Book reviews

Type 2 Diabetes. Prediction and Prevention. G. A. Hitman, editor. Chichester: John Wiley and Sons. 1999. £80 ISBN 0 471 985595 3

Over 100 million persons worldwide are thought to be affected by type 2 diabetes mellitus and the number is expected to double in the next 10 years. This disease, already one of the most common chronic conditions in Western society, is increasing in prevalence in most countries. This trend is particularly evident in developing countries where historically the prevalence of diabetes has been low. The medical, social and economic costs of diabetes are enormous. Persons with diabetes are at high risk for atherosclerosis, blindness, end-stage renal disease and lower-limb amputations. Clearly, we face a global epidemic that, if not checked, will have a substantial impact on the health of, and the cost of medical care in virtually every segment of society.

Type 2 Diabetes, Prediction and Prevention, a compact multi-authored text edited by Graham A. Hitman, directly targets this problem. Its twenty-one chapters provide a comprehensive and current overview of the epidemiology, pathogenesis, genetic and non-genetic determinants and primary prevention of type 2 diabetes. Type 1 diabetes, a less common condition by far, is not considered, nor are secondary prevention issues in diabetes, for example preventing microvascular complications through improved glycaemic control. A distinguished collection of authors, most of whom are at the forefront in their field, have contributed to this work. In general, the chapters are well written, clear and concise. In addition, there are ample references to further direct the reader.

The first section includes a balanced and up-to-date overview of pathogenesis of type 2 diabetes and a more general discussion of the epidemiology and diagnosis of diabetes. These chapters provide a broad introduction to the problem of diabetes and will serve as a useful review even for those who deal with the disease on a regular basis.

The second section is devoted to consideration of the important and rapidly developing area of the genetics of type 2 diabetes. There is strong evidence, reviewed in the first chapter of this section, that type 2 diabetes has a substantial genetic basis. However, in most cases the inheritance does not follow a typical Mendelian pattern. Rapid advances in the field of molecular genetics in the last few years have only recently allowed complex genetic diseases such as diabetes to be studied. The approach to understanding the genetics of diabetes that has been followed by most laboratories is reviewed in the second chapter. Insulin resistance is present in the great majority of persons with type 2 diabetes, but also precedes and predicts the development of the disease. As with diabetes, there is strong evidence that insulin resistance is a heritable trait. In the third chapter of this section this evidence is reviewed, as is the progress to date in finding genes contributing to insulin resistance. Defects in insulin secretion also contribute to the development of type 2 diabetes and, like insulin resistance, appear to be a heritable trait. The identification of at least five different genes causing maturity onset diabetes of the young, a relatively rare autosomal dominant form of diabetes which typically results in abnormalities in insulin secretion, are detailed in the following chapter. The identification of these genes is among the most compelling success stories of modern molecular genetics as it applies to diabetes and discussion of these genes provides a useful a model for understanding more typical forms of type 2 diabetes. In the final chapter in this section, the application of animal models to the study of genetics of type 2 diabetes is reviewed. In general, the review of the genetics of type 2 diabetes in this section is comprehensive and up to date. It is also presented in a way that should not intimidate the non-geneticist. Disappointingly, the evidence that insulin secretory dysfunction contributes to the development of garden-variety type 2 diabetes and is a heritable trait is not reviewed in great detail.

In addition to genetic determinants, environmental factors strongly influence the development of type 2 diabetes. A wealth of data has accumulated in recent years suggesting that the intrauterine environment is an important determinant of subsequent risk for type 2 diabetes. In particular, low birth weight, reflecting in some cases maternal–fetal protein malnutrition, and maternal hyperglycaemia increase the risk to the offspring of developing diabetes as an adult. These data are thoroughly reviewed in the first three chapters of this section. Obesity, although arguably a genetically determined risk factor in its own right, is one of the most important predictors of developing type 2 diabetes. The evidence linking obesity and diabetes is discussed in the final chapter of this section.

Having set the stage by reviewing the genetic and non-genetic basis of type 2 diabetes, the book turns, in its fourth part, to the primary prevention of the disease. Beginning with a general chapter on the prevention of non-communicable diseases, screening and prevention strategies are considered in detail. The contributions of diet and exercise to the primary prevention of diabetes and the efficacy of interventions in high-risk groups are reviewed in the following two chapters. Because lifestyle and behavioural changes are notoriously difficult to maintain long term, prevention trials are increasingly including a drug treatment arm. The results of early primary prevention trials using drugs, as well as the pharmacological basis for ongoing trials, are reviewed in the following chapter. Considering the evidence that diabetes is heritable and that relatives of persons with type 2 diabetes already manifest many abnormalities, including obesity and insulin resistance, that predispose them to diabetes, a case is made in the last chapter of this section for targeting this high-risk group for primary prevention efforts.

