A Population Survey of Pancreatic Islet Cell Antibodies and Antithyroid Antibodies

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NOTSU, K., GOTO, Y., SAKURAMI, T., NOTE, S., NABEYA, N. and KUNO, S. *A Population Survey of Pancreatic Islet Cell Antibodies and Antithyroid Antibodies.* Tohoku J. exp. Med., 1983, 141, Suppl., 261-263 — In a survey of one Japanese population, we detected pancreatic islet cell antibodies (ICA), antithyroid antibodies (ATA) and antinuclear antibodies (ANA). The prevalence of ICA was 6 out of 1125 cases, or 0.5%. ATA and ANA were detected in 8.9% and 1%, respectively. There were no cases of either type I or type II diabetes in subjects with ICA. But there was one case who had ATA and another with ANA. Serum samples from this population had been obtained once a year from 1979 and one case with neither ATA nor ANA was found positive for ICA in 1980. Identical tests for ICA were performed on 80 childhood diabetics as were carried out on type I diabetics. Pancreatic islet cell surface antibodies (ICsA), ATA and ANA were studied simultaneously. The prevalence of ICA in 80 cases was 36.3% and that of ICsA was 13.8%. 4 cases had both ICA and ICsA. The prevalence of ATA was 11.2% and that of ANA was 16.3%. ——— pancreatic islet cell antibodies ; antithyroid antibodies.

Despite suspicion that autoimmunity might play an important role in insulin dependent diabetes mellitus, direct demonstration of autoantibodies directed against the pancreas has not been reported. However, the pancreatic islet cell antibodies (ICA) were detected in 1974 by Bottazzo, MacCuish, Irvine and their colleagues^{1,2}. Since then, we have strongly suspected that there is a close correlation between the occurrence of type I diabetes mellitus and autoimmunity. Accordingly, we studied the prevalence of ICA in a rural Japanese population group to ascertain whether antibodies correlated with levels of fasting blood glucose and the occurrence of type I diabetes mellitus. At the same time, antithyroid antibodies (ATA) and antinuclear antibodies (ANA) were also studied.

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SUBJECTS AND METHODS

Mass screening in Daiwa Village, Shimane Prefecture in Japan had been performed once a year since 1979. Serum samples were obtained from 1242 cases, 570 male cases and 672 female cases, in July, 1981. The mean age of the population group was 54.7 years. Although all 1242 cases were checked for ATA, ICA and ANA were studied in only 1125 cases because of the small quantity of serum obtained from the remaining 117 cases.

The fresh human pancreas of blood type O and the standard indirect immunofluorescence technique were used to detect ICA and ANA. Thyroid microsomal antibodies as ATA were measured by the tanned red cell hemagglutination technique, using commercially available kits, Microsome Test by Fuji Zoki Co., Ltd. Tokyo Japan.

RESULTS

The prevalence of ICA in the population group was 0.5%. The patterns of ICA showed diffuse reactivity over the pancreatic islet cells and were said to be "classical" patterns. 111 cases (8.9%) were positive for ATA and 12 cases (1.1%) were positive for ANA (Table 1). Table 2 summarizes the cases with ICA. Case 1 had ATA and case 2 had ANA. Case 3 was positive for ICA in 1980 but was not tested in 1979. However, these 6 cases suffered from neither type I nor type II diabetes mellitus.

Identical tests for ICA were performed on 80 childhood diabetics who were

TABLE 1. *Prevalence of ICA, ATA and ANA in one population group*

	Number of cases studied	Number of cases with antibodies	Incidence (%)
ICA	1125	6	0.5
ATA	1242	111	8.9
ANA	1125	12	1.1

ICA, pancreatic islet cell antibodies; ATA, antithyroid antibodies; ANA, antinuclear antibodies.

TABLE 2. *Summary of cases with pancreatic islet cell antibodies*

No.	Age	Sex	ICA			ATA	ANA	FBS (mg/100 ml)
			1979	1980	1981			
1	45	F	n.t.	n.t.	(+)	(+)	(-)	98
2	72	M	n.t.	(-)	(+)	(-)	(+)	93
3	33	M	n.t.	(+)	(+)	(-)	(-)	97
4	53	F	(-)	(-)	(+)	(-)	(-)	84
5	57	F	(-)	(-)	(+)	(-)	(-)	99
6	64	M	(-)	(-)	(+)	(-)	(-)	91

ICA, pancreatic islet cell antibodies; ATA, antithyroid antibodies; ANA, antinuclear antibodies; n.t., not tested.

between 7 and 18 years old. The prevalence of ICA in this group was 36.3% and the patterns were "classical" in all cases with ICA. On the other hand, ICsA, which were studied by Mr. Maruyama in BML, Tokyo, Japan, were detected in 11 cases. 4 cases had ICA and ICsA. The prevalence of ATA in 80 cases was 11.2% and that of ANA was 16.3%.

DISCUSSION

The prevalence of ICA in population groups of other countries found to range from 0.1% to 1.7%. Our survey shows that the prevalence of ICA in the Japanese population group was not lower than that in other studies. However, as our population study shows, non diabetic subjects were also positive for ICA. Irvine and his colleagues showed that ICA positive diabetics initially administered oral hypoglycemic agents or treated by diet alone required insulin after a few years³. We do not know whether non diabetic subjects with ICA will develop type 1 diabetes in the future.

Bottazzo and his colleagues said that classic ICA, when associated with thyrogastric autoimmune disease, had been shown to be persistent and of high titer⁴. In our survey, case 1 with ATA was not studied ICA in 1979 and in 1980, when mass screening was also performed. We intend to check for the titers and the patterns of ICA in these cases. At any rate, there may be a need for careful observation of these cases for the next several years.

References

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