HYPOTHESIS

# Clinical Presentations of Rare Pancreatic Neuroendocrine Neoplasms (panNENs)

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**ABSTRACT**

Pancreatic Neuroendocrine Tumours (pNET) are a type of cancer that can develop in the pancreas' hormone-producing cells. Islet cell malignancies, commonly known as pancreatic neuroendocrine tumours, are extremely rare. This condition generates benign pancreatic tumours that can occasionally turn cancerous. It can also cause parathyroid gland dysfunction. This can lead to kidney stones, pituitary gland tumours, and serious stomach ulcers. Pancreatic Neuroendocrine Tumours (NETs), also known as islet cell tumours, are cancers that begin in the pancreas. Pancreatic NETs are a rare form of pancreatic cancer.

## INTRODUCTION

Increased calcitonin levels in the blood can help in the diagnosis of medullary thyroid cancer. Hypercalcitoninemia, on the other hand, can be linked to other clinical diseases, such as pancreatic neuroendocrine neoplasms (PanNENs). Ectopic hormone production is common in both functional and non-functional PanNENs; however, little is known regarding the prevalence of calcitonin expression in these neoplasms. To analyse the clinicopathological and prognosis aspects of calcitonin-immunoreactive (Cal-IR) PanNENs, including a comparison with cases previously reported in the literature, and to assess the prevalence of calcitonin immunoreactivity in PanNENs independent of blood calcitonin levels. We looked for immunohistochemistry expression of calcitonin in 229 PanNENs, encompassing both functioning and non-functioning neoplasms, as well as well-differentiated and poorly differentiated PanNENs. The clinicopathological and follow-up data were both accessible and were compared to the immunohistochemistry results [1].

CT and MRI are critical imaging modalities in the diagnosis of pancreatic disorders. They provide a thorough understanding of the normal and pathological structural, as well as functional, aspects of the pancreas and its surroundings. As a result, most pancreatic disorders may be diagnosed and characterized using CT and MRI. The most prevalent findings-pancreatic adenocarcinoma and acute and chronic pancreatic inflammation-are usually easily diagnosed, and imaging aids in disease stage and spotting potential consequences. Furthermore, current imaging allows for the distinction of nonneoplastic, developmental problems, solid, cystic, localized, and diffuse parenchymal findings ranging from neoplasia-like to real neoplasia to inflammatory tumor-like alterations, which is critical for guiding proper therapy [2].

Pan-NENs are uncommon yet clinically significant lesions. Pan-NENs are well-known and frequently classified for their ability to generate clinical syndromes mediated by hormone production. Despite the fact that Pan-NENs might manifest dramatically as a result of excessive hormone production, not all Pan-NENs produce functional hormone, and thus can pose diagnostic issues to practicing pathologists. Because Pan-NENs have various prognoses and treatments available due to their specific biological features, distinguishing them from imitation can be critical. This article examines the current taxonomy and characteristics of Pan-NENs [3].

A review of pancreaticoduodenectomies for nonfunctioning PanNENs was conducted. It is unknown which nodal staging is best for PanNENs. The study's goal was to see how the number of positive lymph nodes affected PanNEN prognosis following pancreaticoduodenectomy. The presence of necrosis, lymph node ratio, and nodal status were all independent predictors of disease-free survival. The number of positive lymph nodes accurately predicts PanNEN recurrence. Thirteen lymph nodes appear to be the minimal number of lymph nodes evaluated in patients undergoing pancreaticoduodenectomy for PanNENs.

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Pancreatic neuroendocrine neoplasms (PanNENs) are uncommon tumours of the endocrine pancreas; nonetheless, their prognosis varies greatly depending on their proliferative state, which is determined by histological grading. MiRNAs are short noncoding RNAs that regulate gene expression post transcriptionally. Our goal was to find miRNAs that change expression during proliferation and can be exploited as prognostic biomarkers in PanNENs [4].

MiRNA expression profiles of 40 PanNENs were obtained from Gene Expression Omnibus and reanalyzed based on tumour grade (discovery cohort). qRT-PCR study of five miRNAs on an independent validation cohort of 63 initial PanNEN samples corroborated the reanalysis results. To assess the influence of miRNAs on progression-free and overall survival, Cox proportional hazards survival regression models were fitted for both univariate and multivariate analysis. The expression of hsa-miR-106b, hsa-miR-10a, and especially hsa-miR-21 has predictive significance in patients with PanNENs in terms of progression-free and overall survival. There was a difference in the expression of 19 miRNAs between tumour grades. Three of the five miRNAs tested positive for changed expression; hsa-miR-21, hsa-miR-10a, and hsa-miR-106b were upregulated in more proliferative PanNENs compared to Grade 1 tumours. Higher expression of tissue hsa-miR-21, hsa-miR-10a, and hsa-miR-106b of primary PanNENs predicted shorter progression-free and overall survival in univariate analysis; however, multivariate analysis only confirmed hsa-miR-21 expression as an independent prognostic factor [5].

## CONCLUSION

Our findings suggest that calcitonin immunoreactivity is not an unusual occurrence in PanNENs. Furthermore, calcitonin expression does not distinguish a different clinical entity from other PanNENs with ectopic hormone synthesis, such as adrenocorticotropic hormone (ACTH)-producing PanNENs, which exhibit a much more aggressive behaviour.

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