

Walia R et al. Molecular Imaging Targeting Corticotropin Releasing Hormone Receptor for Corticotropinoma: A Changing Paradigm. J Clin Endocrinol Metab. 2020 Oct 20:dga755. doi: 10.1210/clinem/dga755. Online ahead of print.

BACKGROUND: Corticotrophin releasing hormone (CRH) is the major regulator of ACTH secretion from the anterior pituitary and acts via CRH-1 receptors (CRH-1R). Corticotropinoma though autonomous still retain their responsiveness to CRH and hence, we hypothesize that in vivo detection of CRH-1 receptors on pituitary adenoma using Gallium-68 (⁶⁸Ga) tagged CRH can indicate the functionality of adenoma and combining it with Positron emission tomography-computed tomography (PET-CT) can provide requisite anatomical information.

METHODS: Subjects with ACTH dependent Cushing's syndrome (CS) [n = 27, 24: Cushing's disease (CD), 3: ectopic Cushing's syndrome (ECS)] underwent ⁶⁸Ga CRH PET-CT. Two nuclear medicine physicians read these images for adenoma delineation and superimposed them on MRI sella. The information so provided was used for intra-operative navigation and compared with operative and histopathological findings.

FINDINGS: ⁶⁸Ga CRH PET-CT correctly delineated corticotropinoma in all the 24 cases of CD, including the ten cases with size < 6mm (four cases negative on MRI). Corticotropinoma location on ⁶⁸Ga CRH PET fusion images with MRI were concordant with operative findings and further confirmed on histopathology. There was no tracer uptake in pituitary in two patients with ECS while in another, the diffuse uptake in pituitary suggested ectopic CRH production.

CONCLUSION: ⁶⁸Ga CRH PET-CT represents a novel non-invasive molecular imaging targeting CRH receptors that not only delineates corticotropinoma and provides surgeon with valuable information for intra-operative tumour navigation but also helps in differentiating pituitary from extra-pituitary source of ACTH dependent Cushing's syndrome.