DYNAMIC PITUITARY MRI HAS HIGH POSITIVE AND NEGATIVE PREDICATIVE VALUE FOR THE DIAGNOSIS OF MILD CUSHING’S SYNDROME AND SHOULD BE PART OF THE INITIAL WORKUP

C. Gastelum, E. Zuckerbraun, M. L. Lee, M. S. Kabil, H. K. Shahinian and T. C. Friedman. Division of Endocrinology, Metabolism, and Molecular Medicine, Charles Drew University of Medicine and Science and Skull Base Institute, Los Angeles, CA.

Objective The diagnosis of mild or episodic Cushing’s syndrome is difficult. The standard tests include 24 hr urinary free cortisol (UFC), night-time blood or salivary cortisol measurements and dexamethasone suppression tests. Imaging studies of the pituitary have not been recommended as part of the initial workup (only to help distinguish pituitary Cushing’s disease from the ectopic ACTH syndrome) because of poor sensitivity and specificity. With the development of dynamic pituitary MRI which uses multiple coronal dynamic sequences following gadolinium intravenous contrast, we hypothesized that the sensitivity and specificity would be increased and MRI would provide useful information for the initial diagnosis of Cushing’s syndrome.

Methods 24 h UFC and urinary 17OHS, 11 PM salivary cortisol measurements, evening plasma cortisol and dynamic pituitary MRI were performed in on 87 consecutive patients with signs and symptoms of hypercortisolism. Most patients had mild and/or episodic hypercortisolism. Of these patients, 24 eventually were diagnosed with pituitary Cushing’s syndrome by biochemical testing and 22 had the diagnosis of Cushing’s syndrome excluded. The reader of the MRI (1.5 Tesla) was blind to the diagnosis.

Results 23 of 24 patients had had a MRI consistent with a pituitary lesion (21 with a microadenoma, two with pituitary asymmetry. In contrast, only 3 of 19 patients (3 patient did not have MRIs) in the Cushing’s excluded group had a pituitary lesion on dynamic MRI. The positive predictive value for the diagnosis of Cushing’s syndrome was 0.88, 0.82, 0.83, 0.68, 0.75 and 0.89 for 2300 h salivary cortisol, UFC, 17OHS, 17OHS/Cr, night-time plasma cortisol and MRI. The negative predictive value was 0.70. 0.64, 0.78, 0.74, 0.56 and 0.94.

Conclusion We conclude that almost all patients in this series with Cushing’s syndrome have a lesion on dynamic pituitary MRI, a rate much higher than the 50-60% rate reported for non-dynamic MRIs. The false positive rate of 16% in our group of pseudoCushing’s patients is similar to the literature value of 10% seen in normal volunteers and is acceptable since MRI is not used solely as a determinant for the diagnosis. While a negative MRI will miss those patients with adrenal or ectopic Cushing’s syndrome, those patients can usually be diagnosed by other testing. Thus, dynamic pituitary MRI adds valuable information to assist in the diagnosis of Cushing’s syndrome and should be ordered as part of the initial workup.