

413 IN VIVO EVALUATION BY IMMUNO-PET/CT OF THE IMPACT OF A PRELOAD WITH COLD ANTIBODIES ON THE DISTRIBUTION OF RADIOLABELED ANTIBODIES

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Introduction: Despite the common use of a preload with cold (unlabeled) monoclonal antibodies (mAbs) prior to radioimmunotherapy, little is known about the potential impact in vivo of high levels of circulating anti-CD20 mAbs on targeting of a second radiolabeled anti-CD20 mAb. This preload is assumed to clear the peripheral blood of B cells and to improve targeting of the radiolabeled antibody to the tumour cells. Immuno-PET/CT combines the high sensitivity and resolution of a PET camera with the specificity of a mAb. In this study, ⁸⁹Zr-rituximab immuno-PET was used for simulation of radioimmunotherapy with ⁹⁰Y-rituximab without preload and with the (standard) high preload (250mg/m²) of rituximab.

Material and Methods: In 5 patients with relapsed CD20+ B-cell lymphoma, ⁸⁹Zr-rituximab immuno-PET was performed at 3 time points starting within 1 hour and at 3 and 6 days post injection of 3 mCi ⁸⁹Zr-rituximab without preload and (with a 3-week time interval) with the (standard) high preload (250mg/m²) of rituximab. For each patient, the tracer distribution for organs and lesions was compared at the 3 different time points.

Results: The preload of mAbs lead to a decrease of the activity in the spleen ranging from 92% in a patient with preserved (9%) circulating CD20+ B-lymphocytes (CBL), compared to only a moderate decrease of 21% in a patient with complete B-cell depletion (0% of CBL), resulting in a significantly higher blood activity in patients with B-cell depletion without preload (10x) as well as after the preload (2-3x). In contrast, the decrease of uptake in bone marrow due to the preload was only moderate (<50%) in all patients, independent of the % of CBL. Lesion based analysis showed a significant higher uptake at enlarged lymph nodes in 4 out of 5 patients, as well as more (predominantly small) CD20+ lymph nodes in 3 out of 5 patients on the images performed without a preload of mAbs, suggesting a partial saturation of the CD20 antigens by the preload of cold mAbs. In contrast, 2 visceral (biopsy proven) lesions in the stomach and esophagus were only targeted when a preload was administered.

Conclusion: The impact of a preload of rituximab on the distribution of the radiolabeled Zr89-rituximab was highly variable in the 5 evaluated patients and depended predominantly on the % of CBL. The influence of other parameters, such as the amount of administered cold mAbs, the tumour load and the site or accessibility of the CD20-expression warrants further evaluation. Although preliminary, these results suggest that alternate, patient tailored, treatment strategies might improve the therapeutic efficacy of receptor targeted treatments with radioimmunotherapy or immunotoxins.

414 THE INITIAL RESULTS EARLY R-CHOP THERAPY ASSESSMENT USING FLT PET/CT IN PATIENTS WITH DLBCL TREATED WITH R-CHOP

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FDG PET/CT is a valuable tool for the treatment response assessment in patients with lymphoma. DLBCL treated with R-CHOP is a group with acceptable NPV and low, unsatisfactory PPV in early treatment assessment using FDG PET/CT. This is probably because of an inflammatory reaction caused by rituximab. FLT, a tracer with a deprived metabolism in the inflammatory lesion, could be the choice in this situation. The aim of the study is to assess the usefulness of FLT PET/CT in the early (after one course of R-CHOP) therapy assessment.

Subjects: from July to December, 2010, 9 patients, age 54 ± 9 with DLBCL stage I – IV referred to our clinic for diagnostics and treatment of DLBCL. This group of patients is treated with R-CHOP.

