Warning from Fukushima? Radiation Dose and Prevalence of Thyroid Nodules has Positive and Significant Correlation.

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INTRODUCTION: After the Fukushima–Daiichi nuclear power plant disaster, thyroid screening was performed in subjects who were aged ≤18 years. This study examined the relationship between the number of participants with thyroid nodules and radiation dose, using publicly available municipality level data (n = 25).

METHODS: Poisson regression was applied to that data. The numbers of participants with smaller nodule (<5 mm), with larger nodule (>5.1 mm), and sum of them are explained by WHO thyroid dose, year of screening dummy, average age of participants (or percentage of age group), fraction of early evacuation, and whether stable iodine was distributed.

RESULTS: The WHO thyroid dose had positive and significant coefficients for three dependent variables. The z-value was larger for smaller nodules (b = 0.017, z-value = 5.75, P = 0.000) than for larger nodules (b = 0.009, z-value = 2.71, P = 0.007). Malignancy (including suspected malignancy) was analyzed in the same manner, the dose was insignificant. However, the number of nodules and that of malignancy, including suspected malignancies, were positive and significantly correlated.

CONCLUSIONS: Although this is an ecological study based on aggregated secondary data, and causality should not be inferred, the results might indicate an early warning for future incidence of thyroid cancer. A follow-up study is therefore necessary.