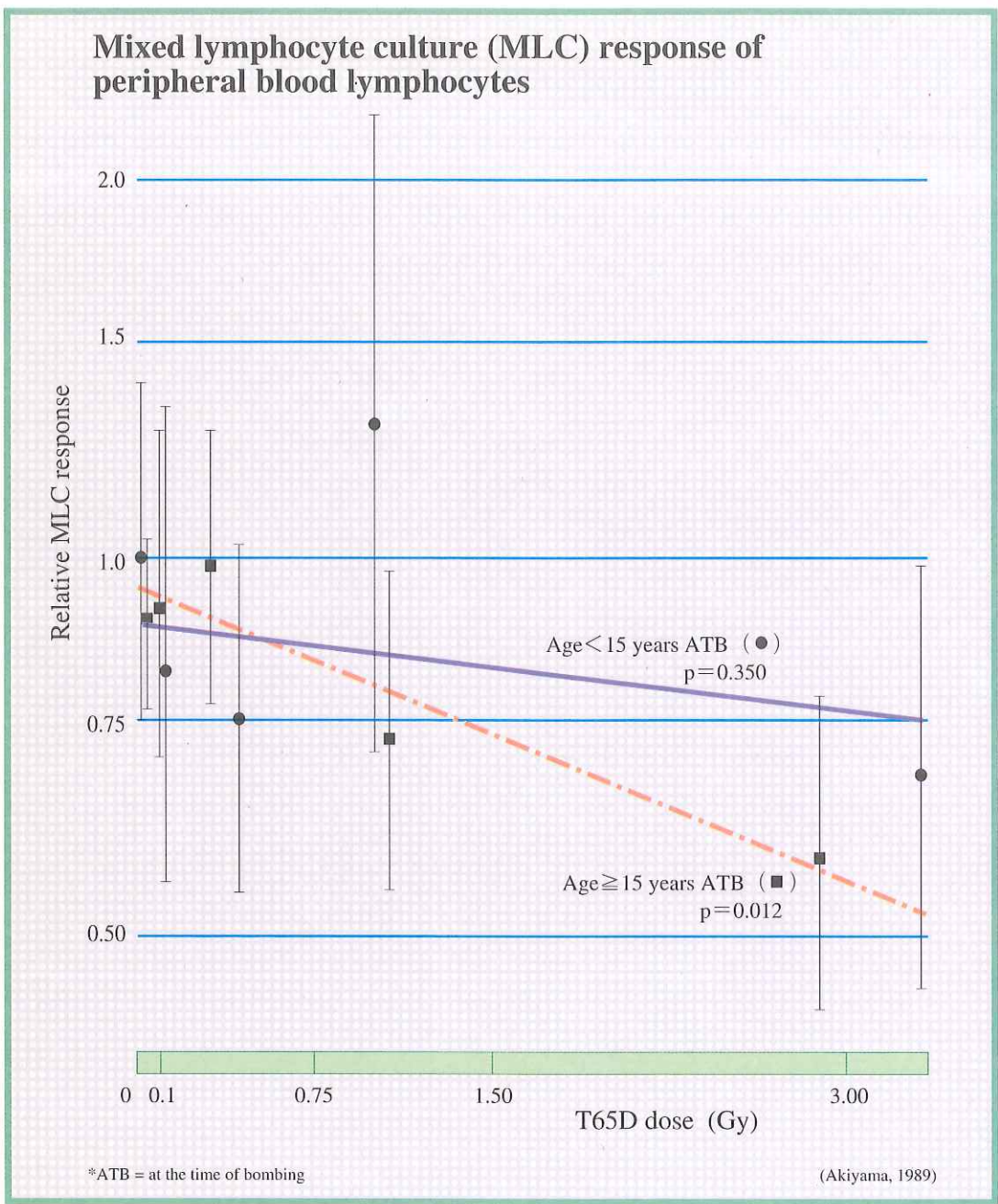


1. PHA and MLC responses of peripheral blood lymphocytes

Studies on whether the atomic bomb damage inflicted on the immune system persists in the long term are believed extremely important for clarification of the relationship between radiation exposure and the development of disease. Studies

on the late effects of atomic bomb radiation showed that T-lymphocytes in older survivors exhibited decreased function and reduced cell counts.

The above diagram shows the response to phytohemagglutinin (PHA), the mitogen stimulating all T-lymphocytes.

