Clinical Topics

Growth of clinical haematology in South Tees Health District 1983-5

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Abstract

A review of the workload of two newly appointed clinical haematologists in a health district with a population of 307 000 showed that the clinical case load increased rapidly in the first two years. The management of patients with blood disorders, which had previously been dispersed among many departments both within and outside the district, was now concentrated within a single unit with occasional referral as appropriate to regional centres.

The development of a clinical haematology service in district general hospitals cannot occur without funding and facilities, including suitably located beds for haematology patients and specifically appointed junior medical staff. Highly trained and experienced nursing staff are essential for the management of patients with bone marrow failure; day care facilities and community nursing are also valuable. Changes and developments in the laboratory as a result of these additional clinical activities are also necessary.

Introduction

Most health districts in the United Kingdom now have at least one consultant trained in both laboratory and clinical aspects of haematology.[1] The opportunity to chart the development of a clinical haematology service in a district general hospital from its inception is therefore rare. Nevertheless, we have had such an opportunity in the past two years since we were appointed to a district that previously had no staff with a specialist training in clinical haematology except for an interest in childhood leukaemia.

Haematology has been transformed during the past two decades from a specialty that is exclusively laboratory based into one with an additional clinical element. Little has been published on current workloads in this continually expanding discipline. We decided to report our own experience in some detail, as more resources will clearly be required for clinical haematology in this and probably many other districts to develop and maintain a satisfactory service.

History

In 1982 the South Tees Health District decided to appoint a second haematologist to care for patients with blood disorders. Before this such patients were managed in various ways by several doctors. A brief review of the nine assessable adult patients (aged 53 to 78) diagnosed as having acute myeloid leukaemia in 1981-2, the two years before we were appointed, shows this well. These nine patients were cared for by five different consultants on five different wards with five different sets of junior medical and nursing staff. Thus no team attended more than four patients with acute myeloid leukaemia during the two years. Four different doctors used or proposed using chemotherapy to try and induce a remission, and only one of the four patients thus treated obtained a remission, one dying of sepsis and two of resistant leukaemia.

Just as patients with acute leukaemia were spread around the acute units in the district patients with myeloproliferative disorders, myeloma, and chronic leukaemias and lymphomas were similarly cared for by several different doctors, and some were under the care of radiotherapists. A few patients (particularly young adults with acute leukaemia or lymphoma) were referred to the haematology or radiotherapy departments at the nearest teaching hospital 45 miles away. The single handed specialist haematologist in post had no adult patients under her direct care but looked after children with leukaemia throughout Teesside.

During the discussions preceding the appointment of a second haematologist for the district several points were considered. Firstly, the clinical aspects of haematology had become increasingly complex over the past decade and required a degree of specialist experience and commitment that could no longer be adequately provided by the general physicians and radiotherapists of the district, whose time was already fully committed to developments in their own special interests. Secondly, it was recognised that the nature and depth of training of most present day senior registrars in haematology fitted them for the overall care of patients with serious blood disorders and that most applicants would expect to provide a clinical as well as a laboratory service. In addition, the idea of a clinical haematologist was no longer resisted within the district, a problem that remains in some districts. Thirdly, the greatest improvement in patient care seemed likely to result from the concentration of patients with serious haematological disorders into a single unit within which nursing, medical, and technical expertise would develop. This would apply especially to the management of patients who became pancytopenic during treatment for haematological malignancies.

One of us (GPS) succeeded a general pathologist and took up his appointment in September 1983 immediately after the resignation of the senior, laboratory based haematologist already in post. The process of filling this vacancy was protracted, and it was a year before the second of us (JEC) was able to take up his appointment.

Resources initially allocated to the adult clinical haematology service for the South Tees Health District (population served 307 000)[1] were one clinic session and access to six beds for the care of inpatients. The beds were evenly distributed between this hospital and Hemlington Hospital, five miles away. At Hemlington Hospital the allocation was three single rooms in the less than ideal surroundings of a ward for patients with infectious diseases. At this hospital, where the wards are adjacent to the main haematology and blood transfusion laboratories, we were able to use one or two single rooms and a flexible number of other beds on a general medical ward. No dedicated junior medical staff were provided to help develop the clinical haematology service, and we were grateful for the cooperation of the general physicians concerned for sharing often hard pressed junior staff and facilities.

