5th INTERNATIONAL WORKSHOP ON INTERIM-PET IN LYMPHOMA

Poster Discussion - technical abstracts

Menton (France), Palais de l’Europe, September 18-20, 2014
issues addressed

- importance of central review panel
- application of D 5PS to the end therapy PET in FL
- variability of liver uptake btw baseline & int PET
- int-PET as a biomarker of response in NHL
- hematologist's perspective on PET reporting and ceCT
- variations of PET operations

- FLT and FDG PET for early therapy evaluation
- 89Zr-rituximab and 89Zr-ofatumumab in DLBCL

- evaluation of int-PET using quantitative PET parameters
- dual-time PET in suspected malignant lymphoma
- clinical trial qualification of PET scanners & cross-calibration for SUV analysis
**Aim:** To evaluate whether a PET and MRD response-based maintenance therapy is more effective as measured by PFS than a std maintenance therapy with Rituximab in pts with untreated, advanced FL

33 ctrs, retrospective, PET0, PET4 (not mandatory), end therapy PET, (END-PET), R-CHOP-21

Therapy modified based on MRD and End-PET

Five expert reviewers, 5PS, scores 4-5 positive
**FOLL 12 - TRIAL**: randomized, multicenter, phase III, response-adapted trial to define maintenance after std rx in advanced FL

**Standard arm**
- CR, PR → R Maintenance every 2 months x 2yrs
- <PR → Salvage

**Experimental arm**
- Patients with no molecular markers
  - PET- → Observation
  - PET+ → (90) Y Ibritumomab Tiuxetan + R Maintenance every 2 months x 2yrs
- MRD
  - Pos → Rituximab weekly x 4
  - Neg → Observation

**INDUCTION therapy**
Results

- All scanners had Clinical Trial Qualification by the Core Lab in Cuneo.
- After training (20 cases), agreement among the reviewers increased agreement among readers fair.

<table>
<thead>
<tr>
<th>Centers</th>
<th>Pts enrolled</th>
<th>End-PET Reviewed</th>
<th>Positive PET</th>
<th>Reviewers</th>
<th>Concordance $\alpha$</th>
<th>Concordance $\kappa$</th>
</tr>
</thead>
<tbody>
<tr>
<td>33</td>
<td>108</td>
<td>51</td>
<td>6 (12%)</td>
<td>5</td>
<td>0.66</td>
<td>0.44-0.89</td>
</tr>
</tbody>
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Conclusions: There is a good concordance among central reviewers using the 5PS confirming that it is a reliable tool for End-PET reporting in advanced stage FL. However, a period of training is essential.
Aim: to evaluate the intrapatient variability of FDG liver uptake after 2 courses of chemo in DLBCL or HL pts

775 pts from randomized phase III studies, prospective, PET0, PET2:

- 162 DLBCL from GAINED 81 R-ACVBP and 81 R-CHOP
- 514 HL from the std arm of AHL 2011, escBEACOPP
- 99 early stages HL from H10, ABVD

Liver SUVmax calculated as the mean of 2 independent measures from a VOI centered in the right lobe of the liver.
Results

- Fixed PET acq protocol: Data available in 676 pts: no significant difference in inj-acq interval, inj dose and glucose level btw PET0 and PET2
- Interim liver SUVmax was higher than that of the baseline
- No difference btw early and advanced stage pts

<table>
<thead>
<tr>
<th></th>
<th>Mean SUVmax 0</th>
<th>Mean SUVmax 2</th>
<th>Mean Δ SUVmax / %</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHOP</td>
<td>2.94 (CI=2.78-3.10)</td>
<td>3.16 (CI=3.02-3.31)</td>
<td>0.22 / +7.5%</td>
</tr>
<tr>
<td>ACVBP</td>
<td>3.12 (CI=2.96-3.28)</td>
<td>3.34 (CI=3.20-3.47)</td>
<td>0.21 / +7%</td>
</tr>
<tr>
<td>BEACOPP</td>
<td>2.70 (CI=2.64-2.76)</td>
<td>2.93 (CI=2.87-2.99)</td>
<td>0.23 / +8%</td>
</tr>
<tr>
<td>ABVD</td>
<td>2.35 (C=2.24-2.46)</td>
<td>2.53 (CI=2.42-2.64)</td>
<td>0.18 / +7.6%</td>
</tr>
</tbody>
</table>
Conclusions: Regardless of chemo, liver SUVmax increases after the 2 cycles of chemo for all pts,  

- suggesting a variation in the hepatic metabolism or liver glucose consumption

- The impact of the liver SUVmax fluctuation during treatment on the visual analysis of int PET is probably minor; it increased the specificity of DS 4

- the eye is sensitive to differences in contrast; PET-CT images should be scaled to a fixed SUV display and color table
**Aim:** to validate FDG-PET as a biomarker of response in first-line NHL therapy using meta-analysis of individual pt data (IPD) and to determine its cost-effectiveness

**Rationale:** There is a need for an integral approach using results of various studies. It is unclear to which extent conflicts in NHL are due to:
- timing differences during therapy,
- PET reading criteria,
- different therapies and/or different subtypes of lymphoma.

