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

García-Martínez A1, Sotille J1, Fajardo C2, Cámara R1, Lamas C4, Torregrosa ME5, Aranda I6, Picó A1

1GVC13, Laboratory of Research Support and Endocrinology Service, Hospital General Universitario de Alicante-ISCIII
2 Endocrinology Service, Hospital La Ribera, Alzira
3 Endocrinology Service, Hospital Universitario y Politécnico La Fe, Valencia
4 Endocrinology Service, Complejo Hospital Universitario de Albacete
5 Clinical Analysis Service, Hospital General Universitario de Alicante
6 Pathology Service, Hospital General Universitario de Alicante

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 thyrotoph 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 thyrotoph 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 thyrotoph (FTT) and 9 silent thyrotoph (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 TSHB 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).

Conclusions

The lower expression of *POU1F1* in the silent variant of functioning lacto and thyrotoph 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.

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

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