

# LETTER TO THE EDITOR

(JULY 20, 2014)

## ASSESSMENT OF SELECTED B CELLS POPULATIONS IN THE WORKERS OF X-RAY DEPARTMENTS

Dear Editor,

We are writing to express our concern about the article by Kłuciński et al. entitled “Assessment of selected B cells populations in the workers of X-ray departments” that was published in the “International Journal of Occupational Medicine and Environmental Health” 2014;27(3): 467–73 [1]. In this report, the authors have concluded that occupational exposure of the personnel of X-ray departments has led to adverse immunological effects such as an increase in the total number of CD19+ cells and the associated decrease of CD5+CD19+ cells percentage and CD27+CD19+/CD19+ as well as CD5+CD19+/CD19+ cell ratios that may suggest B cells dysfunction in the immune response against both non T-dependent and T-dependent antigens [1].

This study was performed on 47 radiation workers and a control group consisting of 38 individuals. The paper, however, has some serious flaws. The authors stated “The annual effective dose of X-radiation was below 1 mSv.” As they did not mention the mean and standard deviation of the radiation dose, we don’t know anything about the magnitude of occupational exposure of the radiation workers who participated in this study. The authors even did not mention if any of the participants was involved in interventional procedures, which usually cause higher exposures.

It should be noted that according to a study conducted on 144 X-ray workers in the Netherlands, it was claimed

that the effective dose for 131 of the 144 radiological workers was lower than it would have been if they had stayed at home: “In 2008 only 13 of the 144 radiological workers received a dose higher than their not-working equals [2]. All 13 were involved in interventions or fluoroscopic studies. The dose savings due to radon and external radiation were about equal in our department” [2].

On the other hand, we and other investigators have previously shown that exposure to low levels of ionizing radiation has no effect on the immune system [3], or even may lead to some immunostimulatory effects.

Ina and Sakai have previously shown that chronic whole body exposure of mice to low-dose-rate radiation, significantly increased CD4+ T cells and CD8 molecule expression, and significantly decreased CD40+ B cells. The authors have concluded that chronic low-dose-rate radiation activated the immune system of the exposed animals [4]. Those authors have also reported that chronic exposure of mice to low-dose-rate gamma radiation at 0.35 or 1.2 mGy/h for 5 weeks significantly increased their life span, accompanied by immunological activation [5].

In a study performed by Attar et al. [6] on the residents of very high background radiation areas (VHBRAs) of Ramsar it has been shown that those residents had higher lymphocyte-induced IL-4 and IL-10 production, and lower IL-2 and IFN-g production compared to the residents of areas with normal background radiation. Furthermore, neutrophil NBT, phagocytosis and locomotion were higher in the residents of VHBRAs. The authors have concluded that the immune system of the individuals

exposed to high dose ionizing radiation has adapted to their environment [6].

Looking at it in that light, the findings of Kłuciński et al. [1] may be severely affected by the lack of data about the radiation dose received by each radiation worker. We hope that these comments will be useful in obtaining more reliable results in the future.

**Key words:**

**Immune system, B cells, Radiation workers, X-ray departments, Occupational exposures**

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