Breast Cancer Detection by Mammography

The Final Reports of the National Cancer Institute Ad Hoc Working Groups on Mammography in Screening for Breast Cancer and a Summary Report of Their Joint Findings and Recommendations are published in the August issue. The combined recommendations of the Groups were that (1) the dose of radiation to the midpoint of the breast should not exceed one rad per complete examination, and attempts should be made to lower the dose with advanced technology; (2) mammography for routine screening of women below 50 years of age should be discontinued; and (3) further support by the National Cancer Institute of screening programs for breast cancer with the use of mammography should be concentrated on the design of randomized clinical trials to validate its use.

The Three Groups Reporting

The three Working Groups were Epidemiology-Statistics, chaired by Breslow (University of California at Los Angeles, Los Angeles, California); Pathology, chaired by Thomas (National Cancer Institute, Bethesda, Maryland), and Radiation Carcinogenesis, chaired by Upton (State University of New York at Stony Brook, Stony Brook, New York). Their reports were written in response to a request made in October 1975 by Dr. Guy R. Newell, Deputy Director of the National Cancer Institute “to estimate the gross and net benefits of adding X-ray mammography to history and physical examination in the HIP breast cancer screening project...to review the gross and microscopic findings of breast cancer found among members of the screened population in the HIP study with respect to differentiation, infiltration and other prognostic factors...and...to estimate health hazards to screenees in the present practice of mammography.”

Recommendations of the Epidemiology-Statistics Group

The Epidemiology-Statistics Working Group recommended that (1) routine mammographic screening should be discontinued for women under 50 years of age, since the HIP study showed no benefits derived from such screening and since hazards exist from the radiation received; (2) the amount of radiation exposure received from mammography by women over 50 years old should not exceed a tissue dose of one rad for each complete examination; and (3) further randomized clinical trials should be undertaken for precise
measurement of the benefits and risks of various modalities in the detection of breast cancer.

Conclusions of the Radiation Carcinogenesis Group
The Radiation Carcinogenesis Working Group used data from epidemiologic studies of women treated with X-radiation of the breast for postpartum mastitis. U.S. and Canadian women given multiple fluoroscopic examinations of the chest during treatment of pulmonary tuberculosis, and Japanese women who survived the atomic bomb radiation and who were more than 10 years old at the time of exposure. All three populations have had an excess of breast cancer, which became evident five to 15 years after irradiation. Follow-up now extends to 30 years, and the data do not suggest that the excess risk will ever disappear. Since all available data indicate that the dose response for breast cancer is linear without a threshold, and since no other data on human risks are available, these observations were used to estimate the risks associated with the radiation doses used in mammography. The report concludes that "the risk may be assumed to approximate 3.5-7.5 cases of breast cancer per million women of ages 35 or older at risk per year per rad to both breasts, from the tenth year after irradiation throughout the remainder of life." The risk of carcinogenic effects of irradiation may be higher in women who have other high risk factors.

Observations of the Pathology Group
Several important observations were made by the Pathology Working Group. Among these were (1) that negative mammograms in the HIP study were no assurance that a patient did not have breast cancer; (2) that mammography was ineffectual in detecting minimal breast cancer in the HIP study; (3) that many infiltrating cancers said to be detected only by mammography could also be found by skilled physical examination once the examiner's suspicions had been raised; (4) that the slight mortality difference at seven years found between the study group and the controls was due to in situ cancer being diagnosed more frequently in the study group; and (5) that the use of mammography in screening asymptomatic women is seriously questioned.

The Cost of Cancer
The current economic burden of cancer in the United States was estimated by Scotto (National Cancer Institute, Bethesda, Maryland) and Chiazze (Georgetown University School of Medicine, Washington, D.C.), using annual age-specific cancer prevalence and hospitalization costs derived from the Third National Cancer Survey. Data for hospital payments were used rather than charges, since hospital bills do not reflect discounts and write-offs usually made to third-party payors.

Estimates were that $3.5 billion would be spent in 1976 for the hospital care of over 1.5 million cancer patients ($2,282 per admission); 50.3 percent of this amount would be spent for patients less than 65 years old at the time of first diagnosis. Cost differences were calculated by site: younger patients with skin melanoma and cancers of the uterine cervix, bone, and brain account for 72-85 percent of all payments related to these sites; in contrast, older patients with cancers of the digestive, urinary, and male genital systems account for 60-80 percent of all expenditures related to these sites.

If the administration of new and recent medical breakthroughs for the care of patients with cancer requires repeated, costly hospital care to improve survival, the data on the prevalence to incidence basis can be used to anticipate the economic load in store for the surviving cancer patient.