At first there were no day care facilities and only very limited provision for seeing patients in the laboratory. An existing clinic for patients with childhood leukaemia was retained and expanded, in collaboration with one of the consultant paediatricians, into a haematology and oncology clinic

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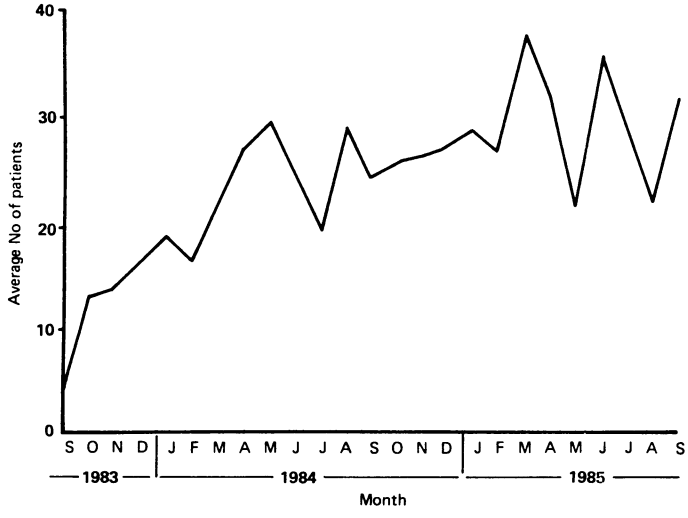
dealing with various blood disorders, including acute leukaemia and other malignancies from the Cleveland subregion (population 645 000).[3] Finally, a weekly anticoagulant clinic was already established at South Cleveland Hospital and is currently staffed by a senior house officer in general medicine. A clinical and laboratory consultant service is also provided for South Cleveland Hospital, the newest of three acute general hospitals in the district.

Clinical developments

The figure shows the average number of adult outpatients attending each clinic each month from September 1983 to September 1985. Numbers rapidly increased over the first nine months, reflecting the large pool of patients with blood disorders in the community that were now being concentrated into a single facility, and haematology soon acquired the largest number of patients per clinic of all the medical specialties at this hospital.



Average number of patients per clinic attending adult haematology outpatient clinic September 1983 to September 1985.

Clinics were conducted almost entirely without junior medical help. Pressure on the outpatient clinic, however, has recently been reduced by transferring patients requiring procedures such as bone marrow aspirations and biopsies, venesections, and limited chemotherapy to a day ward.

The number of adult haematology inpatients on each of the two hospital sites has varied from two to six, with a maximum of 12 patients at any one time. There are on average one or two inpatients receiving combination chemotherapy for acute leukaemia, and they are managed at this hospital, along with any other seriously ill patients, because of the proximity of the laboratory and our own offices. In addition, the highest number of paediatric inpatients with blood disorders has been four, but generally there are not more than one or two at any one time.

The additional haematology patients, on top of the routine and emergency work and the running of a coronary care unit, create an intensive workload for the nursing and junior medical staff. Nevertheless, we feel that the additional experience of looking after these potentially difficult cases is of considerable interest and value to general medical trainees working for membership of the Royal College of Physicians. The appointment of a senior house officer in clinical haematology as part of a general medical rotation would, however, allow a greater depth of training and experience, general medical experience being obtained by participation in an out of hours on call rota.

The importance of a stable, experienced group of qualified nurses for the management of these patients cannot be overemphasised. In addition, close liaison with community and terminal care nurses is a great advantage, and specific attachment of a Macmillan sister to the haematology unit is being considered. This would allow continuity of care between hospital and the home.

The table shows a selection of the total case load that has developed over two years (outpatients and inpatients). This table lists only patients directly under our care, but there have of course also been many patients under the care of other consultants referred for investigation. Of the 14 adult patients with acute myeloid leukaemia (including five with a pre-existing myelodysplastic syndrome) for whom intensive treatment was considered appropriate, 10 (71%) entered complete remission. The incidence of remission in patients without pre-existing myelodysplasia was 100%. Three of these later received successful allogeneic bone marrow transplants at the Royal Victoria Infirmary, Newcastle. Two patients first presented to us in relapse; in a further six patients with acute myeloid leukaemia aggressive treatment was thought to be unwarranted, and they were given low doses of cytosine arabinoside, other palliative treatment, or blood transfusion alone. Of these six, one (17%) achieved complete remission. One patient with chronic myeloid leukaemia has since received an allogeneic marrow transplant.

With recognition of the value of intensive treatment and its attendant risk of bone marrow failure more patients with Hodgkin's and non-Hodgkin's lymphoma have been referred to us for investigation and treatment. Those requiring combination chemotherapy have been managed largely as outpatients. We have cooperated with the subregional radiotherapy department in South Tees over cross referral of patients, but the two units being sited in different hospitals has so far precluded closer collaboration such as the establishment of a combined lymphoma clinic.

