Results
Overall, proton plans achieved lower dose for most of the OARs. Consequently, the NTCPs were significantly lower, $p < 0.05$. However, the variation, due to the model and radiobiological parameters choice, showed a significant impact on UTCP based on TCP/NTCP regarding medical decision. Similarly the variation of TCP/NTCP can reach 20-30% and 100% for secondary cancer, depending on the model.
Conclusion
The considerable impact of radiobiological model on the radiotherapy outcomes urges us, once again, to measure specific (CTCAE scale) and global (QoL as EQ-5D) clinical outcomes, to tune the parameters of TCP/NTCP radiobiological models. On the other hand, a consensus on radiobiological parameters to compare and rank plans is highly advised in order to initiate real clinical trial instead of solely in-silico comparisons.

EP-1381 Treatment outcomes of proton craniospinal irradiation for paediatric medulloblastoma
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Purpose or Objective
Craniospinal Irradiation (CSI) is the standard radiation therapy treatment for medulloblastoma. Conventional CSI photon therapy (Photon-CSI) delivers significant dose to surrounding normal tissues. Research into paediatric CSI with proton therapy (Proton-CSI) has increased, with the aim of exploiting the potential to reduce normal tissue dose and associated post-treatment complications. This review aims to compare treatment outcomes of paediatric medulloblastoma patients between Proton- and Photon-CSI treatments.
Material and Methods
A search and review of studies published between 1990-2015 comparing paediatric (2-18yrs) medulloblastoma Proton- and Photon-CSI in three aspects – normal organ sparing and target coverage, normal organ dysfunction and second malignancy risks – was completed.
Results
Fifteen studies were selected for review and the results were directly compared. Proton-CSI reported inconsistent target coverage improvements and improved out-of- field organ sparing was subjected to target volume definition and patient's size. Normal organ dysfunction risks were predicted to be lower following increased normal tissue sparing with Proton-CSI. However, dysfunction can arise from indirect irradiation and predicted risks can be altered according to survivor's future lifestyle habits. Secondary malignancy risks were generally lower with Proton-CSI based on several different risk models. In light of Proton-CSI and Photon-CSI delivering similar neural-axis dose, Proton-CSI might not significantly reduce secondary malignancy risks compared to Photon-CSI as documented secondary cancers were mainly from the brain.
Conclusion
Overall, Proton-CSI conferred better treatment outcomes than Photon-CSI for paediatric medulloblastoma patients. This review serves to compare the current literature in the absence of long term data from prospective studies. Proton-CSI should be used with caution while more prospective studies are awaited to reveal its true clinical benefit for paediatric medulloblastoma.

EP-1382 Feasibility of Proton therapy with concomitant Chemotherapy for atypical teratoid rhabdoid tumors
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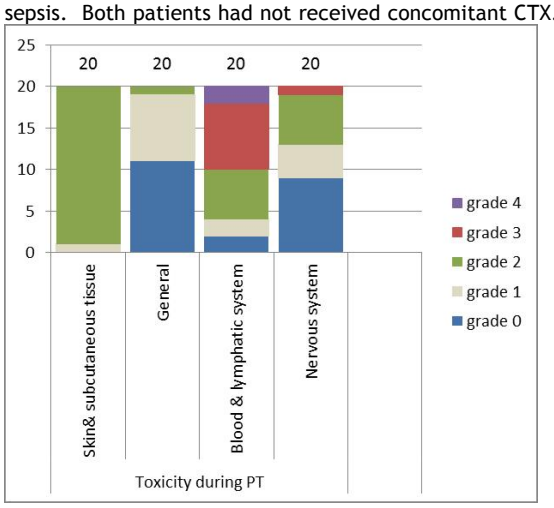
Purpose or Objective
Atypical teratoid rhabdoid tumors (AT/RT) are a rare and highly aggressive disease mostly in infants. Therapy of affected patients requires an intensive multidimensional multimodality treatment concept of surgery, chemotherapy (CTX) and radiotherapy (RT) even in the very young patients. RT takes place either after the end of CTX or concomitant to CTX. Still, there is concern, that intensive combined treatment may not be feasible. We therefore aimed to investigate events of treatment prolongation and hospitalization during proton beam therapy (PT) and concomitant CTX.
Material and Methods
All patients treated at WPE with PT between 2013 and 2016 were prospectively enrolled in the Registry Study for children (KiProReg). Informed consent was obtained from their legal representatives. All patients underwent weekly examinations by radiation and pediatric oncologists. Acute side effects according to CTCAE 4.0., time of hospitalization and prolongation of PT were documented. Hospitalization and treatment interruption was only taken into account if caused by complications.
Results
Twenty patients (6 females; 14 males) with a median age of 2.0 years at the start of PT (range, 1.0 - 8.0 years) were enrolled. Twelve patients received local PT up to 54 Gy only; six received an additional boost with a final dose of 59.4 Gy; 2 received craniospinal irradiation plus local boost up to 55.6 Gy. 19 of them required deep sedation during PT. Nine patients had concomitant chemotherapy (RCT) consisting of ifosfamide, carboplatinum, etoposide and/or vincristine, cyclophosphamide. Patients with RCT received an average of 1.4 cycles (range 1.0-3.0). Seven patients (35%) had an episode of fever; four of them received RCT. Acute toxicity during PT is displayed in graph 1. Nine patients (45%) had to be admitted of whom 5 (25%) received concomitant CTX. The duration of hospitalization varied between one and 49 days (average 9.7). Six patients were hospitalized for a period less than five days. Prolonged hospitalization in the three cases was caused by bad nutritional status present already before the start of PT, Norovirus infection and Staphylococcus epidermidis infection, respectively. Average hospitalization of patients with RCT was 3.0 days (range 1.0-21.0 d) with PT only 5.5 days (range 1.0-49.0 d). In two patients (10%) PT had to be interrupted either three or four days. Reasons were viral respiratory infection in one case and bacterial port-a-cath and subsequent

sepsis. Both patients had not received concomitant CTX.



