

Hyperparathyroidism among Atomic Bomb Survivors in Hiroshima

SAEKO FUJIWARA,* RICHARD SPOSTO,† HARUO EZAKI,* SUMINORI AKIBA,‡ KAZUO NERIISHI,*
KAZUNORI KODAMA,* YUTAKA HOSODA,* AND KATSUTARO SHIMAOKA§

Departments of *Clinical Studies, †Statistics, and ‡Epidemiology, and §Associate Chief of Research,
Radiation Effects Research Foundation, 5-2 Hijiyama Park, Minami-ku, Hiroshima City 732, Japan

FUJIWARA, S., SPOSTO, R., EZAKI, H., AKIBA, S., NERIISHI, K., KODAMA, K., HOSODA, Y., AND SHIMAOKA, K. Hyperparathyroidism among Atomic Bomb Survivors in Hiroshima. *Radiat. Res.* 130, 372-378 (1992).

To determine the effect of exposure to atomic bomb radiation on the occurrence of hyperparathyroidism, the prevalence was determined among a population of 3,948 atomic bomb survivors and their controls in Hiroshima. The diagnosis of hyperparathyroidism was based upon histopathological findings or the presence of consistent hypercalcemia and elevated levels of serum parathyroid hormone. Primary hyperparathyroidism was diagnosed in 19 persons (3 males, 16 females). Females had approximately a threefold higher overall prevalence of hyperparathyroidism than males ($P < 0.05$). The prevalence rates of hyperparathyroidism increased with radiation dose ($\chi^2 = 12$, $P < 0.001$) after adjusting for sex and age at the time of the bombing. The estimated relative risk was 4.1 at 1 Gy (95% confidence limits 1.7 to 14). There was some evidence that the effect of radiation was greater for individuals who were younger at the time of the bombing. In conclusion, exposure to atomic bomb radiation affected the occurrence of hyperparathyroidism, suggesting that doses of radiation lower than those used in radiotherapy may also induce this disorder. © 1992 Academic Press, Inc.

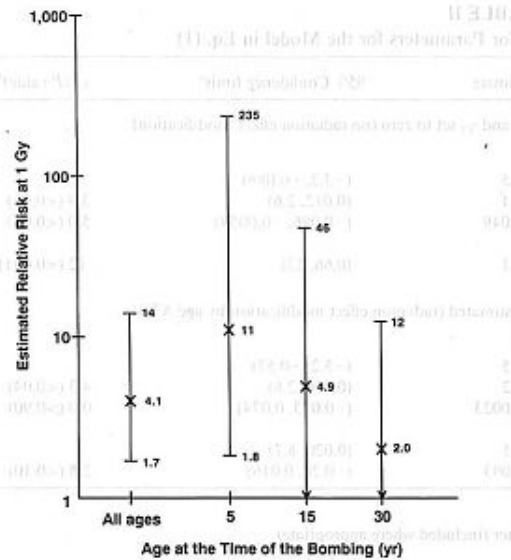


FIG. 1. Relative risk of hyperparathyroidism at 1 Gy compared to 0 Gy for all ages at the time of the bombing (ATB) combined and for three specific ages ATB. Ninety-five percent confidence bounds are also shown. Confidence bounds for the three ages are simultaneous 95% bounds.

TABLE I
Study Subjects, Observed Prevalent Cases, and Prevalence Rate (%) of Hyperparathyroidism by Thyroid Dose,
Sex, and Age at the Time of the Bombing (ATB) (3948 Individuals with DS86)

Thyroid dose (Gy)	Males (age ATB)			Females (age ATB)		
	0-9	10-19	20+	0-9	10-19	20+
Total						
Hyperparathyroidism	2	0	1	4	6	6
No. examined	201	553	471	321	815	1587
0.000-0.009 Gy						
Hyperparathyroidism	0	0	0	1	0	2
No. examined	79	223	203	133	327	618
Prevalence rate (%) ^a	0.084	0.081	0.078	0.27	0.26	0.25
0.01-0.499 Gy						
Hyperparathyroidism	0	0	1	0	3	0
No. examined	41	177	161	100	271	603
Prevalence rate (%)	0.28	0.14	0.094	0.77	0.45	0.31
0.50-0.999 Gy						
Hyperparathyroidism	1	0	0	1	2	1
No. examined	32	66	60	39	114	203
Prevalence rate (%)	0.68	0.29	0.14	2.3	0.99	0.48
1.00+ Gy						
Hyperparathyroidism	1	0	0	2	1	3
No. examined	49	87	47	49	103	163
Prevalence rate (%)	1.9	0.67	0.20	5.4	2.3	0.81

^a Estimated prevalence rates derived from the model in Eq. (1) with the parameter estimates shown in Table IIB.

広島原爆被爆者の放射線白内障 1949-64 年

(William J Shull, 大竹正徳、船本幸代、RERF TR 11-92)

研究目的

1949-64 年の眼科調査で得られた白内障のデータを使って、DS86 線量を用いて、原爆被爆者における白内障の線量との関係を解析する。

研究方法

DS86 線量推定値が得られている広島原爆被爆者 2249 人について、1949-64 年の間に眼科調査で認められた後囊下混濁と電離放射線被曝と線量との関係を再解析した。

研究結果

DS86 眼臓器線量を用いた場合の放射線白内障における閾値は 1.75Sv (95%信頼区間 1.31-2.21) と推定される。