The clinical implications of using $^{123}$I-mIBG and the predictive role in Clinically Unclear Parkinsonian Syndromes (CUPS): a naturalistic Follow up study

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OBJECTIVE:
- To evaluate the clinical usefulness of $^{123}$I-mIBG ($^{123}$I-meta-Iodobenzylguanidine) scintigraphy in the differential diagnosis of idiopathic Parkinson disease (IPD) versus CUPS.

BACKGROUND:
- Visualisation of the heart using $^{123}$I-mIBG scintigraphy is an useful method to differentiate Parkinsonism from IPD.
- The role of $^{123}$I-mIBG in CUPS has not been evaluated in a longitudinal Follow Up (FU) study.
- Accepted indication for referral in some countries such as Japan but not in the UK.

METHODS: In this retrospective audit
- 37 cases of CUPS (mean age 73.2 ± 9.9 years, 59.5% male, mean disease duration 8.5 ± 4.2 years) were identified who have had $^{123}$I-mIBG between 2006-2013.
- All have been given a provisional baseline diagnosis following the $^{123}$I-mIBG scan results graded as below:

| Type 1 | Non visualisation of the heart |
| Type 2 | Borderline visualisation of the heart |
| Type 3 | Clear visualisation of the heart |

- All 37 were evaluated for accuracy of baseline clinical diagnosis (based on $^{123}$I-mIBG/MIBI scan) at a variable FU period.
- Inter-observer agreement of imaging analysis was studied.
- All patients underwent additional MIBI Scans until 2012. Subsequently MIBI was only done in cases of Non visualisation of the heart.

RESULTS:
- 77.8% of CUPS cases with the clinical diagnosis of IPD at FU had confirmed Type 1 $^{123}$I-mIBG scans.
- The diagnosis of atypical Parkinsonian Syndrome at FU correlated with 42.9% of cases with Type 3 $^{123}$I-mIBG scans.
- 42.9% of cases who continued a diagnosis of CUPS had Type 3 scans (Table 1).

METHOD: Cardiac $^{123}$I-mIBG Imaging
- Blocking of thyroid uptake with 85 mg potassium Iodate one day before and on the day of scan, unless patient has had total thyroidectomy or is on thyroxine maintenance.
- I.v. injection of 185 MBq (EDE: 2.8 mSv) $^{123}$I-mIBG slowly over several minutes.
- Gamma camera imaging (Phillips Skylight, t=600s, 256x256, VXGP collimator) at 15 minutes and 3 hours post injection with supine positioned patient.

REFERENCES:

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CONCLUSIONS:
- Type 3 $^{123}$I-mIBG scans appear to have a higher index for clinical diagnosis of Atypical Parkinsonian syndromes or cases that continue to be assigned as CUPS rather than IPD.
- Type 1 $^{123}$I-mIBG scans are on the other hand more indicative of cases finally diagnosed as IPD.
- Cardiac $^{123}$I-mIBG scan (supported by Cardiac MIBI scan where relevant) can play an useful role in the differential diagnosis of Atypical Parkinsonian and CUPS cases.