

Improvement of diabetic screening system for school children by close cooperation with the local government of Atsugi-city

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BACKGROUND

- The significance of the urine glucose screening system at school is the early diagnosis of childhood-onset diabetes mellitus (DM) and early intervention.
- The urine glucose screening program for school children has been carried out since 1992 on a nationwide scale in Japan.
- Screening system and management of school children positive for urine glucose differ between the local governments in Japan.

OBJECTIVE

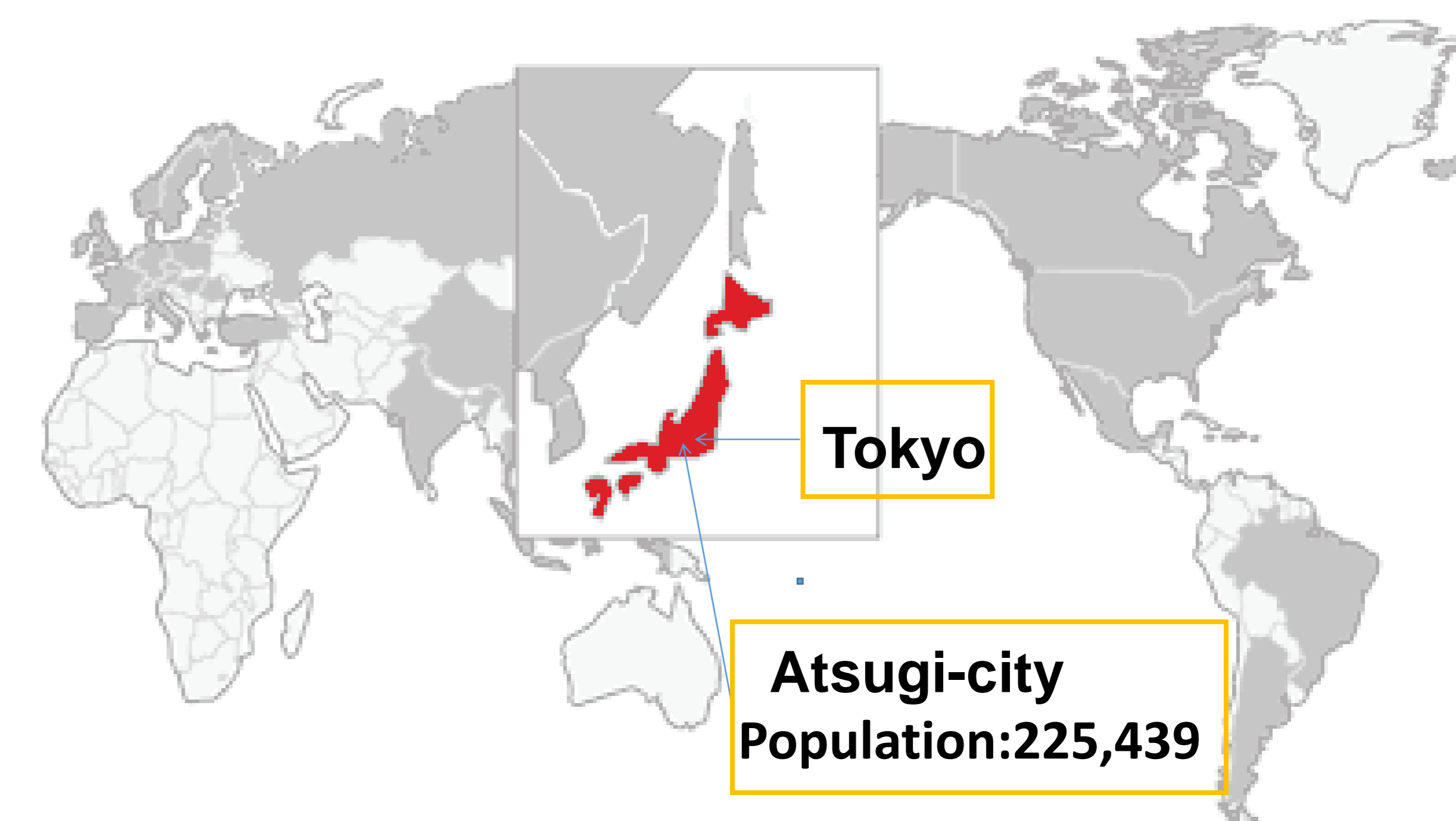
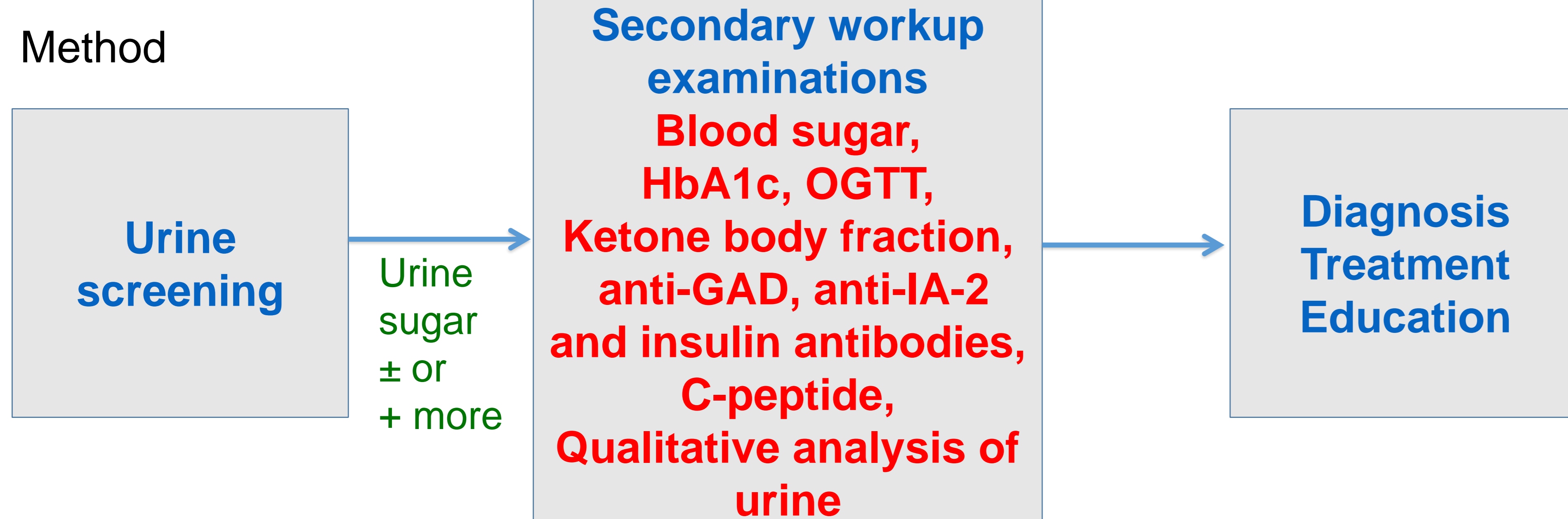
To clarify the actual current situation of school children who test positive for urine glucose at schools in Atsugi-city

