Treatment for Childhood Cancer

Fact Sheet for GPs

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Although childhood cancer is rare, it is important to maintain good communication between primary, secondary and tertiary care. Children with cancer have open access to hospital and the local team will always be glad to discuss specific issues with you.

Background

It has been estimated that around one child in every 500 will develop some form of cancer by 14 years of age in Great Britain. A dramatic improvement in prognosis means that now 78% of children with cancer will survive for five years or more, compared with just 28% in the late 1960s. Improvements in survival rates have been attributed to advances in treatment and supportive care, centralising treatment to specialist centres and inclusion of patients in clinical trials [1,2].

The spectrum of cancer in children differs markedly from that in adults. The three most common types of cancer diagnosed in children are leukaemias, brain and CNS tumours and lymphomas collectively accounting for around two-thirds of all cancers diagnosed in 0-14 year olds [3]. The remaining cancers diagnosed in children are embryonal tumours such as Wilms tumour, bone cancers and soft tissue sarcomas. Carcinomas and melanomas are very rare in children. Childhood cancer may present initially with symptoms and signs associated with common conditions. Further information on diagnosis may be found in the NICE Referral guidelines for suspected cancer [4]. Surgery, chemotherapy and radiotherapy remain the three basic therapeutic modalities for treating cancer. High-dose chemotherapy or total body irradiation may be indicated for certain poor-risk patients, accompanied by autologous (from oneself) or allogeneic (from a histocompatible donor) haematopoietic stem cell transplant (HSCT). Children may be referred to a transplant centre for such treatments.

Problems during treatment

1. Bone marrow suppression

- **Neutropenia**

  Children receiving chemotherapy are at greater risk of infection

  Neutropenia usually occurs 7-10 days after intensive block of treatment

  If neutropenic and febrile, children will be started on iv broad spectrum antibiotics empirically

  Paracetamol not recommended to reduce fever at home

- **Anaemia and Thrombocytopenia**

  Blood and platelet transfusions are often required when levels fall or if the child becomes symptomatic. Thresholds for transfusion vary depending on underlying diagnosis and whether receiving radiotherapy.

2. Gastrointestinal effects

- Mouth ulcers and oral thrush are common and good mouthcare is essential
- Antiseptic mouth washes are often recommended and oral antifungals are prescribed during neutropenic phases
- Dental work should be done when the blood count is normal
- Anti-emetics are routinely prescribed during intenstive treatment courses
- Early dietician involvement is recommended as some children require nasogastric feeds or parenteral nutrition

3. Alopecia

- Many cytotoxic drugs and cranial irradiation cause alopecia
- Usually reversible on stopping treatment
- Children with leukaemia regrow their hair during maintenance therapy
- Children are offered wigs before their hair falls out, but many prefer a hat or headscarf

4. Central venous access

- Central venous catheters or other implantable vascular access devices are routinely used for children receiving intensive therapy
- Parents or Community Nurses flush these regularly at home with heparinised saline
- Lines can become blocked or infected, and occasionally need replacement

5. Education

- Children will inevitably miss school during intensive therapy but are encouraged to attend when well, even on a part-time basis
- Children may attend the hospital school and/or home tuition can be arranged
- Some children, returning to school after brain tumour treatment, for example, may require a Statement of Special Educational Needs

6. Viral infections

- Measles and chicken pox can be fatal in immunosuppressed children
- Children who have a significant chickenpox contact will require rechecking of serostatus at time of exposure and will receive passive immunisation if seronegative
- Children who have a significant measles contact receive passive immunisation regardless of antibody status
- Immediate admission for treatment is advised if measles or chickenpox or shingles is suspected clinically
- Other common viral infections rarely cause problems, except in the post bone marrow transplant setting

