Commentary

An agenda for UK clinical pharmacology

Developing and delivering clinical pharmacology in the UK National Health Service

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Clinical pharmacologists are active in the delivery of general and specialist medical services across the UK. They also make major contributions, both locally and nationally, to medicines management and appraisal in the National Health Service. Most are also heavily involved in the organization and delivery of teaching and training of a range of healthcare professionals, both undergraduates and postgraduates. In the past, these contributions may not have been fully recognized, perhaps in part because the discipline is small. However, the British Pharmacological Society, particularly through its Clinical Section, is committed to initiatives to ensure that all clinical pharmacologists (whatever their background, training or subsequent working environment) can work together to improve patient care, nationally and internationally. Effective engagement with universities, the National Health Service and pharmaceutical companies will be vital if these initiatives are to have sustained benefits and improve health outcomes for patients.

Introduction

Prescribing a medicine is one of the most effective and yet potentially dangerous things any healthcare professional will do. Clinical pharmacologists aim to optimize the efficacy of medicines and to minimize their adverse effects in patients, so as to improve health outcomes. They are educators, practising clinicians, purveyors of information, researchers and policy makers. Clinical pharmacology has a major part to play in the UK National Health Service (NHS).

In his 2006 review of 75 years of clinical pharmacology, Colin Dollery rhetorically asked what clinical pharmacology is, and offered three options: (i) a laboratory discipline dealing with biomarkers, pharmacokinetics, drug metabolism and genetics based on human samples; (ii) a desk discipline dealing with design and evaluation of clinical trials, drug utilization on a local and national level, clinical guidelines for drug use and pharmacovigilance; or (iii) a hands-on clinical discipline dealing with patient care, experimental medicine studies of old and new drugs, clinical investigation of adverse reactions and interactions, and consultancy services to other clinicians who have drug problems.

He concluded that clinical pharmacology is all of these things, although he pointed out that in medical schools and hospitals the exact answer makes a great deal of difference to where the specialty is located, its training and promotion routes, whether it requires medical training to do it and, critically, who pays for training and for the salaries of those who are trained [1].

What clinical pharmacologists do

A survey of senior UK clinical pharmacologists [2] has shown that they undertake a wide range of activities, including the following: teaching medical students and others the principles of clinical pharmacology and practical therapeutics; research in a wide range of pharmacological and therapeutic areas; patient care, mostly in acute and general hospital medicine and in outpatient clinics; service both locally and nationally on a wide range of committees related to drug therapy; and editorial work on learned journals and preparation of written teaching materials, including journal articles, didactic textbooks, reference books and e-learning materials. They spend a median of 50 h per week in these activities, distributed as follows: teaching,

Figure 1

National Health Service Information Centre, Hospital Episode Statistics for England. Top panel shows inpatient statistics. Bottom panel shows outpatient attendances for England

10%; research, 40%; clinical work, 30%; policy and administration, 12%; and editorial work and writing, 8%.

Although only about 25% of UK clinical pharmacologists outside of pharmaceutical companies and contract research organizations are employed by the NHS, the rest being employed by universities, most of the latter have NHS honorary contracts and much of what they do contributes directly to UK healthcare.

Contributions to general (internal) and acute medicine and other specialities

Walport has written that ‘the skills of clinical pharmacology are essential for the practice of the best medicine’ and that ‘clinical pharmacology is the purest form of general medicine’ [3]. Most clinical pharmacologists undertake extensive clinical duties in general (internal medicine). They are generalists in their approach to diagnosis and general management, but specialists in relation to the intricacies of prescribing and the recognition and management of iatrogenic disease. The extent to which they contribute is often not recognized, because their activities are subsumed

under the heading of medicine rather than clinical pharmacology. However, this contribution is being increasingly recognized (Figure 1) [4]. Clinical pharmacologists are in a strong position to link understanding of the pathophysiology of diseases that commonly cause emergency medical admissions with an awareness of the relevant evidence-based therapeutics of those conditions. We should continue to encourage the linkage between general (internal) medicine and clinical pharmacology training. However, acute medicine is the speciality that deals with the urgent or emergency management of patients who present to hospital, and has its foundations in general (internal) medicine. Adverse drug reactions contribute 6.5% of medical admissions, and patients who are affected may subsequently account for 4% of hospital bed capacity, a significant clinical and public health challenge [5]. Some clinical pharmacologists have already decided to take up posts in this important new speciality, and closer training links in future should be explored.