The largest single group of patients was those with chronic lymphocytic leukaemia, and they were generally managed conservatively with minimum outpatient attendance. Three were referred for low dose radiotherapy to the spleen. Of the 35 patients with idiopathic thrombocytopenic purpura, 12 underwent splenectomy, after which one subsequently relapsed. Patients with myeloma represented an appreciable workload both on the ward and in the outpatient clinic. Two patients presented with hyperviscosity requiring repeated plasmapharesis by membrane filtration at South Cleveland Hospital. The district does not at present possess a centrifugal cell separator that could provide fresh platelets and granulocytes from related donors as well as performing plasma exchange. Uncertainty about the value of such procedures except in patients with proved hyperviscosity, however, would make it difficult to justify the capital, running, and staff costs of such a service unless it were funded on a subregional basis.

South Tees has a relatively large number of patients with haemophilia. The care of patients with severe haemophilia A and B is still largely coordinated by the regional haemophilia centre at the Royal Victoria Infirmary, Newcastle, but all children and those adults with mild or moderate disease are seen at this hospital, receiving almost exclusively treatment with cryoprecipitate or desmopressin (DDAVP).

Other childhood problems included five new cases of paediatric acute lymphoblastic leukaemia, managed on the UKALL VIII and now the UKALL X regimens, as well as follow up of 12 other patients. In addition to the patients with leukaemia a 7 year old girl with severe aplastic anaemia responded to two courses of antithymocyte globulin and entered complete remission. Children presenting with solid tumours (two with non-Hodgkin's lymphoma and one with rhabdomyosarcoma) were managed in collaboration with a regional paediatric oncology centre.

Many haematology patients can be managed as day cases as they do not require admission but are difficult or impossible to manage during a conventional outpatient session. At first no day care facilities were assigned to haematology, but after negotiation a weekly session was made available in the gastrointestinal unit at this hospital. This session is used for practical procedures—for example, bone marrow aspirations and biopsies, venesection, and chemotherapy. The availability of this facility has relieved some of the pressure on the outpatient clinic and general medical ward and if expanded could further reduce the need for admission. For example, maintenance transfusions could often be given on a day patient basis if suitable facilities were provided.

As with other developments in clinical services the appointment of clinical haematologists is likely to have an appreciable effect on expenditure. This is mainly due to increased use of expensive cytotoxic drugs and intravenous broad spectrum antibiotics. Unfortunately, this aspect has not been

Main diagnoses of patients under direct care of clinical haematologists 1983-5

Diagnosis	No of patients	Diagnosis	No of patients
Chronic lymphocytic leukaemia	43	Hodgkin's disease	12
Idiopathic thrombocytopenic purpura	35	Waldenström's macroglobulinaemia	9
Myelodysplastic syndromes	30	Essential thrombocythaemia	8
Multiple myeloma	29	Neutropenia	8
Primary polycythaemia	25	Acute lymphoblastic leukaemia (adults)	7
Non-Hodgkin's lymphoma	24	Von Willebrand's disease	7
Acute myeloid leukaemia	22	Secondary polycythaemia	6
Haemolytic anaemias	17	Aplastic anaemia	5
Acute lymphoblastic leukaemia (children)	17	Myelofibrosis	3
Chronic myeloid leukaemia	13	Other anaemias	35
Haemophilia A and B	12		

documented as the pharmacy department of the hospital was not computerised at that time. Nor have we been able to provide formal proof of increased longevity or quality of life in our patients compared with previous years (though in the case of acute myeloid leukaemia referred to above our results have been clearly better). A full prospective cost benefit analysis of the introduction of such developments in services should ideally be conducted by health economists in selected districts to confirm that value for money is being obtained.

Laboratory developments

The growth of clinical haematology has naturally had implications for the laboratory, requiring extra work and reorganisation. One obvious example is the need to provide rapid and comprehensive results for the adult and paediatric outpatient clinics. Considerably more bone marrow aspirates have been performed, 575 being carried out in our first two years. Cytochemical tests (special stains) were performed in 40 cases, and 167 bone marrow trephines were carried out. Since more patients have been treated with intensive chemotherapy demand for blood and blood products has increased. Blood products include large quantities of platelet concentrates and also fresh frozen plasma and cryoprecipitate. In addition, the number and complexity of investigations of coagulation defects has increased, both in patients with haematological malignancies and in those with hereditary bleeding disorders.

