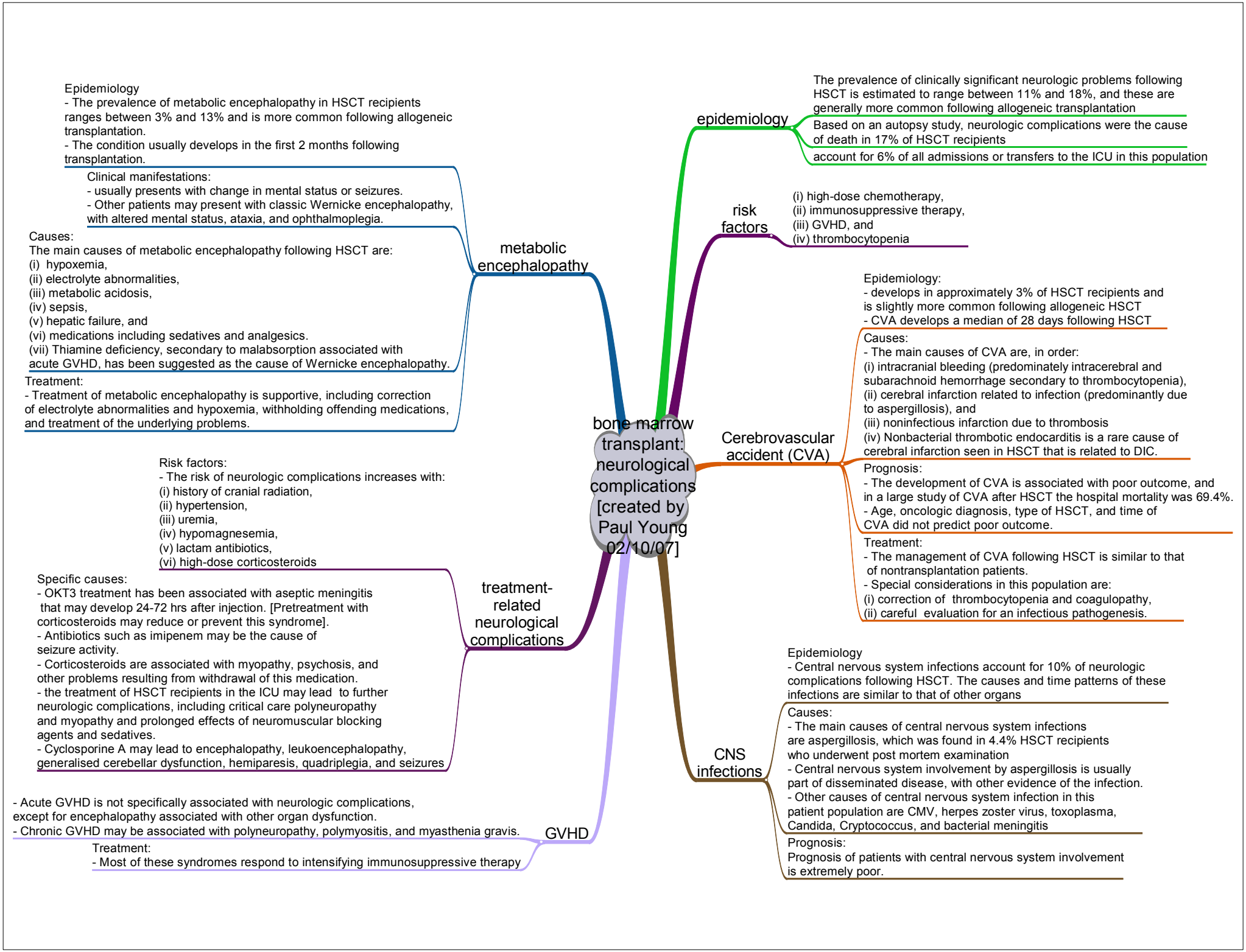
bone marrow transplant: neurological complications [created by Paul Young 02/10/07]
metabolic encephalopathy
Epidemiology
- The prevalence of metabolic encephalopathy in HSCT recipients ranges between 3% and 13% and is more common following allogeneic transplantation.
- The condition usually develops in the first 2 months following transplantation.