**Objectives**
- build a database of clinical studies on int-PET in NHL
- determine optimal timing of int-PET during first-line therapy
- determine which response criteria better predict response and PFS
- assess therapy effects on performance of int-PET
- assess NHL subtype effects on performance of int-PET
PETRA database will be a shared database of IPD of int FDG-PET studies

comprehensive int-PET data meta-analysis, including metabolic volume, heterogeneity and CT parameters

Only after these issues are solved, this technique can be implemented in daily clinical practice

**Aim:** investigate the variation in reporting PET and ceCT in lymphoma and the hematologists’ expectations regarding format, content, quality.

A nationwide web-based survey, on the actual reporting, preferences and need for guidelines on reporting

**Results:** 38% responded; 26% teaching hospitals, 74% non-teaching hospitals with or without PET/CT

- combined report of PET and CT in 48% and desired in 84%
- In 46%, format is divided into body parts, 21% into disease localisations
- Preference for body part is 47% and per disease localisation 36%
- 5PS used in 49% and desired in 62%
- All hospitals use visual criteria and 29% request SUV-based assessment
• Ann Arbor classification mentioned in 29% and desired in 42%

• In 67%, the multi-disciplinary meeting found important on the interpretation

• **Conclusions:** considerable variations in methods of reporting of PET/ceCT. There is a need for standardisation of reporting to optimize PET/ceCT in patients with malignant lymphoma.

~62% prefer revised Cheson criteria for CT measurements

Is there a need for a clear standardization of reporting

The need for standardisation of reporting is expressed by 69%
Aim: To investigate the variation in performing and reporting of PET and contrast enhanced CT (CECT) in malignant lymphoma

A nationwide web-based survey among nuclear medicine physicians, on the acquisition of PET and CECT, method of reporting PET/CECT and the criteria used for response assessment

36% responded; 29% academic hospitals, 71% non-teaching

- 59% combine the acquisition of PET and CECT
- A combined report of PET and CECT is performed by 38%,
- in 39% a separate report of the CECT is reported
• 23% use 5PS, 16% use IHP criteria, 11% use SUV and 34% use different criteria depending on timing of PET in treatment schedule

• LN measurements done by rIWG in 34%, RECIST in 11% and in 38% variable

• Ann Arbor classification mentioned in 34%

• 61% report the impact of tm-board meetings on their interpretation

• The need for standardisation of reporting is expressed by 61%

**Conclusions:** considerable variation in PET/CECT operations/reporting. These results underline the need for standardisation for uniform operations and reporting of PET/CECT
PET SCANNER CLINICAL TRIAL QUALIFICATION FOR WORLDWIDE ONCO-HAEMATOLOGICAL STUDIES

68GE-PHANTOM CROSS-CALIBRATION OF PET SCANNERS FOR SUV QUANTITATIVE ANALYSIS

Chauvie S1, Biggi A1, Versari A2, Guerra L3, Ceriani L4, Coronado M5, Luminari S6, Federico M6, Zucca E4, Martelli M7, Caballero M8, A Gallamini
C 2 - Assessment of different thresholds for calculating the total metabolic volume (TMTV) in FDG PET to predict survival in Hodgkin lymphoma.

S Kanoun, I Tal, A Berriolo-Reidinger, C Rossi, J-M Reidinger, J-M Vrigneaux, L legrand, O Casasnovas, F Brunotte, A Cochet
C 5 – Beth Israel plugin : A new free software tool for metabolic tumor volume calculation on PET/CT

Salim Kanoun, Ilan Tal, Alina Berriolo-Reidinger, Cedric Rossi, Jean-Marc Reidinger, Jean-Marc Vrigneaux, Louis Legrand, Olivier Casasnovas, Francois Brunotte and Anlexandre Cochet combined with C2
D2 DUAL TIME POINT 18F-FDG PET/CT IN THE EVALUATION OF PATIENTS WITH SUSPECTED MALIGNANT LYMPHOMA

Karen Juul Mylam, Anne Lerberg Nielsen, Poul-Flemming Høilund-Carlsen, Abass Alavi, Oke Gerke, Poul Erik Braad, Anne Birgitte Mehlsen, Morten Damgaard, Lars M Pedersen, Martin Hutchings