

原爆被爆者における白内障

(Int J Radiat Biol 80:339-345,2004)

研究目的

被ばく後 55 年経過後に、眼科調査に基づいて診断された白内障の有病率と放射線被ばく線量との関係を検討する。

研究方法

被ばく時年齢 13 歳未満、あるいは 1978-80 年に成人健康調査眼科調査を受け、かつ、2000-2002 年の眼科調査を受けた広島、長崎 AHS 受診者 913 人を対象とした。

白内障は、眼科医によるスリットランプ、デジタル写真、白内障グレーディングシステムに基づき診断された。悪いほうの目の所見を使った。

線量は DS86 の眼臓器線量を用いた。

研究結果

1. 1 Sv あたりのオッズ比は、核色濁は 1.07 (95%信頼区間 0.90-1.27)、核混濁 1.12 (0.94-1.30)、皮質混濁 1.29 (1.12-1.49)、後囊下混濁 1.41 (1.21-1.64) であった。

(Fig 1)

2. 前回の調査 (1978-80 年) で後囊下混濁が認められた 13 例を除いても同じ結果が得られた。

Cataract in atomic bomb survivors

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Abstract.

Purpose: Ophthalmologic examinations were conducted on atomic bomb (A-bomb) survivors 55 years after exposure.

Materials and methods: A-bomb survivors who had been exposed before 13 years of age at the time of the bombings in 1945 or who had been examined in a previous study between 1978 and 1980. The examinations, conducted between June 2000 and September 2002, included slit-lamp examination, digital photography and a cataract grading system for three parts of the lens (nucleus, cortex and posterior subcapsule) as an outcome variable. Proportional odds logistic regression analysis was conducted using the lowest grading class as a reference and included explanatory variables such as age, sex, city, dose and various cataract-related risk factors. When the grades in an individual differed, the worst grade was used.

Results: Results indicate that odds ratios (ORs) at 1 Sv were 1.07 (95% confidence intervals [CI] 0.90, 1.27) in nuclear colour, 1.12 (95% CI 0.94, 1.30) in nuclear cataract, 1.29 (95% CI 1.12, 1.49) in cortical cataract and 1.41 (95% CI 1.21, 1.64) in posterior subcapsular cataract. The same was true after excluding 13 people whose posterior subcapsular cataracts had been previously detected.

Conclusion: Significant radiation effects were observed in two types of cataracts in A-bomb survivors.

