FDG PET/CT in pediatric lymphoma

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General considerations on FDG PET/CT in paediatric lymphoma

- Frequency of brown fat activation (prevention by unselective oral beta blockers recommended in the EuroNet trial)

- Frequency of physiologic uptake of thymus, pitfall: accessory gland
General considerations on FDG PET/CT in paediatric lymphoma

- Difficulty to schedule FDG PET for staging in NHL, due to the aggressiveness of disease and emergency of therapy
Hodgkin lymphoma: tumour characteristics and FDG uptake

• FDG avidity in 97-100% of cases in children and adults

• FDG uptake is lower in lymphocyte-predominant HL (10% in children) than in classic HL
  (Hutchings et al. Hematol Oncol. 2006)
  However, FDG PET is accurate
  (Ansquer et al, Haematologica 2008,
In children with aggressive HL, requiring high dose corticosteroid therapy before chemotherapy, the baseline PET may be partly negativated after corticosteroids alone.
FDG PET/CT in staging childhood HL


- Higher sensitivity of FDG PET vs bone marrow biopsy in children (Purz et al, J Clin Oncol, 2011) (In future EuroNet-PHL study, routine bone marrow biopsies will be replaced by FDG PET)
Because in HL, some lesions can be non-FDG-avid. It is then very important to evaluate the volume reduction, which can be inadequate although the metabolic response is adequate.
Importance to correlate FDG PET with other imaging modalities

FDG uptake in the sacrum in a 14 year-old girl with HL staged II before PET
No abnormality on the corresponding CT
Importance to correlate FDG PET with another imaging modality

Confirmation of the sacral bone marrow involvement by MRI

=> Stage IV
Role of FDG PET in assessing therapy response in pediatric HL

crucial point which will be addressed in the next talk
FDG PET/CT and NHL in children

Pediatric Non-Hodgkin lymphoma comprises a broad heterogeneity of mostly aggressive high-grade lymphomas.

For example, Burkitt lymphoma is the fastest growing human tumour and doubles within 12-48 h

FDG PET/CT and NHL in children

Ongoing study in France on the role of FDG PET in staging and response assessment of pediatric NHL in comparison to conventional methods.

Some questions are:

- Are all the histologic subtypes FDG avid?
- What is the performance of PET to detect extranodal disease, especially in kidneys and bone marrow?
- Is an effective assessment of response possible in absence of initial PET?
- Is FDG PET useful?
The intensity of uptake is most often very high

Burkitt lymphoma
The intensity of uptake is most often very high

Large B-cell lymphoma  Primary mediastinal B-cell lymphoma  Anaplastic large-cell lymphoma
Lymphoblastic T lymphoma

The intensity of uptake is usually very high … but not always
Burkitt lymphoma revealed by two episodes of intestinal invagination in a 10 year old child.

PET performed one week after surgery. Abdominal wall uptake and lymph node uptakes probably post operative but inconclusive.
Conclusion

Important differences in histology, disease manifestation and treatment in HL and NHL in childhood

Today, FDG PET is recognised as an accurate imaging modality and is used for tailoring treatment intensity in children with HL

The role of FDG PET in NHL in children is not yet established and it will be the objective of the ongoing protocol in France to define it.