Clinical manifestations:
- usually presents with change in mental status or seizures.
- Other patients may present with classic Wernicke encephalopathy, with altered mental status, ataxia, and ophthalmoplegia.
Causes:
The main causes of metabolic encephalopathy following HSCT are:
(i) hypoxemia,
(ii) electrolyte abnormalities,
(iii) metabolic acidosis,
(iv) sepsis,
(v) hepatic failure, and
(vi) medications including sedatives and analgesics.
(vii) Thiamine deficiency, secondary to malabsorption associated with acute GVHD, has been suggested as the cause of Wernicke encephalopathy.
Treatment:
- Treatment of metabolic encephalopathy is supportive, including correction of electrolyte abnormalities and hypoxemia, withholding offending medications, and treatment of the underlying problems.
treatment-related neurological complications
Risk factors:
- The risk of neurologic complications increases with:
(i) history of cranial radiation,
(ii) hypertension,
(iii) uremia,
(iv) hypomagnesemia,
(v) lactam antibiotics,
(vi) high-dose corticosteroids
Specific causes:
- OKT3 treatment has been associated with aseptic meningitis that may develop 24-72 hrs after injection. [Pretreatment with corticosteroids may reduce or prevent this syndrome].
- Antibiotics such as imipenem may be the cause of seizure activity.
- Corticosteroids are associated with myopathy, psychosis, and other problems resulting from withdrawal of this medication.
- the treatment of HSCT recipients in the ICU may lead to further neurologic complications, including critical care polyneuropathy and myopathy and prolonged effects of neuromuscular blocking agents and sedatives.
- Cyclosporine A may lead to encephalopathy, leukoencephalopathy, generalised cerebellar dysfunction, hemiparesis, quadriplegia, and seizures
GVHD
- Acute GVHD is not specifically associated with neurologic complications, except for encephalopathy associated with other organ dysfunction.
- Chronic GVHD may be associated with polyneuropathy, polymyositis, and myasthenia gravis.
Treatment:
- Most of these syndromes respond to intensifying immunosuppressive therapy
epidemiology
The prevalence of clinically significant neurologic problems following HSCT is estimated to range between 11% and 18%, and these are generally more common following allogeneic transplantation
Based on an autopsy study, neurologic complications were the cause of death in 17% of HSCT recipients
account for 6% of all admissions or transfers to the ICU in this population
risk factors
(i) high-dose chemotherapy,
(ii) immunosuppressive therapy,
(iii) GVHD, and
(iv) thrombocytopenia
Cerebrovascular accident (CVA)
Epidemiology:
- develops in approximately 3% of HSCT recipients and is slightly more common following allogeneic HSCT
- CVA develops a median of 28 days following HSCT
Causes:
- The main causes of CVA are, in order:
(i) intracranial bleeding (predominately intracerebral and subarachnoid hemorrhage secondary to thrombocytopenia),
(ii) cerebral infarction related to infection (predominantly due to aspergillosis), and
(iii) noninfectious infarction due to thrombosis
(iv) Nonbacterial thrombotic endocarditis is a rare cause of cerebral infarction seen in HSCT that is related to DIC.
Prognosis:
- The development of CVA is associated with poor outcome, and in a large study of CVA after HSCT the hospital mortality was 69.4%.
- Age, oncologic diagnosis, type of HSCT, and time of CVA did not predict poor outcome.
Treatment:
- The management of CVA following HSCT is similar to that of nontransplantation patients.
- Special considerations in this population are:
(i) correction of thrombocytopenia and coagulopathy,
(ii) careful evaluation for an infectious pathogenesis.
CNS infections
Epidemiology
- Central nervous system infections account for 10% of neurologic complications following HSCT. The causes and time patterns of these infections are similar to that of other organs
Causes:
- The main causes of central nervous system infections are aspergillosis, which was found in 4.4% HSCT recipients who underwent post mortem examination
- Central nervous system involvement by aspergillosis is usually part of disseminated disease, with other evidence of the infection.
- Other causes of central nervous system infection in this patient population are CMV, herpes zoster virus, toxoplasma, Candida, Cryptococcus, and bacterial meningitis
Prognosis:
Prognosis of patients with central nervous system involvement is extremely poor.