Correspondence

Incidence trends of childhood type 1 diabetes in eastern Saudi Arabia

To the Editor

I have 4 comments on the interesting study by Abduljabbar et al[1] on the incidence trends of childhood type 1 diabetes in eastern Saudi Arabia.

First, the stepwise increase in the prevalence of childhood type 1 diabetes mellitus (T1DM) in eastern Saudi Arabia as stated by Abduljabbar et al[1] supports the countrywide increasing prevalence of T1DM. Abduljabbar et al[1] failed to address factors possibly contributing to that trend. However, I presume that the complex genetics-environment interaction could explain that trend through considering the following variables: 1. The accelerator hypothesis has gained popularity in explaining the growing magnitude of both types of DM worldwide. The theory argues that T1DM and T2DM are the same disorder of insulin resistance set against different genetic backgrounds. It identifies 3 processes which variably accelerate beta cell loss: constitution, insulin resistance, and the immune response to it. None of the accelerators leads to DM in the absence of weight gain, a trend which the hypothesis deems central to the rising incidence of all DM in the industrially developed and developing world. Weight gain causes an increase in insulin resistance, which results in the weakening of glucose control. The rising blood glucose accelerates beta cell apoptosis (glucotoxicity), and by increasing beta cell immunogenicity, further accelerates apoptosis in a subset genetically predisposed to an intense immune response.[2] 2. There is a growing literature supporting the hypothesis that excess weight gain during childhood may be a risk factor for early manifestation of T1DM. The increasing trend in the magnitude of T1DM in pediatric age group in Saudi Arabia might parallel the escalating trend in the reported prevalence of obesity[3] secondary to changing nutritional habits and affluent lifestyles. 3. Early exposure to cow's milk proteins have been implicated in the pathogenesis of T1DM. The expanding trend towards bottle feeding in developing countries including Saudi Arabia is distressing. A recent Saudi study showed that the prevalence of breastfeeding initiation at birth was 91.6%, and delayed beyond 6 hours after birth in 28.1% of the infants. Bottle feeding was introduced by one month of age in 51.4%, and 90% by 6 months of age.[4] 4. T1DM is associated with a wide spectrum of susceptibility and protective genotypes within the human leucocyte antigen (HLA) class II system. Despite that, it was found that increasing environmental exposure is now able to trigger T1DM even in subjects who are less genetically susceptible.[5] 5. The cumulative effects of increased awareness of pediatricians and public on T1DM, judicious use of laboratory test to precisely diagnose T1DM, and effective registration of newly diagnosed diabetic cases should not be overlooked.

Second, Abduljabbar et al[1] stated that there was a female preponderance (55%) in the studied population despite the fact that boys and girls have equal risk of having T1DM. Internal factors related to the gender rather than differences in the exposure to environmental factors seem to explain the male-female bias in the risk of developing T1DM.[6]

Third, considering that diabetic ketoacidosis (DKA) is the initial presentation of T1DM in 25-40% of cases, the prevalence of DKA (40%) addressed by Abduljabbar et al[1] constitutes the upper limit of that range. This upper limit prevalence might indicate that there were difficulties in diagnosing T1DM making DKA a significant cause of clinical presentation, particularly in young age group. It was noticed that children with T1DM overall have more medical encounters before diagnosis than control subjects, and children with DKA were less likely to have relevant laboratory testing before diagnosis than children with T1DM without DKA.[7] These data have important implications for enhancing public and pediatricians' awareness of T1DM in children.

Fourth, regular epidemiologic surveillance of T1DM and promotion of diabetes registration system are needed. This obviously helps target efforts against potential risk factors with the objective of ameliorating or lessening the long-term complications of T1DM.

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Reply from the Author

We thank Prof. Al-Mendalawi for his valuable comments. The rise in incidence of type 1 diabetes is a worldwide phenomena and not particular to Saudi Arabia. There are several theories to address the environmental and lifestyle contribution to pathogenesis of type 1 diabetes but none of these factors have been proven to be a major contributor so far. We do not believe that the accelerator hypothesis, or the increase in prevalence of overweight and obesity explain the

increased incidence of type 1 diabetes in children. In our practice, the majority of children diagnosed with type 1 diabetes are not overweight or obese even after correction for the weight loss that occurs at the time of initial presentation. The female preponderance was too small to make any major conclusions, and does not seem to be a consistent finding in epidemiological studies of type 1 diabetes.

We agree that efforts are needed to decrease the percentage of patients presenting with DKA which can be achieved by educating the public and the primary care pediatricians and general practitioners to recognize signs and symptoms of diabetes to achieve early diagnosis before development of DKA. We also agree on the need for registries to keep accurate data on the changing incidence of type 1 diabetes and the need for more research to study the environmental contribution to the pathogenesis of this chronic disease.

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