SUBJECTS AND METHODS

Subjects were 36 school children who tested positive for urine glucose at school in the seven-year period from 2009 through 2015 in Atsugi-city. Secondary workup examinations were performed on these children at our hospital. In addition, we retrospectively analyzed their clinical diagnoses and management.

Flow of urine glucose screening program for school children aged 6-15 years in Atsugi-city, 2008-2015

Map of Atsugi-city



RESULT 1

Childhood diabetes found by school urine glucose screening in Atsugi-city

Fiscal year	Practitioner of urine test	Precision test subjects	Practitioner of precision inspection	Type 1 diabetes	Type 2 diabetes	Insulin receptor abnormality
2009	18,863	5	5	0	1	0
2010	18,857	7	7	0	1	0
2011	18,692	4	4	0	1	0
2012	18,458	4	4	0	0	0
2013	18,276	6	6	1	0	1
2014	18,140	4	4	0	0	0
2015	17,840	6	6	1	0	0
Total number	129,126	36	36	2	3	1

One girl was diagnosed as Rabson-Mendenhall syndrome. She has now been treated with recombinant IGF-1.

We found one boy before the onset of type 1 DM in secondary workup examinations. He is being followed-up at our hospital.

RESULT 2

Summary of results of urine glucose screening program in past seven years

- Average annual rate of positive urine glucose test results **0.0275%**
- Inspection rate at our hospital among school children positive for urine glucose after first urine screening **100%**
- Annual incidence rate of type 1 DM **1.58/100,000/year**
- Annual incidence rate of type 2 DM **2.28/100,000/year**
- Obesity rate among school children with type 2 DM **66.7%**

DISCUSSION

Incidence rate of type 2 DM by urine glucose screening at school in each local government

Local government (Implementation year)	Incidence rate (/ 100,000 / year)
Tokyo (1974~2010)	2.65
Niigata (1982~2003)	3.57
Yokohama (1982~2001)	3.19
Fukuoka (1989~1998)	2.77
Atsugi (This study)	2.28

Incidence rate of type 1 DM by urine glucose screening at school in Japan

1.5-2.5 (/ 100,000 / year)

Tajima N et al, *Pediatr Endocrinol Rev*, 2012;10:44-50

1.58 (This study)

Incidence rate of type 1 DM in Atsugi-city was similar with that reported in Japan of the whole. Incident rate of type 2 DM was not significantly different from that found in other local governments.

The urine glucose screening system at schools in Atsugi-city contributes to the early detection and follow-up of DM.

CONCLUSIONS

- ✓ All of the school children testing positive for urine glucose in Atsugi-city visited our hospital and received secondary workup examinations.
- ✓ Only one institution performed continuous follow-up of school children testing positive for urine glucose and gathered their clinical data under close cooperation with the local government.
- ✓ Generic guidelines, including educational activities, for patients and their families in cases testing positive for urine glucose are desirable in each local government of Japan.

The authors declare that there is no conflict of interest.