7. Vaccinations

- All live vaccines must be avoided in children actively receiving treatment and up to 6 months after cessation of treatment
- Non-live vaccinations may be considered during treatment but response is often poor and they are best delayed until 6 months after treatment has been completed
- Influenza vaccine is recommended annually in autumn for all children receiving chemotherapy and up to 6 months after completion of treatment
- At 6 months after completion of standard chemotherapy treatment, all children, regardless of previous vaccination status, are recommended to receive booster vaccines
- Children who have had a matched sibling allogeneic HSCT or autologous HSCT should receive a re-vaccination programme at 12 months post- HSCT
- Children who have had any other allogeneic HSCT should receive a re-vaccination programme at 18 months post-HSCT
- Further details on the recommended re-vaccination programme can be obtained from your local hospital
- Siblings of the child with cancer should be fully immunised in order to minimise the risk of infecting the patient with the natural disease. There is no risk of vaccine strain spread
- Seronegative family members may receive varicella vaccine to provide indirect protection for susceptible patients during treatment [5]

Late effects of treatment

The risks of late effects are directly related to the treatment received:

Radiotherapy

- Depending on the field of radiotherapy, late effects may include: secondary malignancy, hypothalamic/pituitary dysfunction, reduced bone mineral density, gonadal dysfunction, and cardiac or respiratory dysfunction.

Chemotherapy

- Many cytotoxic drugs have cumulative toxicity, e.g. anthracyclines and cardiac dysfunction or cisplatin and renal dysfunction
- Patients are monitored carefully during treatment and dose modifications usually prevent clinically important organ damage.
- Potential late adverse effects depend on specific drug received but may include secondary leukaemia, gonadal dysfunction and auditory dysfunction.

Surgery

- Potential late effects will depend on the site of surgery
- Intracranial surgery may lead to potential neuropsychological dysfunction, hypothalamic/pituitary dysfunction or motor/sensory dysfunction
- Bone surgery may lead to deformity, scoliosis or asymmetrical growth
- Nephrectomy may cause long-term renal dysfunction and hypertension

Specific late effects

1. Quality of life

- Some survivors of childhood cancer may experience impaired quality of life
- This may include relationship difficulties, anxiety and depression, poor work performance and sexual dysfunction
- Some may experience difficulties obtaining employment in certain fields (especially the Armed Forces) or life insurance
- The CCLG has produced a useful booklet for such patients (see www.aftercure.org)

2. Gonadal dysfunction

- Fertility may be affected and if this is likely, this will be discussed early in treatment
- Survivors with poor growth, delayed pubertal development and risk of hypogonadism are referred to an endocrinologist
- If endocrine function is impaired, replacement therapy will be prescribed to induce puberty and maintain secondary sexual characteristics
- Cryopreservation of semen before cytotoxic treatment is considered for young male patients, where appropriate
- There is no evidence of an increased risk of congenital anomalies in the offspring of childhood cancer survivors

3. Secondary malignancy

- Patients are educated regarding the risk of secondary malignancy and reduction of risk behaviour, especially smoking and sunbathing
- It is important to encourage prompt reporting of new symptoms or masses

Palliative care

Sadly a few children die in remission due to complications of their cancer therapy. Most deaths however, are due to recurrent or uncontrollable disease. When it is clear that the child cannot be cured, a definite decision is usually made with the family to discontinue active treatment and to change to palliative care.

Most parents want their child to die at home and with adequate support this is usually possible. The period of terminal care is often short, sometimes as little as a week or two for children with leukaemia, although maybe several months for those with solid tumours. A network of Paediatric Oncology Outreach Nurses liaise with the General Practitioner during this time.

References:

1. Stiller, C. ed., 2007. *Childhood Cancer in Britain: Incidence, survival, mortality.* Oxford: Oxford University Press.
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3. National Registry of Childhood Tumours, 2010. *Childhood Cancer Research Group.*
4. NICE, 2005. *Referral guidelines for suspected cancer.*
5. RCPCH, 2002. *Immunisation of the immunocompromised child: Best Practice statement.* London: RCPCH.
6. Skinner, R., Wallace W.H.B., and Levitt, G.A. eds. 2005. T*herapy based long term follow up: Practice Statement*, Leicester: UKCCSG Late Effects Group.

LOCAL INFORMATION

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