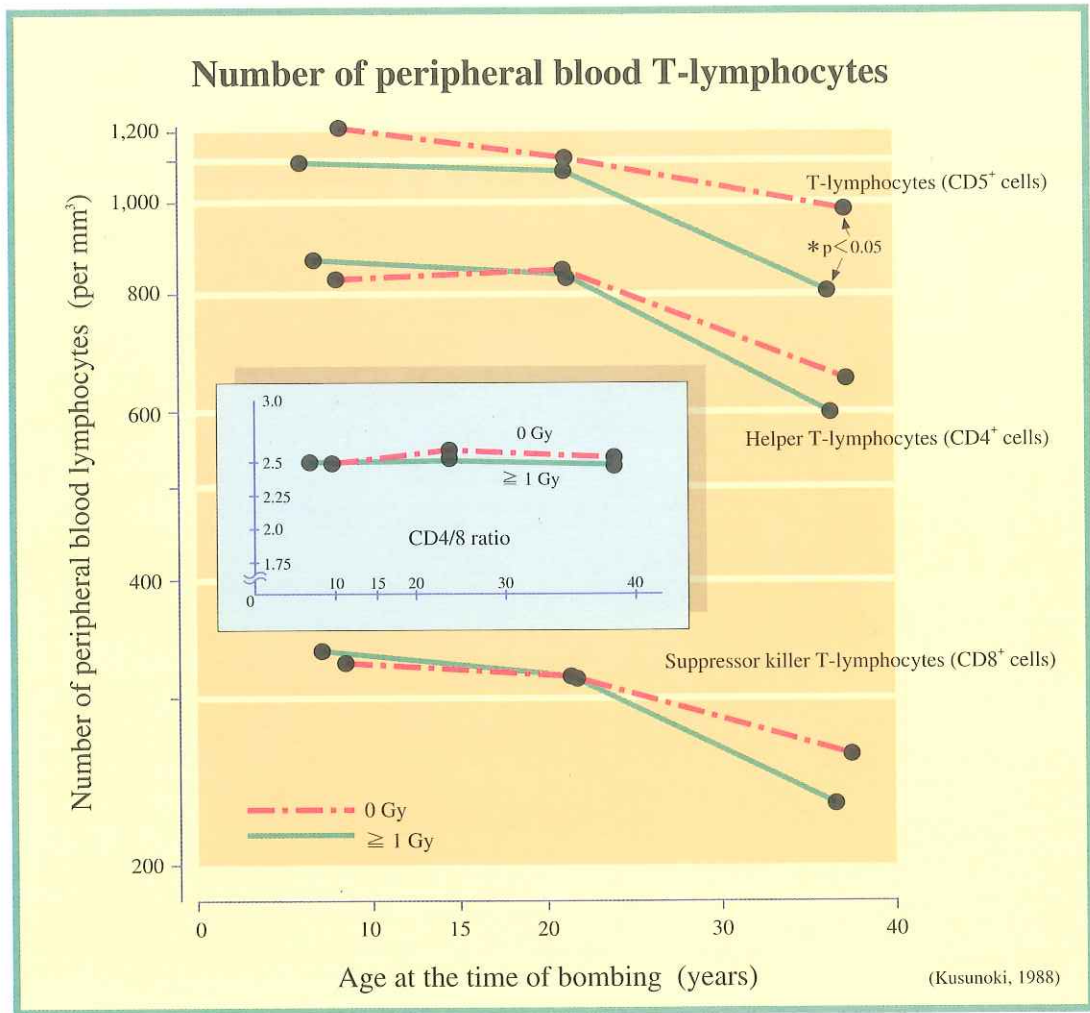


The above diagram illustrates the relative response to allogeneic antigen (the mixed lymphocyte culture [MLC] response).

These results suggest that heavily exposed survivors exhibited a marked age-related decrease in response, and that a dose-dependent decrease in response occurred among older survivors. In other words, a strong radiation effect was observed in the T-lymphocyte func-

tion of the older ATB groups*.

*(ATB = at the time of bombing)



2. Numbers of peripheral blood T-lymphocytes

Studies on the numbers of peripheral blood T-lymphocytes using monoclonal antibodies have produced similar results to those on peripheral blood lymphocyte function. These age-related effects are believed due to the incomplete post-exposure recovery of T-lymphocytes among older survivors (who experience thymal degradation) in comparison to those exposed at younger ages.

Serologic studies have reported decreased immunocompetence among heavily exposed survivors with respect to influenza viruses, the hepatitis B virus, and the Epstein-Barr (EB) virus.

Recent studies have found a small but significant increase among heavily exposed survivors in positive rates of serum rheumatoid factor, and in serum IgM and IgA level (female survivors).

However, the frequency of various infectious and autoimmune diseases among heavily exposed survivors has not been found to be significant, and thus disease data is not always consistent with the immunological findings.