The utility of routine surveillance screening with magnetic resonance imaging to detect tumour recurrence/progression in children with high-grade central nervous system tumours

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DOI:
10.1002/pbc.27509

SUPPLEMENTARY FILE S1 Search strategy

Searches for published studies were undertaken using the following databases: MEDLINE (OvidSP); MEDLINE In-Process Citations & Daily Update (OvidSP); EMBASE (OvidSP); Cochrane Database of Systematic Reviews (CDSR)(Wiley); Cochrane Central Register of Controlled Trials (CENTRAL)(Wiley); CINAHL Plus (EBSCO); DARE (CRD website); HTA (CRD website).

The search strategy for Medline (OvidSP) 1985 – August week 1, 2018, is as follows:

1. Glioma/ or Brain Neoplasms/ or Meningioma/ or Glioblastoma/ or Astrocytoma/
2. ((brain or brainstem or intracranial or posterior fossa) adj3 (cancer* or carcinom* or tumor* or tumour* or neoplasm*)).mp.
3. (Astrocytoma* or Brain Stem Glioma* or Medulloblastoma*or Primitive Neuroectodermal Tumo?r* or ganglioneuroblastoma* or CNS neuroblastoma* or Ependymoblastoma or Medulloepithelioma or Pineal Parenchymal Tumour* or (Atypical Teratoid adj1 tumo?r*) or Oligoastrocytoma or ((Pilocytic or Gemistocytic) adj1 astrocytoma*) or ependymoma or primitive neuroectal tumo?r*).mp.
4. (((Diffuse fibrillary or Gemistocytic or Pilocytic Pilomyxoid Protoplasmic Subependymal giant cell) adj1 astrocytoma*) or Oligoastrocytoma or Oligodendroglioma or Oligoastrocytoma or Pleomorphic xanthoastrocytoma or ((astrocytoma or oligoastrocytoma or oligodendroglioma) adj1 astrocytoma*) or Glioblastoma or Gliomatosis cerebri or Gliosarcoma or ((diffuse intrinsic pontine glioma or low grade brain stem) adj1 glioma) or ((classic or desmoplastic or nodular or large cell or nodularity) adj1 medulloblastoma*) or Primitive Neuroectodermal Tumo?r* or ((ganglioneuroblastoma or neuroblastoma) adj 1central nervous system*) or Ependymoblastoma or Pineoblastoma or pineal parenchymal tumo?r* or (central nervous system adj1 atypical teratoid) or (central nervous system adj 1 rhabdoid tumo?r*) or Germinomas or ((immature or mature or malignant transformation) adj2 teratomas)).mp.
5. 1 or 2 or 3 or 4
6. exp Surgical Procedures, Operative/
7. surg*.mp.
8. debulk*.mp.
9. cytoreduc*.mp.
10. 6 or 7 or 8 or 9
11. (chemotherap* or antineoplastic agents or cytotoxic or alkylating agents or nitrosoureas or antimetabolite* or antitumor?r or ((antibod* or monoclonal) adj 3 Human*) or plant alkyloid* or (hormone* adj 1 agent*) or anthracycline* * or systemic therap*).mp.
12. (Everolimus or Afinitor or Cetuximab or Erbitux or Bevacizumab or Avastin or Cediranib or Recentin or lomustine or CCNU or CeeNU or carmustine or BiCNU or Carustine or Ethylnitrosourea or Streptozocin or Sorafenib or Nexavar or tipifarnib or Zarnestra or Erlotinib or Tarceva or Sorafenib or Nexavar or temsirolimus or Torisel or Sunitinib or Sutent or irinotecan or Camptosar or Campto or Vandetanib or Caprelsa or Cabozantinib or Cometriq or XL184 or Axitinib or AG013736 or Inlyta).mp.
13. 11 or 12
14. exp Immunotherapy/ae, cl, ct, mt, mo, nu, px, st
15. exp Genetic Therapy/ae, cl, ct, mt, mo, nu, ut
16. exp Imaging, Three-Dimensional/ or exp Whole Body Imaging/ or exp Magnetic Resonance Imaging/
17. exp Tomography, Emission-Computed/ or exp Four-Dimensional Computed Tomography/ or exp Tomography/ or exp Tomography, Emission-Computed, Single-Photon/ or exp Positron-Emission Tomography/
18. 16 or 17
19. (radiation therapy or radiotherap* or intensity modulat* radiotherapy*or radiosurgery or radiation oncology or reduced boost volume radiotherap* or hyper fractionat* stereotactic radiotherap*or adjuvant radiotherap* or body radiotherap* stereotactic*or computer assisted radiotherap*or computer assisted radiotherap*planning or conformal radiotherap* or dosage* radiotherap* or dose fractionation* radiotherap* or high energy radiotherap*or implant radiotherap*or intensity or modulated radiotherap*or interstitial radiotherap*orimage guided radiotherap*or stereotactic*guid* radiotherap* or local therap* or proton therap* or proton adj2 therap* or proton beam therap* or proton adj2 radiation or proton radiation therap* or proton adj2 radiotherap* or proton adj2 irradia* or PBT).mp.
20. 10 or 13 or 14 or 15 or 18 or 19
21. 5 and 20
22. (Response or overall survival or progression* free survival or event* free survival or time to recurrence or time to progression or disease* free interval* or endocrinopath* or ((growth or thyroid) adj 1 hormone adj 3 deficienc*) or ((glucocorticoid or gonadotropin) adj 3 deficienc*) or endocrine dysfuct* or (cardiac function* adj 3 impair*) or ataxia or spastic paresis or visual dysfunction or epilepsy or hemiparesis or neurolog* deficit*).mp.