Laboratory developments specifically to help cope with these extra demands have occurred. A microcomputer has been obtained and installed in the blood transfusion department to facilitate stock control, storage of patient data, generation of daily worksheets, antenatal serology, and production of statistical data on the use (and abuse) of blood and blood products. The purchase of a platelet agitator has allowed optimum storage of a larger stock of platelet concentrate for immediate use, as the routine transport of platelets from the regional centre at Newcastle takes several hours. An automated white cell differential counter has been installed in the electronic cell counter (Coulter S Plus 4) to reduce the number of manual white cell differentials performed in the haematology laboratory. This enables the existing staff to deal with an ever increasing workload for the district as a whole. In the coagulation laboratory the arrangements for platelet function tests have been rationalised, and measurement of factor VIII related antigen and antithrombin III has been introduced. A second automated coagulometer is to be purchased.

Outside the haematology laboratory one of us (GPS) has pursued an interest in the development of the immunology service. Changes relevant to clinical haematology have been the concentration of all immunoglobulin measurements in the immunology department and a large increase in the number of assays performed. In association with this, immunofluorescent examination of bone marrow and the assay of serum β_2 microglobulin have been established in this department. Leukaemia immunophenotyping with monoclonal antibodies has recently been introduced.

Other developments not strictly linked to the growth of clinical haematology have been the introduction of routine ferritin and intrinsic factor autoantibody radioimmunoassays performed in the clinical chemistry department. Future plans include computerisation of other sections of the laboratory to facilitate data handling, storage, and retrieval by a microcomputer network. Finance for this development was provisionally allocated for 1986-7.

The future

The most urgent need for the future is the amalgamation of the beds for adult haematology inpatients into a single hospital close to the laboratory. This will be achieved in 1987 after an old ward block at this hospital has been demolished and a new block with 60 surgical and 60 medical beds has been built, allowing the provision of six beds for haematology, of which at least four will be in single rooms. Flexible arrangements with our colleagues will allow the number of beds used to vary from nought to 10 or more, depending on demand. Plans to transfer the day ward facility to a specific purpose built room within the new medical ward to allow daily use as necessary will especially benefit the management of haemophiliacs.

The second most important requirement is the appointment of junior medical staff specifically for haematology. A senior house officer for the care of inpatients is required and would form part of a rotation with other specialties in general medicine. He or she, who would be training for membership of the Royal College of Physicians, would also help with day and outpatients and would be able to learn basic laboratory techniques. In addition, a registrar post is available in pathology, which hopefully will eventually rotate among the various pathological specialties, though a trainee registrar post leading on to the senior registrar grade in a university hospital would be far more satisfactory.

It is not yet clear whether bone marrow allografting and autografting will continue to expand to the extent that the single regional centre could no longer handle the demand. These techniques are relevant both to haematology and to oncology, and if a clear need for this development in districts or subregions is established appropriate funding would be required for nursing, medical, and laboratory staff.

Further decentralisation of haemophilia services may occur in the future. This would require more clinical time and expanded facilities in both the blood transfusion and coagulation laboratories. Special provision has been made for the safe handling of specimens from patients who may become positive for antibody to human immune deficiency virus (HIV) and for their clinical care.

The continued expansion of paediatric haematology and oncology will require more nurses on the paediatric wards and more training for all grades of medical staff. The expansion of this service locally is important because of the long travelling distances for patients from this district who have to attend either of the nearest regional centres. There should be full and mutual cooperation between this centre and a larger regional centre to ensure optimum management of these patients.

Conclusion

Little published information is available on the clinical workload in haematology, though the emergence of haematology as a clinical discipline is now recognised by both pathologists and physicians through the Joint Committee on Higher Medical Training.

The rapid expansion of clinical haematology in the South Tees Health District since 1983 shows the need for a service provided by district general hospitals. The establishment of such a service immediately creates, firstly, a need for more than one consultant haematologist,[4] which fortunately has already been fulfilled. Secondly, facilities for the care of haematology patients need to be sensibly located as close to the main laboratory as possible. This requirement should be satisfied in South Tees in 1987. Thirdly, the clinical workload justifies the appointment of junior staff specialising in haematology, most urgently for the care of inpatients but also to help in the outpatient department, with laboratory duties, and in research.

Prospects for clinical haematology in South Tees are bright, provided that adequate resources are made available in future to maintain a high quality of service to the continually increasing number of patients who can benefit from it.

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