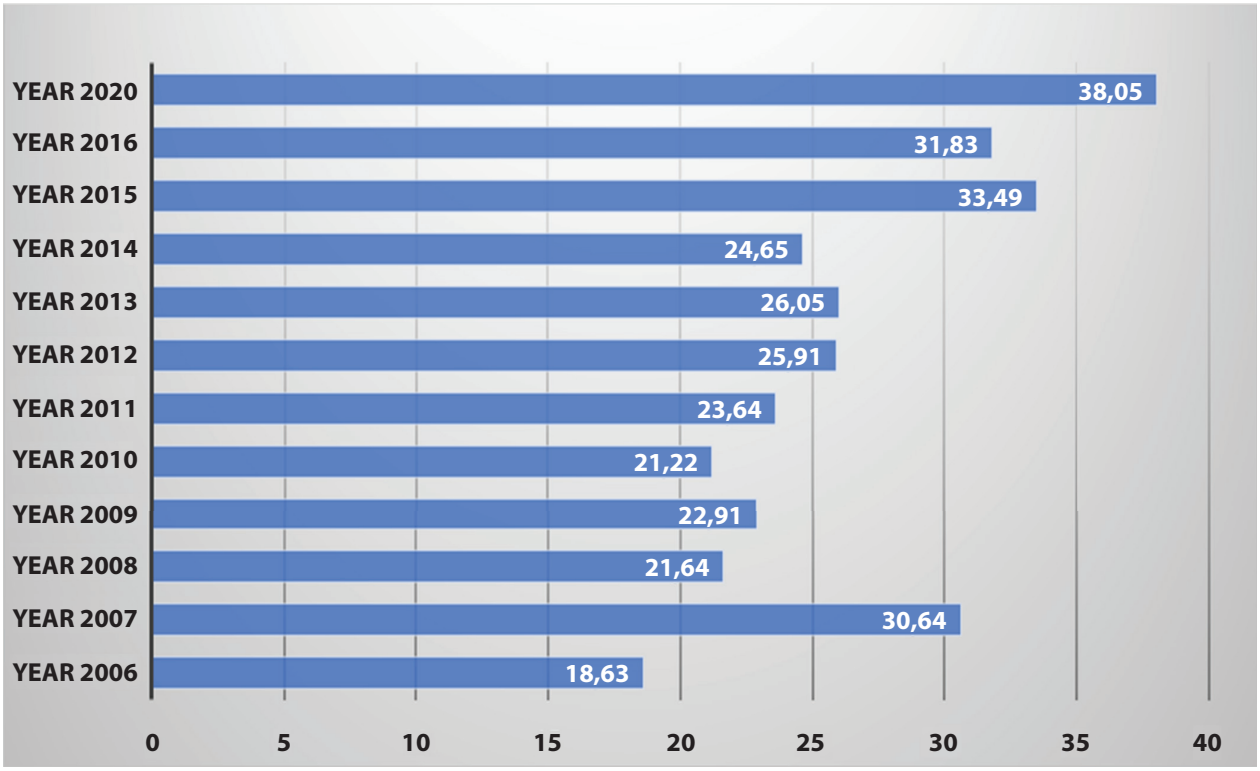

Figure 1. Trend of type 1 diabetes mellitus incidence, in Qatari children and adolescents, from 2006 to 2020.

and DRB1*0404-DQB1*0302. This pattern has some similarities with the pattern found in Qatari children and youths with T1DM (6).

Taken together, such marked variation in incidence trends is consistent with an etiologic understanding of T1DM as a disease that involves environmental triggers acting with genetic susceptibility to initiate autoimmune destruction of pancreatic β-cells. It would be of great interest to investigate to what degree genetic determinants influence the well-known regional differences in incidences, since we can identify environmental risk factors that may either initiate the autoimmune process or promote already ongoing β-cell damage in different countries.

An increased prevalence of β-cell autoimmunity [anti-glutamic acid decarboxylase (GAD) antibodies (Ab), anti-islet cell Ab (ICA) and anti-insulin Ab (IAA)] was found in Qatari children and adolescents with T1DM in the 2020 compared to 2012 -2016 (82.7% vs. 75.5%; p: 0.009). This could be related to an increased autoimmune aggression secondary to environmental inciting factor/s, larger number of screened antibodies performed in recent years, and different age range of subjects included in the different studies (from 0.5 to 14 years in the 2016 to 0.5- 18 years in the 2020).

In conclusion, data from the Arab gulf showed a markedly increasing trend in the incidence of T1DM in children and adolescents over the last two decades. The high and increasing prevalence of positive autoimmunity as well as the genetic susceptibility evidenced by the inheritance of HLA susceptible loci can explain the high incidence and increasing trend in the Arab gulf population. In Qatari children with T1DM, an association of HLA haplotypes DQA1*03:01:01G (OR = 2.46; p: 0.011) and DQB1*03:02:01G (OR = 2.43; p value: 0.022) has been identified. Moreover, additional risk factors such as obesity, rapid urbanization and its associated changes in dietary habits and lack of physical activity are also important. Epidemiological studies are necessary to identify risk determinants that may be useful for primary prevention strategies

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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