JOURNAL OF INTERDISCIPLINARY HISTOPATHOLOGY, 2022
VOL 10, NO. 11, PAGE 01-02

PERSPECTIVE

Open Access

Pathology of the Pancreas in Type 1 Diabetes: Implications for Future Research

Mark Burg-Thompson*
Department of Pathology, University of Florida, Gainesville, USA

ARTICLE HISTORY
Received: 28-Oct-2022, Manuscript No. EJMJIH-22-77159; Editor assigned: 31-Oct-2022, PreQC No. EJMJIH-22-77159 (PQ); Reviewed: 14-Nov-2022, QC No. EJMJIH-22-77159; Revised: 21-Nov-2022, Manuscript No. EJMJIH-22-77159 (R); Published: 28-Nov-2022

Description

Our understanding of type 1 diabetes pathogenesis has greatly improved thanks to the availability of human pancreas samples from organ donors; however, prior research has shown that donors have a high rate of substance use, and its effects on pancreatic histopathology in this disease are not well described. In the Network for Pancreatic Organ Donors with Diabetes (nPOD), 141 type 1 diabetes and 111 control organ donor pancreata from people 12-89 years of age were investigated for insulin positive, insulates, amyloid staining, acute and chronic pancreatitis, and chronic exocrine alterations results [1].

Regardless of past substance use, a secondary investigation examined exocrine pancreatic histopathologic findings in type 1 diabetes to control organ donors. We found that both organ donors with type 1 diabetes and control donors had high but comparable rates of drug use [2]. Organ donors with type 1 diabetes who use alcohol or cocaine experience an increase in exocrine pancreatic pathology and islet amyloid deposition, but not insulitis or insulin positivity. Exocrine pathology is typical in type 1 diabetes donors, and further research is required to understand the pathophysiology of these modifications.

Insulitis and numerous other islet-related characteristics of type 1 diabetes have been widely studied using human pancreata from the Network for Pancreatic Organ Donors with Diabetes (nPOD) initiative. In addition, research on the exocrine pancreatic alterations in people with this condition has drawn more and more attention. The nPOD Organ Procurement and Pathology Core prepared human pancreas for fixed paraffin samples. Four-micron paraffin slices were deposited on a Super frost Plus slide from two blocks of each accessible location. Standard techniques were followed when staining pancreatic slices that had been formalin fixed and embedded in paraffin with H&E and immunocytochemistry. Slides were scanned using an Aperio CS whole slide digital scanner at a magnification of 20x, and histopathology images were examined using the nPOD online pathology database.

Histopathologic Alterations in Relation to Substance Abuse For categorical and continuous data, respectively, Pearson's 2 and t-tests were used to compare the demographics of type 1 diabetes donors with control donors, including sex, race/ethnicity, BMI at death, and drug use rates. For the general population, type 1 diabetes, and control groups, Odds Ratios (OR) for rate of any histologic change within each substance use group were calculated, both unadjusted and adjusted for age at death. Comparing Type 1 Diabetes Donors to Control Donors for Histopathological Changes. A further investigation was justified since it was reported descriptively that many donors with type 1 diabetes exhibited histological proof of acute and chronic pancreatitis in addition to other chronic exocrine alterations. Because acute pancreatitis is known to be associated with DKA, Pearson's 2 was used to assess the histologic alterations in donors with type 1 diabetes versus controls before and after removing donors with DKA suspicion [3].

Probabilities of histopathologic alterations by substance use

The likelihood of having histopathologic alterations did not rise with use of alcohol, tobacco, marijuana, or illegal drugs. Substance usage had no impact on insulin positive or insulates when evaluating individual histologic alterations. However, among type 1 diabetes

Contact: Mark Burg-Thompson, E-mail: Thompsonb@ufl.edu

donors, chronic exocrine alterations and islet amyloid deposition were more frequently observed in alcohol and cocaine users, respectively. Acute pancreatitis was observed more frequently in type 1 diabetes donors who consumed alcohol, although this link disappeared when donors with DKA were excluded [4].

Pathways underlying these reported relationships should continue to be revealed by ongoing research on the exocrine pancreas' role in the pathophysiology of type 1 diabetes. It is also necessary to conduct targeted prospective mechanistic investigations to assess how cocaine and alcohol usage affect exocrine pancreatic function and islet amyloid polypeptide secretion [5].

References

[1] Lewis D, van den Heuvel C, Kenneally M, Byard RW. Methamphetamine use and the risk of diabetic ketoacidosis. Med Sci Law 2022;62: 39-42.

[2] Chapela SP, Paz SLA, Ballestero FM. Pancreatitis Induced by Cocaine. Case Rep Gastroenterol 2017;11: 212-218.

[3] Lankisch PG, Apte M, Banks PA. Acute pancreatitis. Lancet 2015;386: 21–27.

[4] Campbell-Thompson ML. Organ donor specimens: What can they tell us about type 1 diabetes?. Pediatr Diabetes 2015;165: 320–330.

[5] Barkin JA, Nemeth Z, Saluja AK, Barkin JS. Cannabis-induced acute pancreatitis: A systematic review. Pancreas 2017;46: 1035–1038.