Conclusion

Our evaluation did not reveal relevant prolongation of treatment due to RCT strategy when administering proton beam therapy in very young patients according to EU-RHAB. However, experienced, multidisciplinary teams have to carefully accompany these very young patients in order to appropriately manage treatment complications and to avoid treatment interruptions potentially jeopardizing treatment efficacy.

Electronic Poster: Clinical track: Palliation

EP-1383 Evaluation of QOL and psychological response in patients treated with palliative radiotherapy

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Purpose or Objective

Usually, evaluation of palliative radiotherapy is made by physical findings or levels of pain relief. But little is known about patient quality of life (QOL), psychophysiological response, and assessment of adverse effect from the view point of QOL. We evaluated the effects of palliative radiotherapy for cancer recurrence or metastasis on patient QOL and psychophysiology.

Material and Methods

A total of 67 patients who received palliative radiotherapy between 2014 and 2015 were enrolled. Patient diseases were bone metastasis in 51 patients, lymph node metastasis in 7 patients, brain metastasis in 2 patients, local recurrence in 3 patients, and the others in 4 patients. Median irradiated dose was 30 Gy in 10 fractions for palliative radiotherapy. We used the questionnaires EORTC-QLQ-C30 and EORTC-QLQ-C15-PAL to evaluate patient QOL and the Hospital Anxiety and Depression Scale (HADS) to evaluate patient mental healthcare at the start and at the end of radiotherapy.

Results

As compared to scores at the start of radiotherapy, at the end of radiotherapy, numerical rating scale (NRS) and face scale significantly decreased. On the other hand, Eastern Cooperative Oncology Group Performance Status (ECOG PS) did not show no changes during palliative radiotherapy. In functional scales, average scores of role functioning (RF2) and emotional functioning (EF) also improved. In symptom scales, average scores of fatigue (FA), pain (PA), and insomnia (SL) improved. In bone metastasis group, global health status / QOL (QL2), PA, and SL significantly improved. After palliative radiotherapy, anxiety score of HADS was elevated below age of 70 years. There was relationship between anxiety improvement and QOL improvement after palliative radiotherapy. Nausea and vomiting scores of EORTC-QLQ-C15-PAL were associated with the irradiated volume of palliative radiotherapy for pelvic region.

Conclusion

Patient QOL of was improved by palliative radiotherapy regardless of PS. The possibility of palliative radiotherapy having a positive influence on patient psychophysiology was also suggested in younger age.

EP-1384 Concomitant Use of Steroids and Immunotherapy in Cancer Patients: A Comprehensive Review

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Purpose or Objective

A large number of clinical trials studying immune checkpoint inhibitors exclude cancer patients who are on corticosteroids. This is based on the biological hypothesis that corticosteroids may antagonize the therapeutic effects of immunotherapy. Corticosteroids are routinely prescribed for their analgesic, antiemetic and anti-inflammatory properties, such as in the palliation of metastatic disease to the central nervous system. We sought to review the literature looking at the clinical outcomes of patients with solid or hematologic cancers who are treated with immunotherapy and concomitant corticosteroids.

Material and Methods

Using Medline (via Ovid) and Embase (via Ovid), a literature search was performed from January 2000 to October 2, 2016 with no limits or language restrictions. Identified articles included variations of the terms immunotherapy drugs, steroids and cancer. These were found in the Title/Abstract/Keywords, and in the Medical Subject Headings (MeSH) and Emtree terms thesaurus. A validated adverse effects search filter was used to help with the retrieval of relevant results. A clinician reviewed all titles and abstracts. Full articles of selected studies were retrieved for further analysis of clinical/ radiological disease progression and survival outcomes.

Results

Following a retrieval of 3611 unique references, 155 abstracts were retained for review. Twelve articles were retained for final analysis. The first nine articles/ abstracts consisted of case reports, case series and phase I-II trials of patients on CTLA-4 blockade therapy for metastatic melanoma and clear-cell renal cell carcinoma (RCC). Cohorts varied from 1 to 198 patients, including some patients with auto-immune disorders. They reported that the use of corticosteroids for the management of immune-related adverse events (irAEs) did not negatively impact objective clinical response. Of note, the above mentioned articles had not prospectively planned to analyze patient-related outcomes based on the use of corticosteroids. The tenth paper explored the use of colitis prophylaxis with Budesonide in patients receiving CTLA-4 blockade in a randomized phase II trial. In patients treated in the Budesonide arm, there was no statistically significant difference in oncologic outcomes. The final two publications describe objective clinical responses in patients treated with a combination of pembrolizumab, pomalidomide and dexamethasone for heavily treated relapsed/ refractory multiple myeloma patients.

Conclusion

The reviewed published data seems to suggest that the addition of corticosteroids to immunotherapy may not