In the final section, future developments that may have an impact on the primary prevention of type 2 diabetes are considered. Of particular relevance, the growing problem of

diabetes in developing countries and migrant populations is addressed in the first chapter. The great majority of new cases of diabetes in the next 10 years are projected to occur in these groups. Thus, it is particularly important to consider how to prevent diabetes in these populations.

Considering the epidemiological data pointing to large increases in type 2 diabetes in the next decade and the rapid advances that have been made in understanding the genetic basis and pathogenesis of type 2 diabetes in the past decade, a comprehensive review of the potential for preventing diabetes is indeed timely. The editor has assembled an outstanding roster of contributors and has integrated diverse topics such as the molecular genetics and primary prevention of diabetes in a concise, readable whole which I highly recommend for readers with an interest in the area. For clinicians and others who care for persons with diabetes or who are at risk for diabetes, this book provides an up-to-date review. In addition, it will serve as a valuable resource for anyone planning or implementing primary prevention programmes. Because of the importance of nutrition and obesity in the development of diabetes and because of the broad scope of this book, it will be of particular interest to readers of the *British Journal of Nutrition.*

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Regulation of Feed Intake. D. van der Heide, E. A. Huisman, E. Kanis, J. W. M. Osse and M. W. A. Verstegen (editors). Wallingford: CABI *Publishing*. 1999. Pp. 232. £45 ISBN 0 85199 361 3

This book stems from the 5th Zodiac Symposium on the Regulation of Feed Intake, held in April 1998 in Wageningen, The Netherlands. My understanding is that both invited and original communications were presented at the Symposium, and that most of the presentations have resulted in chapters of this book. At first glance, it is rather difficult to distinguish which chapter falls into which category, and it is very hard to find a rationale for the order of the presentation of the chapters. As the book is divided into three broad parts, my expectation would have been that the review (invited) papers) should set the tone and that the original communications follow them in each relevant part. However, this is not the case and as a result I found the structure of the book unsympathetic to the reader.

There are six review chapters that have resulted from the invited presentations, and nineteen from original communications. The latter are each, on average, three to four pages long and my expectation is therefore that most of them will appear in the future as fully refereed papers. For this reason I do not intend to review them individually. My general comment on them is that the vast majority deal with the regulation of food intake in ruminant animals. This to me is a clear reflection of the importance of the topic and the fact that many issues associated with it and its prediction are still unresolved in relation to these animals.

The existence of only six review chapters makes this book rather lightweight. This is not a reflection on the quality of these chapters, but of the rather narrow range they cover. Chapter 1 by Forbes, 'Natural Feeding Behaviour and Feed Selection' is a general introduction to the subject that sets out very nicely the scene for the chapters that follow. Chapter 4 by Steffens and Benthem is a very comprehensive qualitative review entitled 'Central Nervous Control of Nutrient Availability and Utilisation'. As most, if not all, of the information presented in it derives from animals that are in a steady state (i.e. rats), I would expect it to be of less relevance to readers interested in animals that are in a dynamic state (farm animals). A significant omission from this chapter is the lack of any attempt at synthesis or consideration of how the reported findings move us towards a quantitative framework of food intake regulation. I particularly enjoyed Chapter 10 by Luiting, 'Role of Genetic Variation in Feed Intake'. It is a very clear demonstration of the need to consider food intake in a multidisciplinary fashion. Animal physiologists tend to ignore the fact that feed intake is a reflection of the animal's genotype, and hence subject to genetic variation. I strongly urge anyone who is even remotely interested in the general field of feed intake regulation to read it. Chapters 11 and 18 deal with the regulation of food intake in ruminants and they are both very successful demonstrations of our current failure to account adequately for such animals' feed intake. Chapter 11 by Faverdin and Bareille concentrates on the food intake of ruminants on high quality foods. My only minor criticism of this otherwise excellent chapter is that it is, like Chapter 4, rather qualitative. Chapter 18 by Tolkamp is a justifiably strong criticism of the existing theories of food intake in ruminants and why they have failed us. I consider the criticism very valuable, but I would like to have seen stronger suggestions of how to move forward in this chapter. The last review is the one by Schlect *et al*. (Chapter 19) 'Influence of the Environment on the Feed Intake of Cattle'. This is perhaps the weakest of the review chapters, since it is really too general to be useful.

The preface of the book states that information from studies on man, wild birds and fish is also presented in it alongside that from farm animals. I have found very little evidence in the book to support the claim. The book focuses on farm animals and ruminants in particular, and as a result it will be of relevance to those who are interested in these species. There is no real attempt to present a comparative approach to food intake regulations, and I consider this as a missed opportunity. As mentioned earlier, this book is a little too lightweight to justify its price, and as conference proceedings it certainly does not merit a hardback edition. Its major contribution lies in the identification of shortcomings in our understanding of the regulation of food intake, rather than representing a way forward.

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