SAT-172

FDG PET/CT in Benign vs. Malignant Adrenocortical Tumors

^{18}F-fluorodeoxyglucose positron emission tomography computed tomography (FDG PET/CT) is frequently used for evaluation of indeterminate adrenal nodules.

The objective of this study was to evaluate the diagnostic performance of FDG PET/CT in distinguishing benign adrenocortical adenomas (ACA) from adrenocortical carcinoma (ACC).

We identified 139 patients in our institution who completed both FDG PET/CT and adrenal biopsy or adrenalectomy from 2001 to 2019 using the institutional Electronic Medical Record Search Engine (EMERSE). Patients with adrenal pathology revealing non-adrenocortical tumors were excluded. The imaging characteristics of ACAs were compared with ACCs.

Sixteen patients with ACAs and 50 patients with ACC were identified; of the latter, 30 were excluded, because FDG PET/CT imaging was completed after adrenalectomy. The average age of the ACC vs. ACA group was 48±14 and 52±17 years, respectively, with a gender composition of 35% and 25% men, respectively. All 20 patients with ACC had FDG avid lesions, defined by imaging report and increased ratio of adrenal tumor maximum standardized uptake value (SUVmax) to hepatic parenchymal average SUV (SUVmean) of greater than 2.5. Among those with ACAs, 11 had positive, 1 had mildly positive, 3 had indeterminate, and 1 had negative FDG PET/CT findings according to the report. Ratio of adrenal SUVmax to hepatic SUVmean was greater in ACC compared to ACA (13.5 versus 1.6, respectively, $p = 0.13$), but did not reach statistical significance, likely due to the small sample size and unavailability of SUV ratios for all lesions.

Our study identified a large number of ACAs that were deemed FDG avid but without adrenal SUVmax to hepatic SUVmean ratio of greater than 2.5. Although the sensitivity, and therefore the negative predictive value, of FDG PET/CT scan is excellent for the diagnosis of ACC, our data does not allow for the calculation of specificity. This is due to the selection bias inherent in our patient population referred for evaluation of unusual adrenal masses, and the fact that ACAs with negative FDG PET/CT often do not undergo surgery or biopsy, and therefore pathology results are not available. Despite this limitation, our findings show that calculation of the ratio of adrenal SUVmax to hepatic SUVmean,
rather than lesion SUVmax alone, helps for characterization of adrenal lesions as malignant vs. benign, and that a negative FDG PET/CT is valuable in excluding ACC.

Thyroid

THYROID NEOPLASIA AND CANCER

The 2015 American Thyroid Association Risk Stratification System Is a Predictor of Persistent Disease in Real-World Clinical Practice

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OR21-07

Background. Management and follow-up of differentiated thyroid cancer (DTC) are guided by the likelihood of disease persistence or recurrence. The American Thyroid Association (ATA) practice guidelines provide a risk-estimation system based on data mainly derived by retrospective, single-center, and small cohorts.

Aim. To validate the ATA risk-stratification system in predicting persistent structural disease.

Methods. We analyzed data from the Italian Thyroid Cancer Observatory's observational, web-based database, which prospectively enrolls newly diagnosed DTC patients in 40 Italian centers. For the present study we selected consecutive cases satisfying the inclusion criteria: 1) histological diagnosis of DTC, including papillary, follicular, and poorly differentiated tumors; 2) registration in the ITCO database between January 1, 2013 and April 23, 2019; 3) clinical evaluation between 6 and 18 month after primary treatment, including enough data to estimate the response to the initial treatment. Exclusion criteria were: histological diagnosis of NIFTP, medullary, or anaplastic thyroid cancer. The response to the initial treatment was categorized as excellent, biochemical incomplete, structural incomplete, or indeterminate based on imaging findings (neck ultrasound and other imaging studies, if performed), basal or stimulated serum thyroglobulin levels, and anti-Tg antibody levels. To model the response to treatment, we used a cumulative link model; given the hierarchical structure of the data, with patients nested within centers, we used a mixed-effect model, with a center-specific intercept summarizing unobserved center-specific characteristics.

Results. Complete data about initial treatment and response to treatment after 6-18 months since initial treatment was available for 2071 patients. According to the ATA system, 1109 patients (53.6%) were classified as low-risk, 796 (38.4%) as intermediate, and 166 (8.0%) as high-risk. Excellent response was recorded in 1576 (76.1%) patients, indeterminate in 376 (18.2%), biochemical incomplete in 33 (1.6%), and structural incomplete in 86 (4.2%).The ATA risk stratification system is a significant predictor of response to treatment after 6-18 months: classification as intermediate- and high-risk increased the likelihood of a response worse than excellent (OR 1.68 [95% confidence intervals, CI 1.34-2.10] and 3.23 [95% CI 2.23-4.67], respectively), and a persistent structural disease (OR 4.67 [95% CI 2.59-8.43] and 16.48 [95% CI 7.87-34.5], respectively. In both analyses, the effect of the center (taking into account center-specific features) was negligible and not statistically significant.

Conclusion. The 2015 ATA risk stratification system is a reliable predictor of short-term outcomes in patients with DTC, also if applied in a real-world setting consisting of several different clinical sites.