208 Multi-Stage Carcinogenesis Theory of Skin Cancer Incidence among the Nagasaki A-Bomb Survivors.

*Sumihisa HONDA, **Naoki SADAMORI, *Mariko MINE;
*Scientific Data Center for the A-Bomb Disaster, Nagasaki Univ. School of Medicine, Nagasaki 852,
**Dept. of Hematology, Atomic Disease Institute, Nagasaki Univ. School of Medicine, Nagasaki 852.

We analyzed the malignant skin cancer incidence rates among the Nagasaki A-bomb survivors. The number of cases were 135 (60 male, 75 female), and the mean duration of time from the bombing to the cancer incidence was 34.3 years. Fitting some stochastic models (e.g., Weibull, exponential, and log-normal) to the age-specific cancer incidence distribution, the Weibull distribution was best fitted. The Weibull distribution of age-specific cancer incidence is one of the mathematical formulation of multi-stage carcinogenesis theory. The number of stages is approximately obtained as the shape parameter of Weibull distribution. Our analyses suggested 8 (male) or 7 (female) carcinogenic stages in skin cancer incidence among the A-bomb survivors.

209 **Association between brain damage and physical measurements or IQ values in prenatally exposed A-bomb survivors.** *Masanori Otake, **Hiroshi Yoshimaru, ***William J. Schull[3] and *Sachiko Funamoto. *RERF Department of Statistics, **Department of Genetics, Ministry of Agriculture, Forest and Fisheries, and ***School of Public Health, Texas University.

The pervasiveness of abnormal brain development caused by prenatal exposure to ionizing radiation is still largely unknown. Described here is the relationship between radiation dose and two measures of neuromuscular performance, one of grip strength and the other of repetitive-action speed. A multivariate analysis of covariance was used to evaluate the effect of several covariates such as prenatal radiation exposure and some physical measurements or IQ scores, adding city and sex as categorical factors. When mentally retarded cases were included, a statistically significant effect of radiation exposure on the grip-strength and repetitive-action test scores was seen in 8-15th weeks postovulation, and a statistically suggestive effect at 16-25 weeks postovulation. No effect of radiation exposure on the two test scores was noted for prenatal exposure in either periods when mentally retarded cases were excluded, but a statistically significant diminution of IQ scores was noted for exposures ≥16 weeks postovulation. We discussed, from the biological perspective, the projected standard scores for exposures ≥16 weeks postovulation, and the possibility of lower IQ scores, small heads and mild mental retardation related to radiation exposures ≤15 weeks postovulation with mentally retarded cases excluded.

210 Relationships between low dose A-bomb radiation and examination results

Hisayoshi KONDO, Mariko MINE, Kenichi YOKOTA, Norio NIIKAWA
Scientific Data Center for the A-bomb Disaster, Nagasaki University School of Medicine; Nagasaki 852.

The relationships between low dose A-bomb radiation (less than 30 cGy) and examination results were investigated. The coefficients of variation of health checks for individuals were calculated for erythrocyte counts, logarithmic value of leukocyte counts, hemoglobin, systolic blood pressure and diastolic blood pressure. The coefficients of variation for each health check item indicates the amount of fluctuation of the results. The U-shaped dose-response relationships were observed on erythrocyte counts and systolic blood pressure in male, however those were not observed on other items and in female.