Symposium: Pediatric pharmacology

Editor: Neil Buchanan, Australia

Practical pediatric pharmacology in developing countries

Neil Buchanan

Pediatric Pharmacology Unit, Department of Pediatrics, Westmead Hospital, Westmead, Sydney, N.S.W. 2145, Australia.

Pediatric pharmacology is differently defined by a number of persons working in the area. In essence, however, it represents the study of medications used in childhood. Whilst this may sound rather trite, it leads on to an important facet of pediatric pharmacology, namely drug utilisation.

In the Asian context, is it known what drug utilisation patterns in childhood in fact are? Extrapolation from developed countries would suggest that they are very likely firstly, to be quite different from drug utilisation in adult practice and secondly, that children probably receive many less medications than do their adult counterparts. It is likely that the commonest medications used are anti-infective agents, antipyretics, anticonvulsants and bronchodilators. Naturally, large numbers of children would also be receiving vitamins, iron and oral electrolyte solutions, but perhaps these agents fall into a somewhat different category of therapeutic compounds.

Reprint requests: Prof. N. Buchanan

When talking of drug utilisation, which should be the crux for clinical pharmacology development, it is important not to be swayed by the prescribing habits in teaching hospitals, where children with complicated illnesses receive complicated medications. At a community level, most children have self limiting illnesses which are treated with relatively simple medication. It is at this level that drug utilisation studies should be performed, to ascertain what the childhood population in the community is taking. This form of study is quite easy to conduct and can quite often be combined with a compliance study, if that is necessary. Of course it is important to ascertain what goes on in hospitals, but this should be done separately and should be seen in a quite different light. Drug utilisation data is fundamental to pediatric pharmacology in terms of teaching, research and, of course, clinical practice.

Turning to undergraduate teaching, this should be based on drug utilisation information. There is little point in expending a great deal of time and energy on uncommonly used therapeutic agents.
Teaching should be practical and pragmatic, emphasising common therapeutic situations. There is a need for a basic understanding of pharmacokinetics, but it should be stressed that for the clinician, pharmacokinetics is a science that should produce information applicable at the bedside. Most students and clinicians find pharmacokinetics daunting, largely because it is presented as a rather abstract subject, complicated by models and mathematics, rather than as the scientific basis for rational drug usage. Undergraduate teaching should emphasise a number of important factors relating to drug therapy in childhood:

(a) neonatal pharmacology, with emphasis on altered drug distribution, renal and hepatic maturation, especially in the premature;

(b) the rapid hepatic metabolism of drugs, especially those hydroxylated, in older child;

(c) compliance problems in childhood. Much is written and said about this, but the reality is that between 50 per cent and 70 per cent of children are non-compliant for a course of medication for an acute illness. Does this really matter? Should we in fact be prescribing 10 day courses of antibiotics for tonsillitis, when we know that most patients only take the medication for 3 or 4 days.

(d) Emphasis should be placed on logical prescribing, especially for outpatients. Few medications need to be taken four times a day. Most are acceptable to the patient on a thrice daily basis, and many can be given twice daily. Only essential medications should be given and kept to a basic minimum.

(e) Side effects of drugs are little discussed at the bedside and parents are often very ill informed in this regard.

(f) Communication with parents and children. Whilst quite a lot of time is spent taking a history and examining the patient, the therapeutic aspect, namely writing the prescription, takes almost no time at all. The writing of the prescription symbolises to both patient and doctor that a decision has been made and the consultation has ended. There is no time to ask any questions.

Turning now to research. It could be suggested that in all situations, but especially in a developing country, pediatric pharmacology research should be based upon (a) drug utilisation patterns; this would necessitate updating such information every few years to ascertain changes in utilisation; thus there should be ongoing surveillance in this area; (b) prevailing clinical problems such as malnutrition, tuberculosis, neonatal infections, meningitis, liver disease, etc; (c) new, cost-effective drugs which become available from time to time.

From a practical point of view, research in this area can be subdivided into three somewhat arbitrary groups; clinical, clinico-laboratory and laboratory research. Whilst there is clearly a role for all three types of research, in terms of practicality, for developing countries, a strong emphasis on clinical and clinico-laboratory research is appropriate and desirable. This should not be seen as developing countries conducting inferior research, but rather doing well, what can most effectively be done with relatively limited resources and greater benefit.

Clinical research is a vital, and often neglected, area of pediatric pharmacology. Clinical observation alone can be of great use. Two simple examples come to mind: