

Incidence of Type 1 Diabetes among Korean Children and Adolescents in 2012-2014: Analysis of Data from the Nationwide Registry of Korea

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Background

The incidence of type 1 diabetes mellitus (T1DM) in children and adolescents has increased worldwide. However, the epidemiology of T1DM among Korean children has not been reported since 2001.

Objective and hypothesis

We therefore investigated the incidence of T1DM in Korean children and adolescents in 2012–2014 and compared it with data from 1995–2000.

Methods

Children and adolescents <15 years who were newly diagnosed with T1DM during 2012–2014 and registered in the National Health Insurance Service (NHIS) in Korea were included in our study.

Inclusion criteria for registering patients with T1DM in the NHIS were being on insulin treatment plus having one or more of the following clinical characteristics: fasting serum C-peptide levels ≤ 0.6 ng/mL, stimulated serum C-peptide levels ≤ 1.8 ng/mL, 24-h urine C-peptide levels < 30 μ g, diabetic ketoacidosis (DKA) at diagnosis, or autoantibody positivity (e.g., anti-glutamate decarboxylase antibody, insulin antibody, or islet cell antibody). Patients with type 2 diabetes (including those who met the aforementioned criteria) were excluded.

To compare time trends of T1DM incidence, the incidence data were compared to those from a previous study by the Korean Pediatric Society that used the same inclusion criteria (1995–2000).

Results

Table 1. Patients' clinical characteristics

Year	2012	2013	2014	Total
Number (M:F)	229 (106:123)	233 (107:126)	244 (113:131)	706 (326:380)
M:F ratio	1:1.16	1:1.18	1:1.16	1:1.17
Age group				
0–4 yr	28 (12.2%)	39 (16.7%)	49 (20.1%)	116 (16.4%)
5–9 yr	69 (30.1%)	75 (32.2%)	72 (29.5%)	216 (30.6%)
10–14 yr	132 (57.7%)	119 (51.1%)	123 (50.4%)	374 (53.0%)
Diabetic ketoacidosis at diagnosis	77 (33.6%)	95 (40.8%)	108 (44.3%)	280 (39.7%)
Decreased C-peptide levels	167 (72.9%)	171 (73.4%)	174 (71.3%)	512 (72.5%)
Autoantibody positivity	110 (48.0%)	115 (49.3%)	130 (53.3%)	355 (50.3%)
Season (spring/summer/fall/winter)	49/57/52/71	59/54/52/68	68/63/52/61	176/174/156/200

Table 2. Incidence of type 1 diabetes among Korean children and adolescents from 1995–2000 and 2012–2014 by sex and age group

Age group	Sex	Incidence rate per 100,000 per year (95% CI)		Incidence rate ratio (95% CI)
		1995–2000	2012–2014	
0–4 years	Male	0.67 (0.55–0.80)	1.38 (1.02–1.82)	2.04 (1.39–2.97)*
	Female	0.79 (0.68–0.89)	2.00 (1.55–2.55)	2.56 (1.82–3.61)*
	Total	0.73 (0.62–0.81)	1.68 (1.39–2.02)	2.31 (1.80–2.97)*
5–9 years	Male	1.14 (0.97–1.30)	2.69 (2.17–3.28)	2.35 (1.78–3.11)*
	Female	1.75 (1.46–2.04)	3.66 (3.04–4.37)	2.08 (1.63–2.64)*
	Total	1.43 (1.21–1.64)	3.16 (2.75–3.61)	2.20 (1.84–2.64)*
10–14 years	Male	1.47 (1.15–1.80)	4.16 (3.58–4.81)	2.87 (2.30–3.58)*
	Female	2.53 (2.18–2.89)	4.79 (4.14–5.52)	1.90 (1.56–2.30)*
	Total	1.98 (1.72–2.24)	4.46 (4.02–4.94)	2.27 (1.97–2.62)*
0–14 years	Male	1.07 (0.96–1.18)	2.84 (2.54–3.17)	2.62 (2.25–3.06)*
	Female	1.67 (1.50–1.85)	3.56 (3.22–3.94)	2.11 (1.84–2.42)*
	Total	1.36 (1.23–1.48)	3.19 (2.96–3.43)	2.33 (2.10–2.58)*