23. 21 and 22
24. limit 23 to (yr="1985 -Current" and ("newborn infant (birth to 1 month)" or "infant (1 to 23 months)" or "preschool child (2 to 5 years)" or "child (6 to 12 years)" or "adolescent (13 to 18 years)" or "young adult (19 to 24 years)") and humans)

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SUPPLEMENTARY FILE S2 Data extraction and quality assessment proforma

Study demographics	
Study Name / ID:	
Investigator group/study name:	
Hospital and country conducted:	
Single or multi-institutional study:	
Study title:	
Study objectives:	
Publication status of paper:	
Is the study linked to other papers? (state):	
Study design:	
Years of study:	
Overall trial N:	
Population / Study eligbility	
General tumour type(s):	
Tumour subtype(s) (N) :	
Tumour location:	
Tumour grade:	
Age: (median, range: mean; SD):	
Male: Female N (%)	
Inclusion criteria:	
Exclusion criteria:	
Baseline data	
Previous treatments:	
Response after previous treatments:	
In the case of surgery, extent of resection:	
Imaging modality used to determine post-operative status:	
Intervention(s)	
Intervention:	
MRI protocol and planning (including plane(s), weighting and contrast enhancement)	
Treatment intent (curative or palliative)	
Concomitant therapy:	
Outcome definitions:-	
Post-operative MRI scan:	
Surveillance MRI scan:	
Symptomatic:	
Asymptomatic:	
Definition of (radiographic) recurrence / progression:	
Overall survival (OS):	
Event-free survival (EFS):	
Recurrence-free survival (RFS):	
Progression-free survival (PFS):	
Measurement of tumour response:	
Short-term adverse events (toxicity)	
Long-term adverse events	
Results	
N in analysis:	
Average duration of follow-up (range):	
Average frequency of MRI surveillance imaging	

(range):	
Average number of surveillance MRI images per patient (range):	
Patients with Recurrent disease (n):	
Average age at recurrence (range):	
Average time-to-recurrence / progression (range):	
Frequency of MRI-detected recurrence / detection rate:	
Changes in patient treatment due to recurrence:	
Median survival:	
Overall survival (OS):	
Event-free survival (EFS):	
Recurrence-free survival (RFS):	
Progression-free survival (PFS):	
Tumour response rates:	
Short-term adverse events (toxicity)	
Long-term adverse events	
Quality of survival:	
Measures of family psychological functioning and anxiety:	
Analysis	
Methods of analysis (ITT or per protocol):	
Statistical tests used (state; comment)	
Conclusions	
Authors conclusions:	
Reviewers conclusions:	

Study Quality Assessment		**Y/N**
1.	Is the study based on a representative sample selected from the relevant population?	
2.	Are the criteria for inclusion explicit?	
3.	Were all individuals who entered the study, at a similar timepoint in their disease progression?	
4.	Was follow-up long enough for important outcomes to occur?	
5.	Were outcomes assessed using objective criteria or was blinding used?	
6.	If comparisons of sub-series are being made, was there sufficient description of the series and distribution of prognostic factors?	
Reviewer comments:		

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