

Cod: PO079

CARDIAC MIBG SCINTIGRAPHY IN DIFFERENTIATION OF PARKINSON'S DISEASE AND ATYPICAL PARKINSONISMS: OUR EXPERIENCE

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BACKGROUND-AIM

[¹²³I]Metaiodobenzylguanidine ([¹²³I]MIBG) cardiac scintigraphy is useful to differentiate Parkinson's disease (PD) from atypical parkinsonisms, demonstrating a myocardial postganglionic sympathetic dysfunction only in PD. The evaluation of the heart/mediastinum uptake (H/M) ratio is a semiquantitative approach that could help to discriminate the two different groups of diseases but the cut-off values proposed in literature vary widely. The aim of our study was to evaluate the accuracy of MIBG scintigraphy and to determine the best H/M ratio cut-off values in our centre.

METHODS

We retrospectively evaluated 85 patients who underwent MIBG scintigraphy in our centre (December 2010 - July 2014, 48 males, 37 women, median age 65 years) to assess the concordance between the final clinical diagnosis and the scintigraphy results.

The scintigraphy included two planar scans at 10-15 minutes and 4 hours after tracer injection. H/M ratio were obtained from ROIs drawn manually over both images.

The last diagnosis was made by expert neurologists, supported by clinical and anamnestic criteria independently from the results of the MIBG scintigraphy.

RESULTS

At the clinical final evaluation (follow-up: 4-47 months; median 19 months) 47 patients satisfied clinical criteria for PD; the other 38 received a diagnosis of atypical parkinsonisms.

The H/M ratio was significantly lower in patients with PD than in those with parkinsonisms ($p < 0.001$) both in the early scan (PD: 1.3 ± 0.2 ; parkinsonisms: 1.6 ± 0.2) and in the late scan (PD: 1.2 ± 0.2 ; parkinsonism: 1.7 ± 0.2).

There were no significant differences between patients with/without disautonomic symptoms.

Well-known interfering factors (i.e.: drugs, diabetes mellitus) did not significantly modify the scintigraphy results.

Considering the H/M ratio 4 hours after tracer injection (H/M4h), 1.45 and 1.50 were the cut-off values that provided the higher values of accuracy (94%), sensitivity (94% and 96% respectively) and specificity (95% and 92% respectively) in differentiating PD from atypical parkinsonisms. A cut-off value of H/M ratio in the early scan (H/M10m) of 1.50 provided an accuracy of 89% (sensitivity 94% and specificity 84%).

CONCLUSION

Our study confirms the high diagnostic accuracy of MIBG myocardial scintigraphy in differentiate PD from atypical parkinsonisms. The higher values of diagnostic accuracy were obtained with H/M4h cut-off=1.45-1.50, one of the lowest values reported in literature. Our data suggest that a relatively low cut-off could be useful in improving the accuracy –in particular specificity- of myocardial MIBG scintigraphy. The early scan also showed high levels of diagnostic accuracy, even if lower than the late scan. Moreover our study suggests that interfering factor should be taken into account but do not hinder the execution of the scan.