*P<0.001

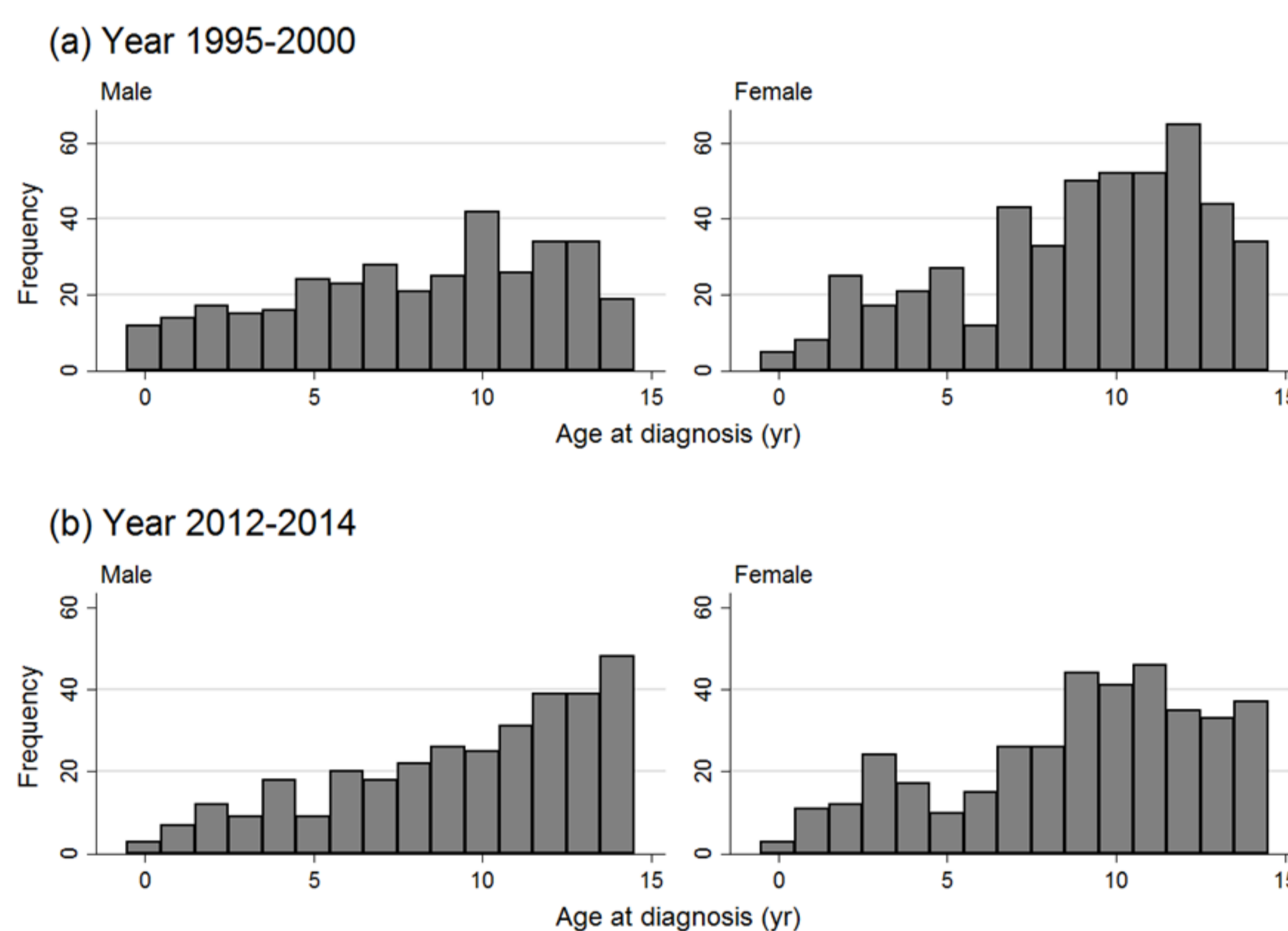


Fig. 1. Patient distribution according to age at diagnosis of type 1 diabetes by sex and year at diagnosis

