JAPANESE CANCER ASSOCIATION
GANN Monograph on Cancer Research No.32

CANCER IN ATOMIC BOMB SURVIVORS

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JAPAN SCIENTIFIC SOCIETIES PRESS, Tokyo
PLENUM PRESS, New York and London

GANN Monograph on Cancer Research

The "GANN Monograph on Cancer Research" series is promoted by the Japanese Cancer Association. This semiannual series of monographs was initiated in 1966 by the late Dr. Tomizo Yoshida (1903–1973) and is now published jointly by Japan Scientific Societies Press, Tokyo and Plenum Press, New York and London. Each volume consists of collected contributions on current topics in cancer problems and allied research fields. The publication of these monographs owes much to the financial support given by the late Professor Kazushige Higuchi, the Jikei University School of Medicine.

The planning for each volume is done by the Board of Executive Directors of the Japanese Cancer Association, with the final approval of the Board of Directors. It is hoped that the series will serve as an important source of information in the field of cancer research.

Japanese Cancer Association

August 1986

Published jointly by
Japan Scientific Societies Press
2-10 Hongo, 6-chome, Bunkyo-ku, Tokyo 113, Japan
ISBN 4-7622-9490-X
and
Plenum Press
233 Spring Street, New York, NY 10013, USA
ISBN 0-306-42501-7

Distributed in all areas outside Japan and Asia between Pakistan and Korea by Plenum Press, New York and London.

Printed in Japan

PREFACE

Follow-up studies of persons exposed to medical radiation have long shown that radiation induces cancer in man. This, coupled with increasing exposure from other sources including occupational and environmental radiations, has resulted in greater recognition of the importance of research on radiation-induced carcinogenesis and risk assessment with a view to radiation protection.

One of the well-known late effects of radiation is the increased incidence of leukemia that occurred among atomic bomb survivors beginning two or three years after exposure. A remarkable increase of solid tumors including cancers of the thyroid, breast and lung was also observed 10 to 20 years after exposure. Thus, many pathological, clinical and epidemiological studies have been made on radiation carcinogenesis in atomic bomb survivors by investigators at the Atomic Bomb Casualty Commission (ABCC), now known as the Radiation Effects Research Foundation (RERF), as well as by the staff of universities in Hiroshima and Nagasaki. Some of the mechanisms involved in radiation carcinogenesis in man and associated modifying factors, such as age at time of exposure and sex, have been elucidated by these studies. The results obtained are being used by such agencies as the International Commission on Radiation Protection (ICRP) for risk estimations of radiation exposure.

This monograph presents the results realized thus far in these epidemiological and pathological studies. The incidence of radiation-induced cancer among atomic bomb survivors continues to be high 40 years after exposure, and much remains unknown about radiation carcinogenesis. It is hoped that this publication will stimulate the promotion of further studies.

Questions were raised recently on the dosimetry system which has been used as the basis for estimating the risks of carcinogenesis in atomic bomb survivors. As a consequence, a joint reassessment was undertaken some years ago by the U. S. and Japan.

It had been hoped that this radiation dosimetry reassessment, the status of which was reported and discussed at workshops in 1981, 1983 and 1985, would be available for the analyses presented in this monograph. Regrettably, due to the complex nature of the matter a report at the workshop in March 1986 stated that completion of the task was still several months away. Further delay, therefore, in release of this monograph does not appear justified.

It is clear from earlier reports that the estimated radiation dose from neutrons will be sharply reduced and that the estimated gamma dose will increase in Hiroshima, but will decrease slightly in Nagasaki. The shape of the dose-response curve and magnitude of risk coefficients may be altered slightly, but preliminary analyses based on incomplete data suggest that no major change will occur in the determination of the relation of radiation to cancer occurrence.

Many people have contributed to the production of this monograph. In particular,

we wish to commend Dr. Hiroo Kato, Dr. Suminori Akiba, and Mr. Geoffrey Day for their invaluable editorial assistance and Mrs. Merry Y. Uemoto for her expert word processing.

May 1986

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