Methods: FLT PET/CT studies were made using the Siemens Biograph mCT and Biograph 16 scanners, 60 min after 350 MBq FLT injection as initial staging and repeated 7- 13 days after the first course of R-CHOP. We compared the results of initial staging and the results after one cycle. As a negative we recognized patients with a lack of FLT metabolism in the lymph nodes positive according to the initial FLT PET/CT. We compared lesion to lesion in both studies in particular patients. We plan

to perform FLT PET/CT at the end of treatment and follow up with the patients for two years. We plan to enroll 35 patients as a final number of the group.

Results: In the initial staging, all nine patients were positive according to the FLT PET/CT. SUV value was between 27,2 and 1,3 mean 7,77. We found 46 lesion with high FLT metabolism. In the interim FLT PET/CT eight patients were negative, one patient was assessed as positive. In this particular patient from 15 positive lymph nodes two were left. The decrease in the FLT metabolism was from 19,5 and 15,8 to 3,4 and 6,1 SUV respectively. All patients are continuing therapy without serious complications.

Conclusion: Initially high FLT metabolism in the positive lymph nodes was negative after one course of R-CHOP therapy in eight out of nine patients. These results may confirm the theory that the FLT will be the tracer able to early assess the R-CHOP treatment efficacy without false positive results present during FDG PET/CT.

415 THE INITIAL RESULTS OF FACE TO FACE COMPARISON BETWEEN FLT AND FDG PET/CT IN THE ASSESSMENT OF INITIAL STAGING OF PATIENTS SUFFERED FROM DLBCL

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PET/CT is a valuable tool in the assessment of initial staging in patients with lymphoma. DLBCL is a group of lymphoma with high FDG metabolism and from this point of view there is no necessity to change the diagnostic paradigm. Although, according to literature, the results of early response treatment assessment using this tracer are unsatisfactory because of false positive results. FLT, a tracer with generally deprived metabolism in the inflammatory lesion, could be the choice in this situation. The aim of the study is to compare results of FLT and FDG PET/CT for initial staging. **Subjects:** 9 patients, age 54 ± 9 with DLBCL stage I – IV referred to our clinic for diagnostics and treatment DLBCL.

Methods: FET and FDG PET/CT studies were made by using the Siemens Biograph mCT and Biograph 16 scanners, 60 min after 350 MBq FLT and 7 MBq/kg FDG injection. The time span between these two studies was 7±2 days. We compared the initial stage of the patients according to the FDG and FLT PET/CT and compared lesion to lesion in both studies in particular patients.

Results: In all nine patients FDG and FLT gave the same results in the patients' staging assessment. We found 52 lesions in FDG and 46 in the FLT PET/CT. The differences were in the assessment of Waldeyer ring- 5 cases, lung -1 patient, and breast -2 patients where FLT did not show the pathological metabolism. The SUV in FDG PET was between 36,0 mean 15,14 and SUV in FLT PET was between 27,2 and 1,3 mean 7,77.

Conclusion: Our initial results show: FDG and FLT give the same results in the assessment of initial staging of DLBCL patients. Overall and lesion to lesion, FLT metabolism of the lesions is lower than FDG but does not compromise the final results of staging. In a direct comparison, FLT probably would be able to exclude inflammatory lesion questionable in the FDG studies.

416 WITHDRAWN

417 POSITRON EMISSION TOMOGRAPHY FOR MANTLE CELL LYMPHOMA MANAGEMENT

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Introduction: Current data on fluorodeoxyglucose positron emission tomography (PET) in mantle cell lymphoma (MCL) are scant, despite the histotype is considered FDG avid. We retrospectively analysed 94 PET scans in 49 MCL patients (pts) and compared the results with standard contrast-enhanced computerized tomography (CT).

Methods: Forty-nine pts with biopsy proven diagnosis of MCL (4 blastoid variant) underwent PET for a total of 94 scans. PET scans were compared with CT performed within 4 weeks. Forty-seven PET were performed for disease staging at diagnosis or relapse and 47 for response assessment.

