BOOK REVIEW


This small book of less than 200 pages has a tantalising title that, if it was to succeed in covering and addressing the complex issues indicated in the title, would be a useful book to have in any occupational physician's library. The aim of the book is to highlight the profound implications, from an occupational health perspective, of how cells transform to become malignant. The technologies involved are traced in the context of the late Dr Irving J Selikoff's passion and vision for the prevention and treatment of occupational cancers.

The style of the book is a collection of original papers and commentary by Selikoff, together with a series of articles by an international spectrum of leading experts, exploring the changing nature of occupational and environmental oncology. Specific agents and methods, including the possible role of viruses and genetic testing, are reviewed in an attempt to provide not only scientific opportunities, but also to highlight some of the ethical choices and challenges posed by such developments. The book wishes to emphasise that the emergence of molecular biology in routine risk assessment and management increases the urgency of the need for practitioners in occupational health to understand the new realities of such research and practise.

The editors wished to target the book to a broad range of occupational health practitioners concerned with how ethical and scientific values interact and how such values may become positive factors in and outside the laboratory and in occupational health settings.

The book's content is divided into two main sections with the first few pages being dedicated to Selikoff's vision of preventative strategies and treatment for workers in the US and developing a theme in terms of the third epidemiological revolution resulting in a close collaboration between epidemiologists and molecular biologists. Known for his work with occupational exposure to asbestos and related diseases, his agenda in the latter part of his life revolved around the issues surrounding the workplace in relation to the human genome project and the molecular origins of cancer; both areas being the subject matter of his last two conferences.

The book does not represent the proceedings of those meetings. Rather it is both the history of the meetings and a selection of original papers on scientific and ethical issues. Also published in the book for the first time are Selikoff's own notes, edited as a paper, on the principles and opportunities now available for intervention in individuals at high risk of occupational cancer. These initial chapters make engaging reading, albeit with an American bias. Having been involved with studies on genetic markers since the late 1970s, I was uncertain whether I shared the enthusiasm that such research methods on genetic markers would significantly unravel the mechanistic and risk issues in relation to occupational carcinogenesis.

The first series of chapters are dedicated to the ethical, legal and social constraints with respect to the human genome project, with contributions from eminent authors in relation to human rights, genetic testing and the benefits of, and problems that can accrue, in such research and screening. Chapter 4 is particularly pragmatic in that it develops a theme outlining the 'dark side' of scientific progress in the light of such research on discovering the origins of cancer.

Whilst the first 5 chapters relate more to US employment law and practise, there are fundamental principles of confidentiality, participation, study design, implementation, interpretation and communication of results in occupational studies in these areas which are specific and I could relate to during the genetic endpoint studies I was involved in during the late 1970s.

The second part of the book, in my view, is a chef-d'oeuvre in terms of subject area and is a clear, balanced and up-to-date authoritative view by the authors. For a fastrack area such as this, the topics are clearly explained, without requiring an in-depth knowledge of the field, with a good selection of relevant references. The chapters review some of the mechanistic theories behind cancer initiation and promotion, with specific references to occupational cancers, and critically reviewing some of the international collaboration that has occurred over the last few years in monitoring populations exposed to carcinogenic substances by specific genetic endpoints.

I have been sceptical as to the importance and significance placed on these populations studies and I was relieved to see a cautious and balanced view regarding these in the chapter on 'Molecular Epidemiologic Contributions to Intervention'. This chapter emphasised that, despite a large volume of cross-sectional studies of increased frequency in some of the genetic endpoints in chemically exposed individuals, there is little evidence of the predictive value of these changes for cancer. The original vision that some of these genetic endpoints would be predictive has not been realised, as those involved in this area of research had expected that understanding changes at the genetic and molecular level would profoundly affect the strategies for intervention for high risk workers. Critical to the formation of such strategies is the ability to depict relevant events between exposure and the clinical occurrence of cancer. This part of the book refers...
specifically to research in relation to exposure to ethylene oxide, styrene, aromatic amines, formaldehyde and beryllium. Whilst there has been much research, the authors of the chapter 'Molecular Epidemiological Contributions to Intervention for Chemically Exposed Workers' concluded that a review of the molecular epidemiology of the substances and cancers examined revealed, for most, gaps between markers of biological effective dose, or early biological effects, and frank disease. There seems to be practically no studies that link these areas in the continuum. The important question in this field of research has not changed in my view, and is echoed in the book, that is 'what is the possibility of cancer occurring given the presence of the genetic markers under investigation?'

The chapter on 'Genetic Factors in Human Cancer' is a refreshingly clear and digestible account of the hereditary and environmental factors in carcinogenesis and I liked the concept of 'oncodemes' as a way of classifying the classes of cancer patient by causative factors.

The chapter on 'The Retinoblastoma Gene Family' and related proteins as negative regulators of cellular proliferation, is the clearest account I have seen on this subject.

Finally, the chapter on the 'Cellular and Molecular Mechanisms of the Asbestos-Related Disease' and the 'Expression of Tumour Suppressor Genes in Malignant Mesothelioma' are excellent and precede the final, and perhaps the most thought provoking, chapter on the role of the SV40 virus in the increased incidence of human mesothelioma and brain tumours over the past 20 years. Given the potential exposure to the SV40 virus, the aggressive nature and dismal prognosis of these tumours and their association with occupational groups, it will be interesting to follow this area of research in the future.

Most occupational physicians would find many of the chapters in this book interesting reading and it should be on the bookshelf of all those who have an interest in occupational cancers. The authors have avoided esoteric areas, which is all too common in this field. Selikoff's agenda was such that he took on faith the ability of medical science to convert discoveries made in the basic biomedical sciences into new opportunities for practical intervention during the latency period of occupational cancers. His views were, and are, not universally accepted and the book in a balanced and sensitive way addresses the issues and difficulties in this complex area.

The book ends with one of the editors recalling an incident when Selikoff was with a patient and not examining paradigms in occupational carcinogenesis. His question to the patient was 'tell me, when did you begin working in your trade ... what kind of work do you do ... what did you do before you became a millwright...do you remember when you started to cough ... did you see a doctor?' The third epidemiological revolution may still have a place for the clinician! at least for the foreseeable future.

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