Somatotroph pituitary tumor signal intensity in T-2 weighted pituitary MR images- quantitative assessment of the parameter and its clinical implications in consecutive newly-diagnosed patients with acromegaly

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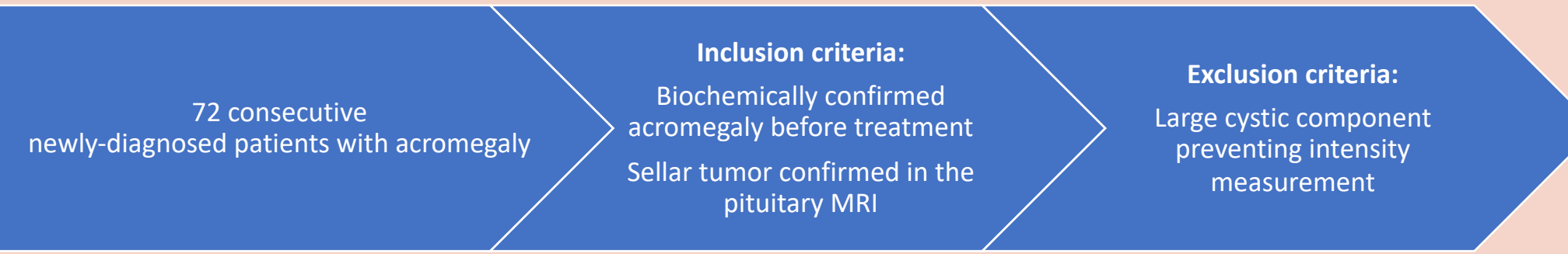
Introduction and aim

Intensity of the pituitary tumor in T2-weighted has been reported as a prognostic marker for tumor's aggressiveness and poor response to 1st generation somatostatin analogs.
The aim of this study was to **quantitatively assess the tumor intensity of somatotroph pituitary tumors in T2-weighted MRI scans and investigate its clinical implications**.

Material and methods

72 consecutive patients with acromegaly between 01.01.2012 and 31.12.2021 at the Department of Endocrinology, Jagiellonian University Medical College were evaluated- enrollment process was depicted in Fig. 1.

Figure 1.



58 patients were found eligible for the study. Signal intensity of the solid part of the PitNET and grey matter of the temporal lobe were measured on T2-weighted pituitary MR images. Patients were divided into 3 groups based on their intensity (table 1). IGF-1 to IGF-1 upper limit of the normal range for age and sex (IGF%ULN), tumor volume measured by manual delination of Volume of Interest, as well as age upon diagnosis were compared between the three groups. Subsequently, **Signal Intensity Ratio (SIR)** of the PitNET to grey matter was calculated.

Table 1.

hyperintensive	isointensive	hypointensive
• intensity higher than intensity of grey matter	• intensity higher than intensity of white matter, but lower than grey matter	• intensity lower than intensity of white matter

Results

SIR was correlated weakly with tumor volume (R=0.265, p=0.04). No association between SIR and age upon diagnosis and IGF%ULN were found. Association of TV measurement and SIR did not reach the statistical significance (p=0.055). **Median TV was 1.29 cm^3 (IQR 4.16) for hyperintense tumors, 1.46 cm3 (IQR 1.7) for isointensive tumors and 0.65 cm3 (IQR 0.56) for hypointensive tumors. Post-hoc analysis showed, that the statistically significant difference was between hyperintensive and hypointensive tumors and between isointensive and hyperintensive tumors.** No statistically significant differences were found between the isointensive tumors and hyperintensive tumors.

Conclusion

Both hyperintensive and isointensive tumors were larger than hypointensive tumors in our cohort. SIR was positively correlated with tumor size. **Whether not only hyperintensive, but also isointensive tumors tend to have a more aggressive course of disease requires further investigation.**