Brain Tumours

Disclaimer

Contents

Red Flags

- Suspected raised intracranial pressure
- Suspect high-grade glioma

Background – About Brain Tumours

- Brain tumours may be primary or secondary (metastatic), benign, or malignant.
- Secondary brain tumours commonly metastasise from skin, lung, breast, kidney, and bowel.
- The WHO classification of brain tumours is based on:
    - cell of origin and its specific genotype. Currently there are more than 120 types.
    - cell behaviour from Grade I (least malignant) to Grade IV (most malignant).
- High grade gliomas (glioblastoma multiforme) are a common primary brain tumour and have an aggressive course if left untreated.
    - Treatment options include surgery, chemotherapy, and radiation, and may include experimental clinical trials
    - Management requires a comprehensive team of care givers to support the patient and immediate carers and provide information to help make treatment choices.
    - With improvements in treatment, some people may become long term survivors of this disease.
- Other primary brain tumours include:
    - Medulloblastoma – high grade tumour that originates in the cerebellum.
    - Meningioma – benign tumour of the meninges.
    - Pituitary tumour – adenomas are the most common intracranial neoplasm.
    - Schwannoma – tumour that originates from Schwann cells.

Assessment

1. Take a history – ask specifically about:

- ***symptoms suggesting brain tumour.***
    - *Headache – persistent, progressive, often present on waking and associated with vomiting*
    - *Seizures – occur in 30% of patients with brain tumours and include:*
        - *generalised tonic clinic seizures*
        - *partial seizures – Can be either simple, (patient is awake and aware) or complex (patient has impaired awareness) e.g.:*
            - *Simple parietal sensory seizure – change in sensation, vision, smell and/or hearing without losing consciousness*
            - *Simple partial motor seizure – repetitive, unintentional movements, such as twitching, jerks, spasms*
            - *Complex partial seizures, arising from temporal lobe – visual or auditory hallucinations, awareness of abnormal taste, feelings of fear, déjà vu, and maybe associated with repetitive, unintentional movements, such as twitching*
        - *Blackouts or other alterations in conscious state*
        - *Poor coordination*
        - *Visual deterioration*
        - *Progressive weakness*
        - *Change in behaviour*
        - *Change in memory*
        - *Confusion, drowsiness*

- *Speech disturbance*
- *Other unexplained neurological symptoms*

- ***risk factors for high grade glioma.*** (Note the presence of multiple signs and symptoms, particularly in combination with other underlying risk factors, indicates an increased risk of high-grade glioma.)

  Risk factors for high grade glioma

  - *Age (over 40 years)*
  - *Gender – 1.5 times more common in males*
  - *Race – Twice as common in people of Caucasian descent*
  - *Exposure to ionising radiation, vinyl chloride, pesticides, petroleum refining, synthetic rubber manufacturing*
  - *Certain hereditary syndromes such as:*
    - *neurofibromatosis type 1 and 2*
    - *Li Fraumeni syndrome*
    - *Turcot syndrome*
    - *multiple endocrine neoplasia type 1*
    - *Lynch syndrome*
    - *Gorlin-Gotz syndrome*
    - *tuberous sclerosis complex*
    - *Cowden disease.*

  There is a common myth around mobile phone usage increasing risk of cancer, in particular glioma. Current research indicates that there are no established health effects from the mobile phone usage (ARPANSA 2016).

- current or previous history of cancer, particularly skin, lung, breast, kidney, bowel.
- any other symptoms, e.g. respiratory, gastrointestinal, urological, general.
- any recent investigations.

2. Perform examination:

- Vital signs including blood pressure
- General examination, particularly for adenopathy, organomegaly
- Perform a ***brief neurological examination***.

  Brief neurological examination

  - *Designed by neurologists to exclude sinister causes of headache including brain tumour and haemorrhage.*
  - *Suitable for patients whose history suggests migraine or tension-type headaches. Full neurological exam is recommended for all other patients.*

	Examination	***Notes***
1	*Romberg's test*	*Test is positive if the patient sways or falls with eyes closed and indicates proprioceptive dysfunction. Patients with cerebellar lesions will fall or sway with eyes open or closed.*
2	*Tandem gait test*	*Heel-to-toe walking. Tests balance but is non-specific. Difficulty with this task can be due to weakness, poor position sense, vertigo, leg tremors, or a cerebellar lesion. Elderly patients typically have difficulty with tandem gait.*
3	*Walking on heels*	*Tests pyramidal tract.*

4	*Drift of outstretched arms*	*Tests pyramidal tract.*
5	*Finger-nose test*	*Tests coordination.*
6	*Visual acuity and visual fields to confrontation*	
7	*Face movements and symmetry*	
8	*Blood pressure and temperature*	
9	*Language assessment*	*An assessment of language observed during history taking (problems with comprehension and word finding difficulty and slurred speech).*

