

Trends of Seasonality and Age of onset in T1DM: A snapshot from Eastern India

Sir,

Type 1 diabetes mellitus (T1DM) has a variable preclinical phase often extending over months. Studies on seasonal variation in clinical onset of T1DM, mostly reported from Scandinavian countries suggest that initial presentations may be more common during winter months.^[1] Studies on “age of onset” and the occurrence of T1DM have conflicting reports. However, only a few studies demonstrated an association between season of birth and the onset of T1DM. A Greek study documented that children having T1DM are more likely to be born in spring-summer as compared to autumn-winter.^[2] The impact of seasonality on the causation of the disease has not yet been established consistently.

We analyzed data available from our clinic registry to elicit the association of season of birth with the “onset of disease” in T1DM. Subjects were selected from the registry of Pediatric Diabetes Clinic, IPGME &R, Kolkata enrolled from 2010 to 2017. The date of first insulin injection was taken as an operational definition of the date of the clinical onset of diabetes.^[3] Data for 99 children were available for analysis. After obtaining informed consent from parents and assent from the children, parents were interviewed and the date of birth was verified from the “birth certificate.” Season of onset of disease and season of birth were analyzed according to four major seasons i.e., summer (March to May), monsoon (June to August), autumn (September to November), and winter including spring (December to February). One sample Chi-square test was applied.

The onset of T1DM was more common in winter (29.3%) followed by summer (28.3%), autumn (23.2%), and monsoon (19.2%). The differences in “season of onset” were not statistically significant.

A child with T1DM was much more likely to be born in autumn (36.4%) as compared to summer (23.2%),

winter (24.2%), and monsoon (16.2%) ($\chi^2 = 8.354$, $P = 0.039$)

The onset of T1DM is customarily taken as the time on which insulin injection was initiated but the initial trigger and clinical expression may vary. There is a variable period of insulinitis during which blood glucose is reasonably maintained (honeymoon phase). Multiple environmental insults may trigger autoimmune processes which may include viral infection, vitamin D deficiency, cold climate, dietary toxin, and early introduction of cow’s milk.

The onset of T1DM concerning “season of onset” was not significantly different from that reported by Ramachandran *et al.*^[4] The study concluded that in tropical countries like India impact of seasonal variation is less marked. Incidentally, it has been reported that several births in India in autumn are higher than in another season.^[5] This itself could explain part of the findings in our analysis. Alternatively, it may be due to some other unidentified factors.

The median age of onset of T1DM in our study population is 8 years (IQR: 5–12, Range: 2–17). The peak age of onset of disease was found in the age group 9–12 years and this corroborates with the existing literature. The analysis was done dividing the whole cohort into 5 groups as 3–6 years (23%), more than 6–9 years (26%), more than 9–12 years (30%), more than 12–15 years (18%), and more than 15–18 years (3%) ($\chi^2 = 9.53$, $P = 0.049$). The onset of T1DM seems to peak just before the onset of puberty. Puberty involves doubling lean body mass, increased insulin resistance,^[6,7] certain behavioral changes, and psychological issues; which may contribute additive stress on beta cells leading to a breakdown of immune tolerance and subsequent transition from preclinical phase to the clinical phase of T1DM.

This registry-based survey suggests that there might have been a relation between T1DM with the season of birth. However,

this needs to be validated by larger studies and in other ethnic groups.

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Conflicts of interest

There are no conflicts of interest.

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