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Preliminary study of *POU1F1* (Pit1) gene expression in lactotroph and thyrotroph neuroendocrine tumours

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Introduction

The last World Health Organization (WHO) 2016 classification of Pituitary Tumours recommends the determination of transcription factors. During the last few years, silent variants of the main pituitary tumours (PTs) have been described. The mechanisms of silencing of these tumors are still unknown. *POU1F1* (Pit1) encodes a member of the POU family of transcription factors that has a relevant role in the differentiation, proliferation and survival of three pituitary cell types: somatotroph, lactotroph and thyrotroph lineage. It regulates the expression of GH, PRL and TSH-beta in the anterior pituitary gland.

Aim

To analyze the gene expression of *POU1F1* in a series of lactotroph and thyrotroph tumours, both functioning and silent, in order to observe if there are differences between the functioning and silent variants in both subtypes.

Material and Methods

We selected 24 samples of PTs (7 functioning lactotroph (FLT), 5 silent lactotroph (SLT), 3 functioning thyrotroph (FTT) and 9 silent thyrotroph (STT)) from our collection of 258 PTs. The tumours were previously molecularly identified on the basis of the expression of gene expression. Silent tumours were defined when the gene expression of PRL or TSHβ in the correspondent subtypes were similar to the respective functioning tumours, but without symptoms. The gene expression of *POU1F1* was performed using qRT-PCR with TaqMan probes. The data are expressed as the mean and standard deviation (SD) of the Fold Change (FC). The ANOVA test was used to analyze differences between functioning and silent tumours in both subtypes.

Results

There were no significant differences in the expression of *POU1F1* between LT and TT subtypes in the overall series (p=0.266) and between their respective silent or functioning tumours (p=0.797, p=0.267). FLT but not FTT expressed more *POU1F1* than their silent variants (p=0.036 and p=0.983, respectively) (Figure 1).

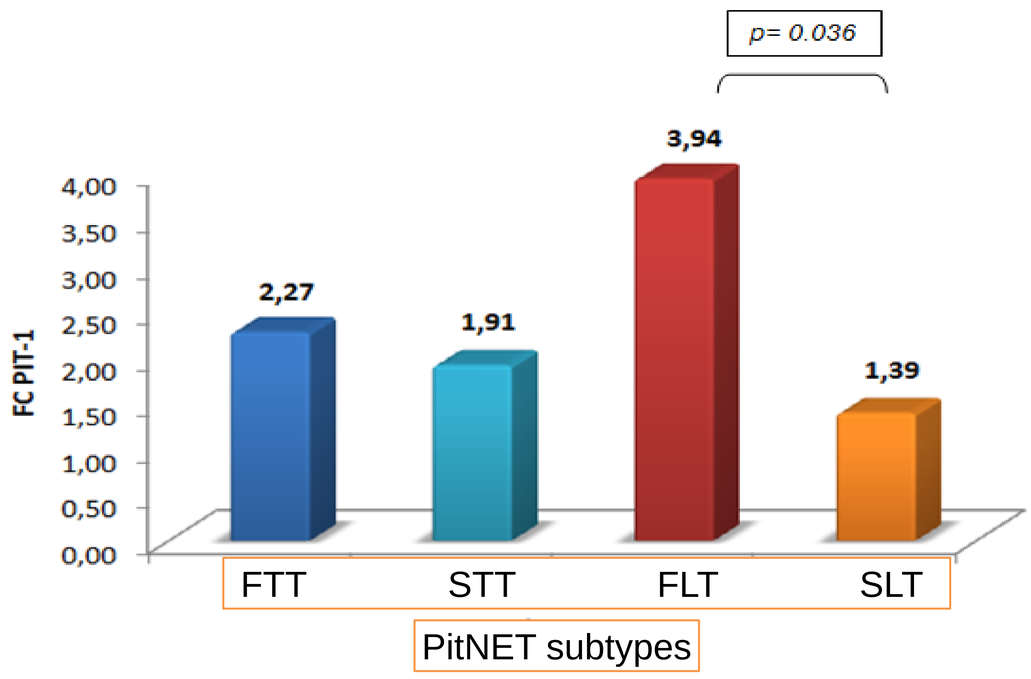

Figure 1. Differences in the expression of *POU1F1* (Pit1)among PitNET subtypes.

Conclusions

The lower expression of *POU1F1* in the silent variant of functioning lacto and thyrotroph tumours could contribute to the silencing of these tumours. The absence of statistical significance in TT could be attributed to the short number of analyzed tumours.

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