- Consider examination of:
  Cranial nerves

Nerve and sensory function	***Motor function***	***Reflex***	***Assess***
Olfactory - Smell			*Smell in each nostril*
Optic – Vision		• *Pupillary light reflex (afferent limb)* • *Accommodation reflex(afferent limb)*	• *Visual acuity (Snellenv chart)* • *Visual fields (confrontation)* • *Pupils (pen torch)* • *Accommodation* • *Fundoscopy*
Oculomotor	• *Eye movements (medial rectus, superior rectus, inferior rectus, and inferior oblique)* • *Eyelid movement*	• *Pupillary light reflex (efferent limb)* • *Accommodation reflex (efferent limb)*	• *Eye movements (horizontal abduction and movement up and down)* • *Eyelids (check for ptosis)* • *Pupils* • *Accommodation*
Trochlear	*Eye movements (superior oblique)*		*Eye movements (down and in)*
Trigeminal – Facial sensation	*Jaw movements*	• *Corneal reflex (afferent limb)* • *Jaw jerk*	• *Facial sensation (noting distribution of V1, V2, and V3)* • *Sensation of anterio2/3rds of tongue* • *Jaw opening and closure (masseter, temporalis, and pterygoid muscles)*

			• *Corneal reflex (with cotton wool)* • *Jaw jerk*
Abducens	*Eye movements (lateral rectus)*		*Eye movement (horizontal abduction)*
Facial	*Facial muscles*	*Corneal reflex (efferent limb)*	• *Test facial muscles against resistance e.g., raise eyebrows, close eyes* • *An upper motor neuron lesion will result in contralateral paralysis of the lower face only* • *A lower motor neuron lesion will result in ipsilateral paralysis of the upper and lower face*
Vestibulocochlear – Hearing and balance			• *Rinne test – normal or possible sensorineural deafness if air conduction is greater than bone conduction. Suspect conductive deafness if bone conduction greater than air conduction.* • *Weber test – sound lateralises to abnormal side in conductive deafness, and normal side in sensorineural deafness.*
Glossopharyngeal – Posterior 1/3rd of tongue		*Gag reflex (afferent limb)*	*Gently touch back of throat with tongue depressor, warning patient prior to doing so*
Vagus	• *Palatal movement* • *Vocal cord movement*	*Gag reflex (efferent limb)*	• *Ask patient to say "Ah" and watch for symmetrical movement* • *Ask patient to repeat a sentence e.g., "West Register Street"*
Accessory	• *Shoulder elevation (trapezius muscle)* • *Head rotation (sternomastoid muscles)*		*Test shoulder elevation and head rotation against resistance*

Hypoglossal	*Tongue protrusion and movement*		• *Observe tongue for any asymmetry, atrophy, or fasciculations* • *Test tongue power against cheeks*

- ***Upper and lower limbs***
  Assess for:
  - *Symmetry, muscle wasting, fasciculations, clonus*
  - *Tone*
  - *Power:*
    - *0 = no movement*
    - *1 = flicker of contraction*
    - *2 = movement with gravity eliminated*
    - *3 = movement against gravity*
    - *4 = active movement against gravity and resistance*
    - *5 = normal power*
  - *Reflexes:*
    - *Biceps jerk (C5, C6)*
    - *Triceps jerk (C7, C8)*
    - *Brachioradialis jerk (C5, C6)*
    - *Finger jerk (C8)*
    - *Knee jerk (L3, L4)*
    - *Ankle jerk (S1, S2)*
    - *Plantar reflex (L5, S1, S2)*
  - *Sensation:*
    - *Pinprick*
    - *Light tough*
    - *Vibration (128Hz tuning fork)*
    - *Proprioception*
  - *Coordination:*
    - *Finger-nose test*
    - *Heel-shin test*

- Consider Mini-Mental State Examination – available in most practice software.

3. Arrange urgent neurosurgery assessment prior to investigations if suspect:
- raised intracranial pressure. Progressive, severe morning headache, with vomiting, drowsiness, or deterioration in level of consciousness.
- high-grade glioma suspected based on the presence of multiple signs and symptoms, particularly in combination with other underlying risk factors.

4. Consider arranging investigations:
- MRI brain – GP bulk-billed for the following indications:
  - Unexplained seizures
  - Unexplained chronic headache with suspected intracranial pathology
- CT scan – generally the modality of choice for assessment of acute intracranial conditions however, soft tissue resolution is inferior to MRI.
- Routine blood tests – FBE, electrolytes, urea, and creatinine, LFTs, CRP, ESR
- Consider CT chest, abdomen, and pelvis in patients with previous or current known malignancy.

Management

If patient identifies as Aboriginal or Torres Strait Islander, understand their ***specific cultural and spiritual needs when*** discussing and delivering treatment options, including eligibility for Integrated Team Care (ITC) services.