Conclusion

This study provided recent data on the incidence of T1DM in children aged <15 years in Korea. We showed a 2.33-fold increase in T1DM incidence during 1995–2000 and 2012–2014. This increase was higher in boys than in girls, and was highest in children 0–4 years. It is necessary to investigate the incidence of T1DM between 2001 and 2011 and evaluate the long-term epidemiological trend of T1DM incidence.

Disclosure statement

Nothing to declare

Notice

This study is in press.

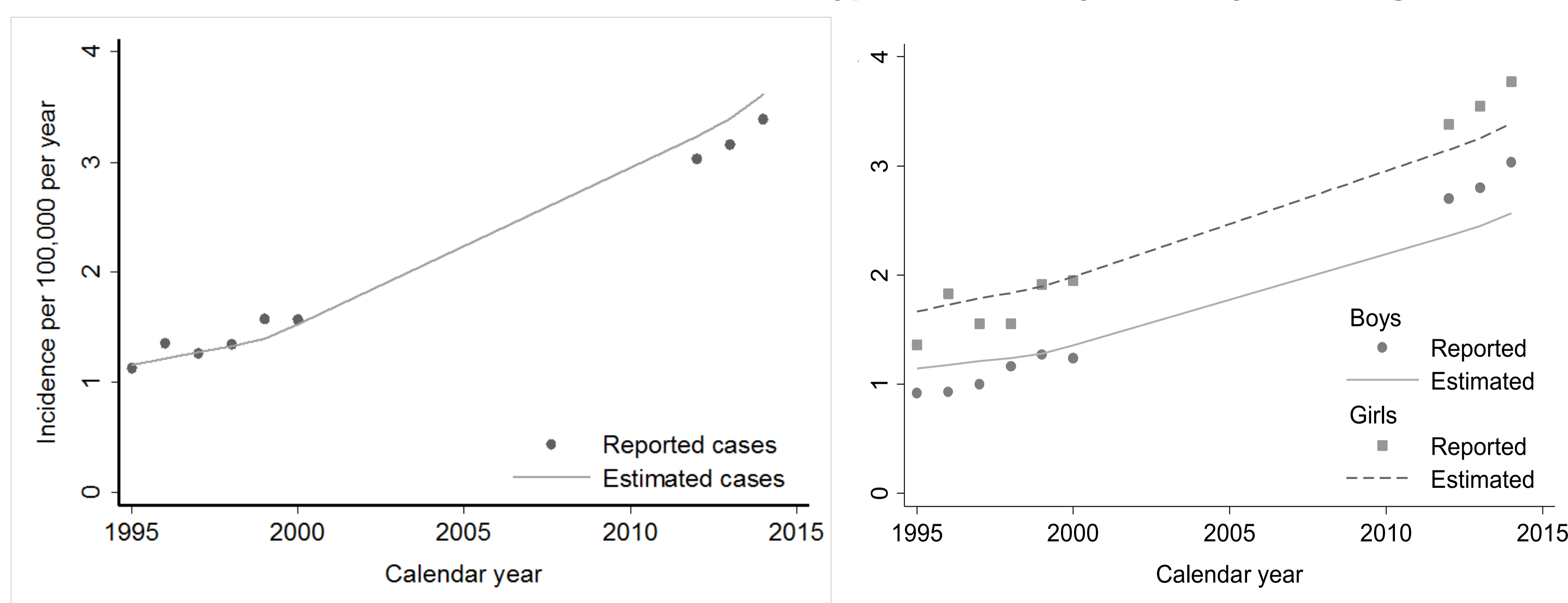


Fig. 2. Incidence of type 1 diabetes mellitus in children and adolescents <15 years in Korea

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