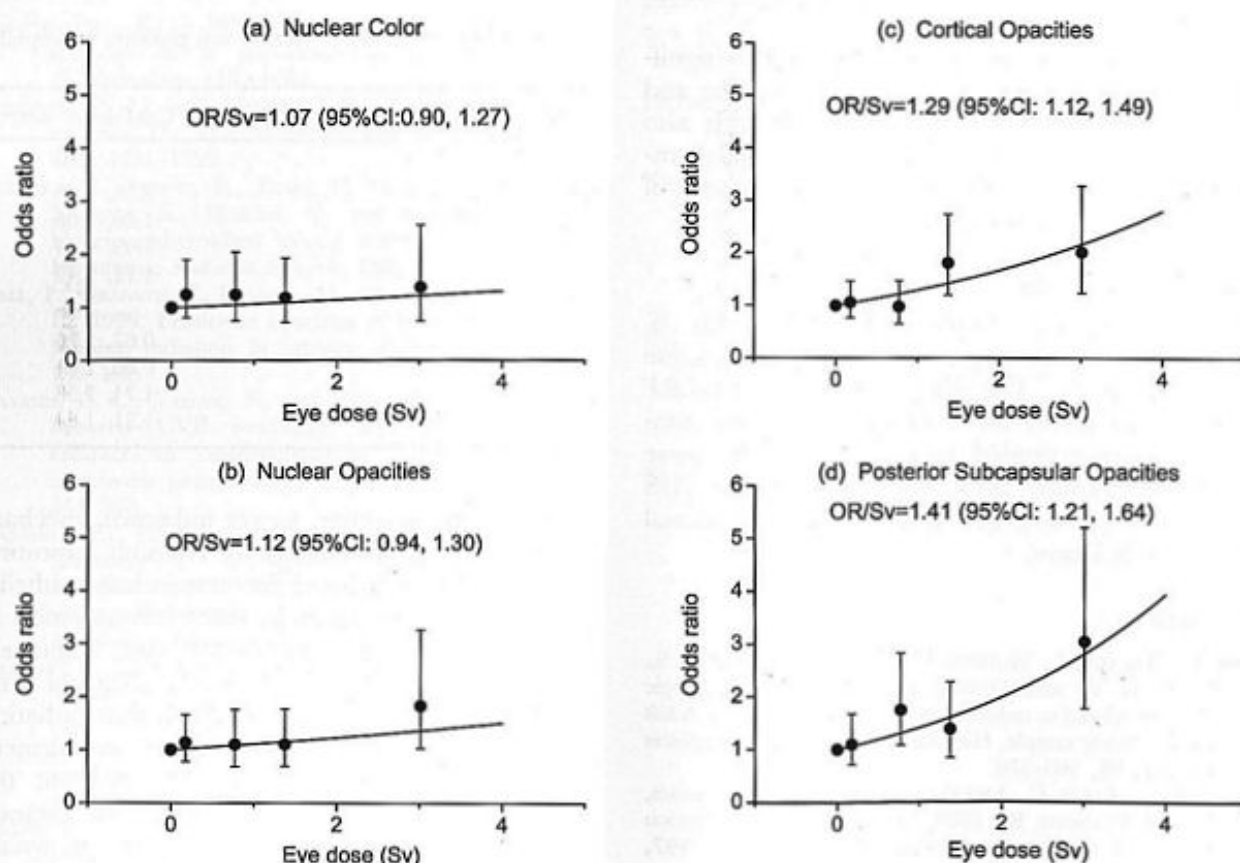


Figure 1. Odds ratios (OR) of the prevalence for nuclear colour (a), nuclear opacities (b), cortical opacities (c) and posterior subcapsular opacities (d) at 1 Sv (DS86) in 873 A-bomb survivors during 2000–02 using a proportional odds regression model with ‘no opacity’ as the reference of the LOCS II and adjusting for city, sex and age at the time of the bombings.

原爆被爆者における白内障手術後症例：放射線線量反応と閾値

(Radiat Res 168;404-408,2007)

研究目的

白内障手術後の症例と放射線被ばく線量との関係を検討した。

研究方法

対象者は2000-2002年にAHSの健診を受けた3761人である。診断は、健診時に得られた白内障手術後の病歴に基づいた。

線量はDS02の眼臓器線量を用いた。

研究結果

1. 白内障術後の人は479人であった。
2. 白内障術後であった人のオッズ比は、1 Gyあたり1.39 (95%信頼区間 1.24-1.55)であった。有意ではない線量閾値0.1Gy (<0-0.8)を認めた。(8ページ Fig 1)

Postoperative Cataract Cases among Atomic Bomb Survivors: Radiation Dose Response and Threshold

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Neriishi, K., Nakashima, E., Minamoto, A., Fujiwara, S., Akahoshi, M., Mishima, H. K., Kitaoka, K. and Shore, R. E. Postoperative Cataract Cases among Atomic Bomb Survivors: Radiation Dose Response and Threshold. *Radiat. Res.* 168 404–408 (2007).

Recent evidence argues against a high threshold dose for vision-impairing radiation-induced cataractogenesis. We conducted logistic regression analysis to estimate the dose response and used a likelihood profile procedure to determine the best-fitting threshold model among 3761 A-bomb survivors who underwent medical examinations during 2000–2002 for whom radiation dose estimates were available, including 479 postoperative cataract cases. The analyses indicated a statistically significant dose-response increase in the prevalence of postoperative cataracts [odds ratio (OR), 1.39; 95% confidence interval (CI), 1.24–1.55] at 1 Gy, with no indication of upward curvature in the dose response. The dose response was suggestive when the restricted dose range of 0 to 1 Gy was examined. A nonsignificant dose threshold of 0.1 Gy (95% CI, <0–0.8) was found. The prevalence of postoperative cataracts in A-bomb survivors increased significantly with A-bomb radiation dose. The estimate (0.1 Gy) and upper bound (0.8 Gy) of the dose threshold for operative cataract prevalence was much lower than the threshold of 2–5 Gy usually assumed by the radiation protection community and was statistically compatible with no threshold at all. © 2007 by Radiation Research Society

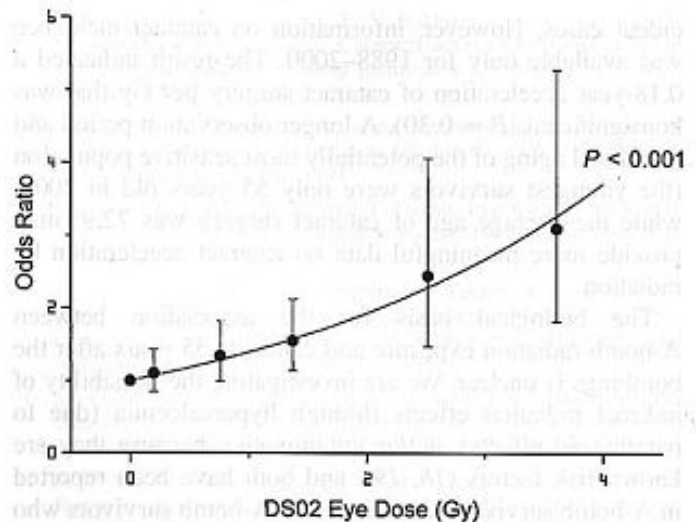


FIG. 1. The main-effect model dose-response curve in regression analysis after adjusting for city, sex, age at the time of the bombings, and diabetes mellitus in A-bomb survivors who had undergone lens removal surgery (OR at 1 Gy, 1.39; CI, 1.24–1.55). Mean doses (Gy) for dose categories are 0.199 for $0.005 \leq d < 0.50$, 0.759 for $0.5 \leq d < 1.0$, 1.373 for $1.0 \leq d < 2.0$, 2.517 for $2.0 \leq d < 3.0$, 3.610 for $3.0 \leq d$, respectively.