

Chapter 8

Immune system and malignant disease

CONTENTS

Immune system	page 557
1 Immune system disorders and transplantation	557
1.1 Multiple sclerosis	568
Malignant disease	570
1 Antibody responsive malignancy	570
2 Cytotoxic responsive malignancy	575
2.1 Cytotoxic drug-induced side effects	599

2.1a Hyperuricaemia associated with cytotoxic drugs	page 601
3 Immunotherapy responsive malignancy	602
4 Targeted therapy responsive malignancy	603

Immune system

1 Immune system disorders and transplantation

Immune response

Inflammatory bowel disease

Azathioprine p. 558, mercaptopurine p. 587, or once weekly methotrexate p. 588 are used to induce remission in unresponsive or chronically active Crohn's disease. Azathioprine or mercaptopurine may also be helpful for retaining remission in frequently relapsing inflammatory bowel disease; once weekly methotrexate is used in Crohn's disease when azathioprine or mercaptopurine are ineffective or not tolerated. Response to azathioprine or mercaptopurine may not become apparent for several months. Folic acid p. 620 should be given to reduce the possibility of methotrexate toxicity. Folic acid is usually given weekly on a different day to the methotrexate; alternative regimens may be used in some settings.

Ciclosporin (cyclosporin) p. 559 is a potent immunosuppressant and is markedly nephrotoxic. In children with severe ulcerative colitis unresponsive to other treatment, ciclosporin may reduce the need for urgent colorectal surgery.

Immunosuppressant therapy

Immunosuppressants are used to suppress rejection in organ transplant recipients and to treat a variety of chronic inflammatory and autoimmune diseases. Solid organ transplant patients are maintained on drug regimens, which may include antiproliferative drugs (azathioprine or mycophenolate mofetil p. 566), calcineurin inhibitors (ciclosporin or tacrolimus p. 562), corticosteroids, or sirolimus p. 561. Choice is dependent on the type of organ, time after transplant, and clinical condition of the patient. Specialist management is required and other immunomodulators may be used to initiate treatment or to treat rejection.

Impaired immune responsiveness

Infections in the immunocompromised child can be severe and show atypical features. Specific local protocols should be followed for the management of infection. Corticosteroids may suppress clinical signs of infection and allow diseases such as septicaemia or tuberculosis to reach an advanced

stage before being recognised. Children should be up-to-date with their childhood vaccinations before initiation of immunosuppressant therapy (e.g. before transplantation); vaccination with varicella-zoster vaccine is also necessary during this period—**important**: normal immunoglobulin administration should be considered as soon as possible after measles exposure, and varicella-zoster immunoglobulin (VZIG) is recommended for individuals who have significant chickenpox (varicella) exposure. Specialist advice should be sought on the use of live vaccines for those being treated with immunosuppressive drugs.

Antiproliferative immunosuppressants

Azathioprine is widely used for transplant recipients and it is also used to treat a number of auto-immune conditions, usually when corticosteroid therapy alone provides inadequate control. It is metabolised to mercaptopurine, and doses should be reduced (to one quarter of the original dose in children) when allopurinol p. 601 is given concurrently.

Mycophenolate mofetil is metabolised to mycophenolic acid which has a more selective mode of action than azathioprine.

There is evidence that compared with similar regimens incorporating azathioprine, mycophenolate mofetil may reduce the risk of acute rejection episodes; the risk of opportunistic infections (particularly due to tissue-invasive cytomegalovirus) and the occurrence of blood disorders such as leucopenia may be higher. Children may suffer a high incidence of side-effects, particularly gastrointestinal effects, calling for temporary reduction in dose or interruption of treatment.

Cyclophosphamide p. 579 is less commonly prescribed as an immunosuppressant.

Corticosteroids and other immunosuppressants

The corticosteroids prednisolone p. 478 and dexamethasone p. 475 are widely used in paediatric oncology; they have a marked antitumour effect. Dexamethasone is preferred for acute lymphoblastic leukaemia whilst prednisolone may be used for Hodgkin's disease, non-Hodgkin's lymphoma, and B-cell lymphoma and leukaemia.

Dexamethasone is the corticosteroid of choice in paediatric supportive and palliative care. For children who are not receiving a corticosteroid as a component of their chemotherapy, dexamethasone may be used to reduce raised intracranial pressure, or to help control emesis when combined with an appropriate anti-emetic.

The corticosteroids are also powerful immunosuppressants. They are used to prevent organ transplant rejection, and in high dose to treat rejection episodes.