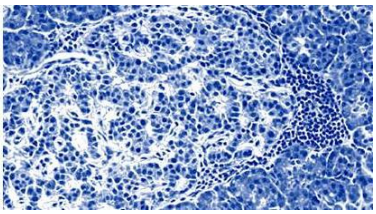
nPOD
Network for Pancreatic Organ Donors with Diabetes



Enterovirus RNA detected in the pancreatic islets isolated from a type 1 diabetic organ donor in the nPOD study

AUTHORS

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PURPOSE

In the nPOD-Islet Isolation Program, islets are recovered from individuals with type 1 diabetes (T1D) having a disease duration of < 3 years, with aims including characterizing the existing knowledge gaps in T1D development. Enteroviruses have been linked to the development of T1D in multiple studies, however, individual/isolated islets of T1D patients with short disease duration have not been widely studied.

METHODS

Islets were isolated from a nPOD donor 6480 (male, 17 yrs), with T1D duration of 2.5 years, as part of nPOD-IIP. The cause of death was ketoacidosis and the patient had several insulin containing islets. Isolated islets were subsequently co-cultured with cell lines that are permissive for enteroviruses for 15 days at Baylor College of Medicine (BCM). Culture supernatants and cultured cell specimens collected at several timepoints were analyzed for the presence of enterovirus RNA using sensitive RT-PCR independently in two virus laboratories (BCM and Tampere University).

SUMMARY OF RESULTS

Enterovirus RNA was detected in the cultured islets in both laboratories. The Tampere laboratory found virus in six samples taken at different time points during the culture and also obtained enterovirus-specific sequence in four of them. The BCM laboratory found enterovirus in eight samples and recovered virus sequence from four. The sequences were varied, matched best with coxsackievirus B3, echovirus 13 and EVA71 Genbank submissions, but reliable identification of the virus serotypes was not possible using highly conserved 5’ UTR sequences.

CONCLUSIONS
The results suggest that enterovirus RNA was present in the pancreatic islets of this T1D patient, likely representing multiple enteroviruses. The results are in agreement with previous studies showing enterovirus proteins in the pancreatic beta cells in T1D patients.