Cultural and spiritual considerations for Aboriginal and Torres Strait Islander People

- *Offer referral to culturally appropriate social and emotional wellbeing services.*
- *Consider including an expert in the multidisciplinary team, to provide culturally appropriate care to Aboriginal and Torres Strait Islander people.*
- *Provide culturally appropriate information or resources about the signs and symptoms of recurrent disease, secondary prevention, and healthy living.*

Prior to diagnosis

1. Arrange immediate neurosurgery assessment if:
   - features of raised intracranial pressure.
   - assessment suggests high-grade glioma. Optimal Cancer Pathways suggest review within 24 hours of onset of symptoms

2. Refer all patients with newly diagnosed symptomatic intracranial tumours for urgent neurosurgery assessment.
   - The Alfred – click here
   - Monash Hospital - click here
   - Peninsula Health – click here

3. Provide information to patient and carers
   - Treatment will be individualised depending on the type of tumour and patient's general health
   - Until formerly assessed avoid driving or using heavy machinery
   - Use simple analgesia for headaches and other symptoms

4. If incidental asymptomatic benign intracranial tumour with no neurological deficit or mass effect on imaging, e.g., meningiomas and non-functioning pituitary adenomas, request routine neurosurgery assessment.
   - The Alfred – click here
   - Monash Hospital - click here
   - Peninsula Health – click here

Support following diagnosis

1. Ensure clear communication with neurosurgical team lead clinician. Discuss:
   - type and stage of brain tumour.
   - treatment objectives**.**

     Treatment objectives
     - *Based on type, size and stage of tumour*
     - *Patient's general health and wishes*
     - *For patients with high-grade glioma, treatment is limited to:*
       - *longer term survival without expectation of cure*
       - *maintenance of quality of life*
       - *symptom palliation.*

2. For high-grade glioma management or other Grade III to IV tumours:
    - ensure patient and family is informed and involved in management decisions.
    - consider the ***supportive care domains*** in consultation with neurosurgical team.

      Supportive care domains
      Supportive care in cancer refers to the following five domains:
        - *Physical domain, which includes a wide range of physical symptoms that may be acute, relatively short-lived or ongoing, requiring continuing interventions or rehabilitation.*
        - *Psychological domain, which includes a range of issues related to the patient's mental health wellbeing and personal relationships.*
        - *Social domain, which includes a range of social and practical issues that will affect the patient, carer and family such as the need for emotional support, maintaining social networks and financial concerns.*
        - *Information domain, which includes access to information about cancer and its treatment, recovery and survivorship support services and the health system overall.*
        - *Spiritual domain, which focuses on the patient's changing sense of self and challenges to their underlying beliefs and existential concerns.*

      Source: Cancer Council – Optimal Care Pathway for People With High-Grade Glioma Cancer: Appendix: Supportive Care

    - provide support and counselling using the following resources:
        - Cancer Council including Cancer Connect helpline: **13 11 20**
        - Brain Tumour Alliance Australia – has an extensive list of resources

    - Involve Palliative Care Australia early to improve quality of life. See related pathways:
        - Advanced Care Planning (ACP)
        - GP Palliative Care Resources
        - New Palliative Care Patient

Referral

- Arrange immediate neurosurgery assessment if:
    - features of raised intracranial pressure.
    - assessment suggests high grade glioma.
- If newly diagnosed symptomatic intracranial tumours, arrange urgent neurosurgery assessment.
    - The Alfred – click here
    - Monash Hospital - click here
    - Peninsula Health – click here
- If incidental asymptomatic benign intracranial tumour with no neurological deficit or mass effect on imaging, arrange routine neurosurgery assessment.
- If Aboriginal or Torres Strait Islander patient, offer referral to ***specific Aboriginal and Torres Strait Islander services.*** For all referrals, to both mainstream and Indigenous services, ensure Indigenous status is clearly marked on the referral.

Referral Options for Aboriginal and Torres Strait Islander people

- *For hospital referrals, consider engaging support from the Aboriginal Hospital Liaison Officers.*
- *For community referrals, consider referral to an Aboriginal Community Controlled Health service.*
- *For care coordination, support and advocacy throughout treatment, consider referral to Integrated Team Care Program.*

Information

For health professionals

Further information

- Brain Tumour Alliance Australia
- Cancer Council Australia – Optimal Care Pathway for People With High-Grade Glioma Cancer

For patients

- Brain Tumour Alliance Australia [Has a list of useful resources to support patients with brain cancer and their carers. Some of the resources are available in multiple languages. BTAA also maintains a list of peer support groups.]
- Cancer Council phone **13-11-20** [A confidential telephone support service available to anyone affected by cancer.]
- Canteen [Helps adolescents, young adults and parents to cope with cancer in their family. Canteen offers individual support services, peer support services and a youth cancer service, as well as books, resources and useful links.]

References

Select bibliography

Optimal cancer care pathway for people with high-grade glioma. NSW: Cancer Council; 2016.

Disclaimer

Last updated: October 2020