

26-05-2014

Diego Ottaviani

Elective at the Rady's Children Hospital (San Diego, USA)

***Learning objective 1:** Describe the pattern of diseases of interest in the population with which you will be working and discuss this in the context of global health*

I have been working with children affected by a diverse range of haematological malignancies and solid tumours. In the USA the incidence of these diseases, which collectively are the second commonest cause of death in children, is about 137 per million children aged 0-14. The leukaemias are the most common type of paediatric malignancies and account for approximately 25% of childhood cancers. These are followed by the malignancies of the central nervous system, neuroblastomas, Non-Hodgkin lymphoma and Wilms tumour.

About 80% of the children and adolescents diagnosed with cancer each year live in countries with limited resources also known as low middle income countries (LMICs) while 20% live in high income countries (HICs). In HICs, the collective 5-year survival for all paediatric cancers has increased from less than 50% before 1970s to more than 80% in 2010. In LMICs such as Sub-Saharan Africa 5-year survival is less than 25%. Not much is known about the epidemiology of paediatric cancers in LMICs mainly due to the absence of cancer registries as well as under diagnosis. Compared to HICs such as the US, LMICs need to improve different aspects of their cancer programme including early diagnosis, public awareness, early referrals and treatment guidelines.

I have also worked with patients with haemoglobinopathies including sickle cell disease. In the US the estimated prevalence of all types of sickle cell disease for the African-American population is about 1:365 while for the Hispanic population is about 1:16305. In California the incidence for the HbSS form of sickle cell disease is 8.5 per 100,000.

The HbS allele is most frequent in Africa, the Middle East, India and limited areas of Mediterranean countries. In LMICs such as Uganda sickle cell disease may contribute to up to 15% of the under-5 mortality rate. In HICs universal newborn screening programmes allow early interventions such penicillin prophylaxis and pneumococcal immunisation as well as education regarding the complications of the disease. With these approaches more than 95% of children survive into adulthood.

***Learning objective 2:** Describe the pattern of health provision in relation to the country in which you will be working and contrast this with other countries or with the UK*

In the US there is no universal health care which is guaranteed by the government. While the government has a limited role on the health care of the population, private parties are encouraged to be responsible for it. Employers are the largest contributors

of health insurance. Government-sponsored health care programmes include Medicare and Medicaid. In the US, health care spending as a share of GDP is about 16% while public spending is approximately 45%.

In the UK there is a fully comprehensive national health system (NHS), which is funded through general taxation. Health care spending as a share of GDP is about 9% while public spending is approximately 82%.

Advantages of the American health care system over the UK include shorter waiting time for care, better access to technologies including MRI and better survival rates for common cancers. Disadvantages include the great cost of health-care in the US as well as quality of care, which is not significantly superior to other industrialised countries.

Learning objective 3: Paediatric haematology/oncology specific objectives

During this rotation I have improved my understanding of the following:

1) Haemoglobinopathies: I have learnt about sickle cell disease. I particularly focussed on the complications of the disease and its management.

2) Leukaemias: I have increased my understanding of different types of leukaemias especially precursor B-cell leukaemias. Specifically I have learnt about the epidemiology of the disease, common symptoms and signs, indicated investigations and treatments. I have reviewed the literature on relapsed acute lymphoblastic leukaemia focussing on the current and future treatment.

3) Solid tumours: I have learnt about the presentation, diagnosis and management of bone cancers including osteosarcoma.

4) Brain tumours: I have consolidated my knowledge of the most common brain tumours including gliomas, medulloblastomas and ependynomas. I reviewed their classification, clinical manifestations including “red flags”, diagnosis, treatment and long-term management.

5) Chemotherapy: I have learnt about the complex chemotherapy regimens of different malignancies including acute lymphoblastic leukaemia, chronic myelogenous leukaemias and Hodgkin's lymphomas. I have consolidated my knowledge on common chemotherapeutic agents including methotrexate, vincristine, dexamethasone, and asparaginase. I have reviewed the mode of action of the more novel chemotherapeutic agents including vorinostat, decitabine, alemtuzumab and rituximab. I have understood the common side effects of chemotherapeutic agents including mucositis, alopecia, nausea, peripheral neuropathy, myelosuppression, infertility, osteopenia and secondary malignancy.

6) Clinical trials: I have learnt about the different phases of clinical trials. I studied them in the context of haematology and oncology. I have critically evaluated scientific manuscripts about phase 2 and 3 clinical trials of several novel molecular targeted agents. I have learnt about clinical trials at the clinical trial monthly

meetings.

7) Bone Marrow Transplant: I have learnt about the conditioning stage, the day of the transplant and the events following the day of the transplant. I reviewed the complications of bone marrow transplantation including graft versus host disease and graft failure as well as their clinical manifestations. I have learnt about the management of potential complications including the use of agents such as cyclosporin and methotrexate

Learning objective 4: Describe your activities and experiences

During my placement at the Rady's Children Hospital I attended daily ward rounds in the inpatient Haematology and Oncology unit. I followed up several patients and presented them to my supervising attending. I have clerked several patients in the inpatient unit and learnt more about the common signs and symptoms, diagnosis and management of different haematological and oncological conditions.

I have evaluated patients in a variety of outpatients clinics including long term follow up after cancer treatment, haemophilia and brain tumour clinics and observed practical procedures including lumbar punctures. I participated to weekly multidisciplinary team meetings where complex cases were discussed amongst surgeons, haematologists, radiologists and pathologists.

I attended several teaching conferences in which diagnosis, treatment choices, education and prognosis were discussed with the patients and/or their parents. This was an extremely valuable learning opportunity as it gave the chance to see different ways of breaking bad news, discussing complex side effects of treatment and overall to appreciate the importance of effective communication in challenging circumstances.

About three times a week I attended a teaching session on a variety of haematological and oncological topics. These sessions gave me useful background information, which improved my understanding of oncologic emergencies and more in general of the principles governing the management of haematological and oncological patients. Each day I attended the resident conference, which was on general paediatric topics. I found these sessions useful as they were often on common conditions, which I am likely to encounter as a foundation year doctor. I improved my ability to evaluate haematological diseases by attending weekly pathology meetings where peripheral blood films were analysed and interpreted with the pathologist attending.

At the end of my clerkship I prepared a presentation on the current and future treatment of relapsed acute lymphoblastic leukaemia. I presented this topic to the residents and attendings of my unit. Overall this has been a great experience since I had the opportunity to learn from talented consultants within a well-funded hospital. For my career this clerkship has been valuable as it has strengthened my interest in haematology.