Finally, several clinical pharmacology centres, particularly Liverpool, have developed joint training with several specialities (for example, respiratory medicine, gastroenterology and oncology) and also with general practice. These posts can strengthen the roles and the profile of clinical

pharmacology and improve patient care; they should be encouraged and developed elsewhere.

Specialist clinical services

The many contributions made by clinical pharmacologists include specialist therapeutics in, for example, the management of hypertension, stroke and epilepsy, drug allergy advisory services and clinical toxicology services, including pharmacovigilance and the care of poisoned patients. Clinical pharmacologists largely lead and provide on-call consultants for the UK National Poisons Information Service (NPIS) centres. They also run the UK's five Yellow Card Centres in Birmingham, Edinburgh, Cardiff, Liverpool and Newcastle upon Tyne, promoting the spontaneous reporting of suspected adverse drug reactions via the Yellow Card Scheme to the Medicines and Healthcare products Regulatory Agency, which in turn feeds information into the World Health Organization's adverse drug reactions monitoring centre in Uppsala, Sweden. These centres publish newsletters, giving up-to-date information about adverse reactions and interactions to local prescribers, and organize and deliver educational initiatives to promote greater and more appropriate reporting. Clinical pharmacologists must share their expertise in these areas with each other, so that the delivery of these specialist services can be optimized nationally, built on a firm foundation of rational therapeutics.

Medicines management and appraisal

Clinical pharmacologists are highly active in local Medicines and Therapeutics Committees (previously called Drug and Therapeutics Committees) and, through those committees, in the development of hospital formularies and many other activities related to the use of the medicines. They collaborate in these activities with other specialists, general practitioners and pharmacists (including clinical pharmacists). Nationally, they play important roles or even lead the development and delivery of health technology appraisals and therapeutic guidance and guidelines, for example through the work of the National Institute for Health and Clinical Excellence, the Scottish Medicines Consortium and the All Wales Medicines Strategy Group; in the provision of high-quality information about medicines via the British National Formulary and the British National Formulary for Children; and in regulatory affairs, through the various committees of the Medicines and Healthcare products Regulatory Agency (for example, the British Pharmacopoeia Commission, the Commission on Human Medicines, the Herbal Medicines Advisory Committee and the Pharmacovigilance Expert Advisory Group) or, at a European level, through the European Medicines

Agency. As part of its 5 year agenda for clinical pharmacology, the British Pharmacological Society is committed to sharing the skills and expertise of those already involved in these activities with other clinical pharmacologists, so that clinical pharmacology can contribute even more strongly to the health of the nation.

Teaching and training

Clinical pharmacologists teach medical students the principles of their science and the elements of practical prescribing. There are emerging opportunities for clinical pharmacologists to work with other professionals who might prescribe (for example, pharmacists and nurses) to deliver interprofessional learning opportunities in therapeutics and prescribing. This is dealt with in more detail by Simon Maxwell in another article in this issue of *BJCP*. They also train junior hospital doctors and run courses in clinical pharmacology, therapeutics and experimental therapeutics, including postgraduate certificates and diplomas, MSc programmes and supervision of MD and PhD students. For example, the Cardiff distance-learning Diploma/MSc course in Therapeutics has trained more than 500 candidates from all over the world during the 18 years since it was launched, and the distance-learning Certificate/Diploma/MSc in Medical Toxicology has trained nearly 300 candidates over the 14 years since it was instituted and has helped to prepare individuals to address difficult toxicological problems [6]. Clinical pharmacologists have also delivered a Diploma in Therapeutics in Newcastle University for the last 20 years.

Conclusions

The contribution of clinical pharmacology to the care of patients is much greater than might have been anticipated, given the relatively small size of the discipline. Clinical pharmacologists working in the NHS (whether employed by the NHS or more often by the Higher Education Sector) provide clinical care in general medicine as well as in other specialties. They also deliver a wide range of specialist services not commonly provided by other specialists. They fill key roles in medicines management, appraisal, regulation, pharmacovigilance and clinical toxicology. Finally, they provide leadership in the development and delivery of education in clinical pharmacology and therapeutics for both undergraduates and postgraduates. The British Pharmacological Society has a 5 year strategy to ensure that the discipline has a maximal impact on clinically effective and cost-effective care of patients.

Competing Interests

P.A.R. is Course Director of the Cardiff University Diploma/MSc Programmes in Therapeutics and Medical Toxicology.

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