Results: PET and CT results were concordant in 40/94 cases (42.5%). Discrepancies were found in 54/94 cases (57.5%) and were grouped in: false negative baseline PET (5 cases, 5.3%), positive PET with disease extension minor (20 cases, 21.3%) or major (18 cases, 19.1%) than CT, restaging positive PET with negative CT (6 cases, 6.4%) and restaging negative PET with positive CT (5 cases, 5.3%). Baseline involvement of gastro-intestinal tract was detected by PET in 10/47 cases (21.3%), all with positive endoscopy. In 24 cases bone marrow biopsy proved lymphoma involvement, while skeleton uptake was detected by PET in 4 cases. PET sensitivity and specificity were 93.4% and 90%; positive predictive value was 97.2% and negative predictive value was 78%. No statistical significant correlation was found between PET sensitivity and proliferation index, but no pts with Mib-1 > 50% presented either false negative or downstaging PET.

Conclusion: This analysis shows a low rate of concordance (42.5%) between CT and PET in MCL. A false negative baseline PET was registered in 10.6% of pts. PET downstaging or upstaging of disease burden is frequent but seldom results in different therapeutic approach. Minimal residual disease, detected by PET at restaging in 6/19 standard CT negative pts, has uncertain role in MCL. PET is likely to be more reliable in MCL pts presenting high proliferation index and should be limited to clinical trials.

	Diagnosis or relapse	Response assessment	Total
Concordance	16	24	40 (42.5%)
CT+ and PET+	16	11	27
CT- and PET-	0	13	13
Discrepancy	31	23	54 (57.5%)
CT+ and PET-	5	5	10
PET+ > CT+	12	6	18
PET+ < CT+	14	6	20
CT- and PET+	0	6	6
Total	47 (50%)	47 (50%)	94

418 EVALUATION OF INTERIM ¹⁸F-DG-PET IN ADVANCED HODGKIN LYMPHOMA (HL) PATIENTS (PTS) TREATED WITH CHLVPP/ABVVP REGIMEN

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Background: Negative ¹⁸F-DG-PET after 2 cycles of ABVD chemotherapy (early ¹⁸F-DG-PET) has been associated with better prognosis in advanced HL pts. Few data are available with more intensified regimens. We evaluated the prognostic value of interim ¹⁸F-DG-PET in advanced HL pts treated with intensified ChLVPP/ABVVP.

Methods: 70 consecutive pts received 6 cycles of our hybrid chemotherapy regimen (D1 Vinblastine 6 mg/sm; D1-7 Procarbazine 80 mg/sm/d, Chlorambucil 6 mg/sm/d, Prednisolone 50 mg/d; D8 Doxorubicin 30 mg/sm, Vincristine 1 mg, Bleomycin 7.5 IU/sm; D8-10 VP16 100 mg/sm/d; D11 Pegfilgrastim 6 mg; every three weeks) for stage II- IV HL. Median age was 32 yrs (range: 16-68), with classic HL in 69 pts and lymphocyte predominant in 1. All pts were staged and reevaluated according to Cheson criteria. Furthermore, ¹⁸F-DG-PET scan was performed after third cycle and considered positive if SUVmax lesions > SUVmax blood.

Results: After six cycles of ChLVPP/ABVVP, 65/70 pts were considered in complete remission, 4/70 in partial remission and one in progressive disease. Interim ¹⁸F-DG-PET was positive in 11 cases (16%), with six pts in long lasting complete remission. The positive predictive value was 45%. Interim ¹⁸F-DG-PET was negative in 59 cases, with six relapses and one progressive disease. The negative predictive value was 88%.

With a median follow-up of 35 months from diagnosis, 5 years freedom from treatment failure (FFTF) and overall survival (OS) were 80 and 96%. 5 years FFTF and OS according to interim PET status were 54-85% (P-value: <0.01) and 88-97% (P-value: 0.22) for positive and negative pts, respectively.

Conclusions: Although FFTF is statistically better for pts with interim negative PET, considering sensibility and specificity, its role in predicting outcome of this intensified hybrid regimen seems to be weaker than that observed with ABVD.