Endocrinology in the 21st century

Policymakers need to catch up with the explosion of new tests and therapies

THE FIELD OF ENDOCRINOLOGY has expanded dramatically in the past 40 years, both because of increased knowledge about the aetiology, diagnosis and therapy of endocrine disease and because of the increasing number of patients with very common endocrine conditions, particularly type 2 diabetes, osteoporosis and menopausal problems.

The development of the radioimmunoassay for hormone measurement in the 1960s was a landmark in endocrinology, as it allowed measurement of hormone concentrations in small blood samples. Since the 1980s, hormone assays have become routine, automated and widespread, with most now readily available to general practice through commercial pathology laboratories. As random measurement of many hormones can give misleading results, it is important that those ordering assays understand their interpretation.

In Australia, ageing of the population and lifestyle change have caused an explosion of obesity, type 2 diabetes and osteoporosis. The AusDiab study in 2000 showed that 20% of the Australian population aged over 25 years was obese (body mass index > 30 kg/m^2) and, possibly of even greater concern, more than 30% of the population had central obesity, while 7.4% had diabetes, mostly type 2.[1] The problem of osteoporosis is also large, caused particularly by population ageing, but possibly also by reduced levels of physical activity, and has a massive impact on the healthcare system and budget. For example, the estimated cost of hip fracture in Australia is $7 billion per annum — $2 billion in direct and $5 billion in indirect costs.[2]

Endocrinology is at the forefront of evidence-based developments in therapy and primary and secondary prevention. It has been particularly affected by the rapid expansion and improvement of pharmacotherapy and the explosion of information from clinical trials and epidemiological studies on appropriate indications for drug use.

In diabetes, new treatments include human insulin analogues with more rapid or more prolonged action. There are newer and better long-acting sulfonylureas, as well as short-acting insulin secretagogues (the glitinides). Alpha-glucosidase inhibitors have been developed to inhibit carbohydrate absorption, and recently the thiazolidinediones ("glitazones" — which combat insulin resistance) have become widely used in most developed countries.

Therapy for obesity remains difficult, but better understanding of nutritional approaches, availability of new pharmacological agents (eg, orlistat and sibutramine), and more sophisticated surgical approaches are all important. Our understanding of the molecular mechanisms underlying weight control is improving through cloning of signalling molecules and their receptors.

For osteoporosis prevention and treatment, an increasing number of agents have proven efficacy. The selective oestrogen-receptor modulators (eg, raloxifene) have an oestrogen-like effect on bone but not uterus and breast. The newer bisphosphonates are highly effective in preventing decline in, or actually enhancing, bone mineral content by inhibiting bone resorption. Parathyroid hormone is the first drug to increase bone formation and can reduce fracture rates in some patient groups by up to 70%.[3]

These changes in disease prevalence and in therapy and prevention have raised important issues of health policy. The availability of diagnostic tests for common conditions can be an issue; for example, only four tests of glycosylated haemoglobin (HbA_{1c}) are reimbursable through Medicare per annum for people with diabetes. Of greater concern to physicians, government and the public is the availability and cost of new drugs. For example, thiazolidinediones are not yet available on the Pharmaceutical Benefits Scheme (PBS) over 2 years after the initial application. Nor is growth hormone replacement therapy for adult growth hormone deficiency accepted for PBS subsidy, while patients using corticosteroid therapy are not eligible for reimbursement for effective therapy to prevent bone loss (eg, bisphosphonates), unless they have reached an established diagnosis of osteoporosis with fracture. The availability of such new drugs for the accepted indications will probably pose an increasingly difficult problem as our healthcare system tries to balance restraint on expenditure with improved therapy for the individual.

This Practice Essentials series aims to review the most common areas of endocrinological practice, with special emphasis on clinical issues important in general practice. The articles are designed to enable general practitioners, general physicians and physicians in other specialties to remain up to date with the rapidly changing therapies in endocrinology, new diagnostic tests and their interpretations, as well as current issues in health policy and disease prevention.

Jeffrey D Zajac
Professor, Department of Medicine, University of Melbourne
Austin and Repatriation Medical Centre, Melbourne, VIC
j.zajac@unimelb.edu.au

Donald J Chisholm
Clinical Head, Diabetes and Obesity Research Program
Garvan Institute of Medical Research and Department of Endocrinology
St Vincent's Hospital, Sydney, NSW

Bronwyn Gaut
Coordinating Editor for *MJA* Practice Essentials: Endocrinology
The Medical Journal of Australia, Sydney, NSW

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