The Coincidence of Newly Diagnosed Type 1 Diabetes Mellitus with IgM Antibody Positivity to Enteroviruses and Respiratory Tract Viruses

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Introduction

Enteroviruses (EV), in particular, and respiratory viruses play a role in the pathogenesis of type 1 diabetes (T1DM) . Most enteroviruses exhibit tropism to islet cells. In experimental and epidemiologic studies, it has been shown that influenza viruses can affect islet cells [4, 5]. Moreover, viruses lead to beta cell destruction through indirect or direct pathways .

The onset time of T1DM exhibits seasonal variations [8]. The seasonal pattern coincides with the typical influenza season seen during the fall and winter season

The present study, the first to include seasonal variations in Turkey, has been designed to investigate the association between T1DM and multiple EV and respiratory tract viruses, which are postulated to be diabetogenic viruses.

Method

The study was carried out between September 2013 and October 2014 in Gaziantep Province, Southeast Turkey, retrospectively.
We included 40 children aged 1–16 years who were newly diagnosed with T1DM and 30 healthy children who had presented to pediatric policlinics during the same period.

The one-year period was classified into two groups

1- Seasons :
- **a)-** Fall/ winter (September to February)
- b)-Spring/summer (March to August)

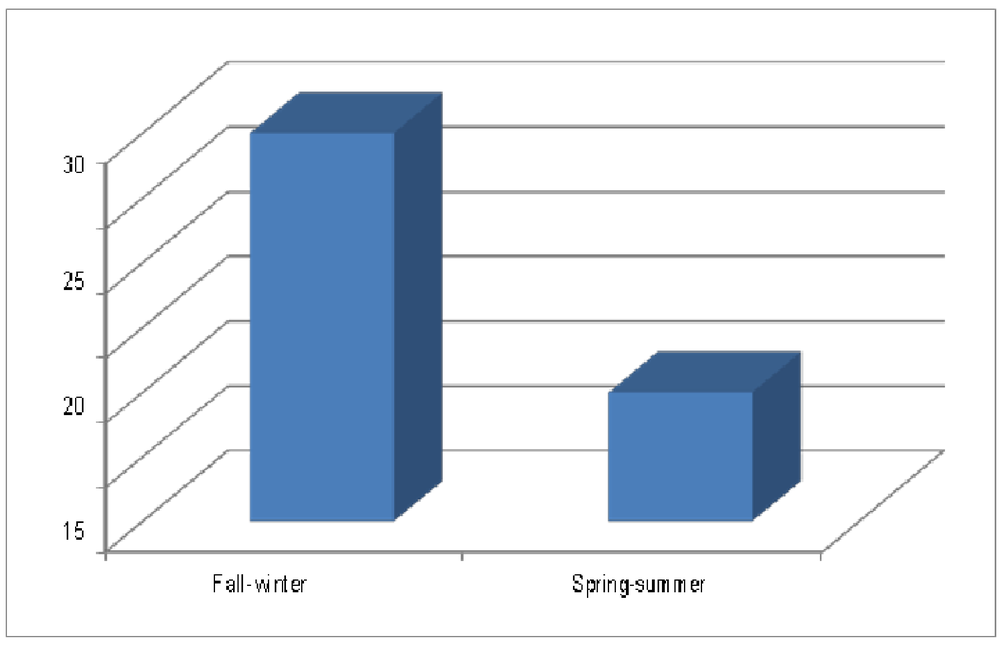
2- Months
- a)Cold (November, December, January, and February)
- b)Moderate (September, October, March, and April),
- c)Warm months (May, June, July, and August).

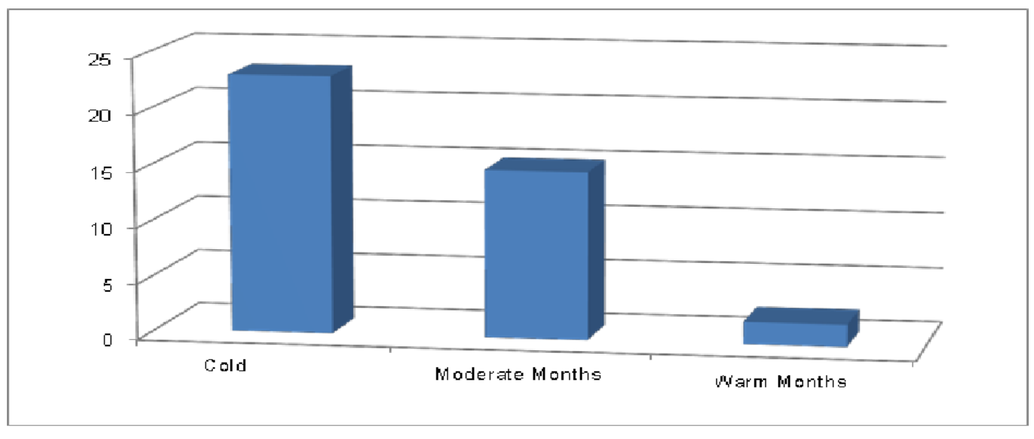
Studied viruses

Respiratory syncytial virus	**Parainfluenza type 1**
Adenovirus type 3	**Parainfluenza type 2**
Influenza virus type A (H1N1)	**Parainfluenza type 3**
Influenza virus type A (H3N2)	**Parainfluenza type 4**
Influenza virus type B	**Coxsackievirus type B1**
	Coxsackievirus type A7
	ECHO 7

Results

	Study Group *(n=40)*		Control Group *(n=30)*		
	Positive n (%)	*Negative n (%)*	*Positive n (%)*	*Negative n (%)*	*p*
Influenza A					
H1N1	0	40 (100)	0	30 (100)	
H3N2	9 (22.5)	31 (77.5)	1(3.3)	29 (96.7)	0.023*
Influenza B	28 (70)	12 (30)	8 (26.7)	22 (73.3)	?0.001*
Parainfluenza					
PIV1	No	40 (100)	No	30 (100)	
PIV2	1 (2.5)	39 (97.5)	1(3.3)	29 (96.7)	0.836
PIV3	No	40 (100)	No	30 (100)	
PIV4	16 (40)	24 (60)	5 (16.7)	25 (83.3)	0.035*
Coxsackie					
CVB1	3 (7.5)	37(92.5)	No	30(100)	
CAV7	11(27.5)	29(72.5)	No	30(100)	0.003*
ECHO7	18 (45)	22 (55)	1 (3.3)	29 (96.7)	?0.001*
AdV 3	3 (7.5)	37 (92.5)	No	30 (100)	0.125
RSV	2 (5)	38 (95)	1 (3.3)	39 (96.7)	0.733





Conclusion

Newly-diagnosed T1DM appears during the fall/winter season, during months when the temperature is cold or moderate,

and

coincides with seropositivity for both respiratory and enteroviruses including IVB, ECHO7, PIV4, CAV7, and H3N2.

These results suggest that respiratory viruses and enteroviruses may play a diabetogenic role in addition to the seasonality of the onset of clinical manifestation of T1DM.