Validation of a New Reference Values’ Database for Semiquantification of 123I-FP-CIT SPECT scans in one Nuclear Medicine Department

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Introduction

The DatScan™ and its Semiquantification (SQ) can provide advantages in the diagnosis of Parkinsonian syndromes (PS). To improve the SQ is recommended the creation of adapted database (DB) with reference values for the Nuclear Medicine Departments.\textsuperscript{1,2,3} Previously to this work was created a adapted database (DBRV) to Nuclear Medicine Department’s protocol and population of Infanta Cristina’s Hospital located in Badajoz, for patients between the ages of 60 and 75, and reference values of the SQ were calculated (Table 1).

**Aim:** To evaluate the discrimination capacity of a department’s adapted DB reference’s values of healthy controls for DatScan™.

Results

The Figures 2-9 represents the ROCC of the Binding Ratios (BR) A-H, used for validation of DBRV. By the ROCC assessment for each BR the values of Area Under the Curve (AUC) were obtained: A (AUC=0.81), B (AUC=0.79), C (AUC=0.91), D (AUC=0.93), E (AUC=0.88), F (AUC=0.86), G (AUC=0.87), H (AUC=0.87).

Subjects & Methods

It was used a semiautomatic method for segmentation and posterior calculi of binding potential in dopamine transporters (DAT) in striatum structures and in a nonspecific binding region (Figure 1). All exams were acquired by EANM’s Guidelines protocol and processed 3 times for one operator and average values were used\textsuperscript{1}. For validation purpose of reference values two different DB with 30 patients each, were considered: DB of healthy controls (DBVGIH) and DB of subjects with PS (DBVGIIH), both were processed using the same protocol and its results were compared with the ones of DBRV. Receiver Operating Characteristic Curves (ROCC) were calculated.

Discussion/Conclusion

The BR C and D measures the uptake from putamen, the first and main structure to degenerate in subjects with PS, so the AUC values (0.91 and 0.93) are excellent measures to distinguish between healthy patients and affected ones. The BR A and B have the lower AUC values (0.81 and 0.89) because they measures the uptake from caudate nucleus which is the last structure to degenerate in patients with PS. The remaining AUC values (0.88, 0.86, 0.87 and 0.87) of BR E, F, G and H are good discriminatory measures.\textsuperscript{2-4,7}

It’s possible to conclude that the DBRV and its reference values newly created have good discriminative capability between healthy controls and subjects with PS. The new DB is an adapted and improved tool for clinical use and assessment.

References