

## Possible Links Between Radioactive Discharges and Cancer

**TO THE EDITOR:** The November 1990 issue of *The Journal of Nuclear Medicine* contained an article by Palash R. Ghosh reviewing recent studies that examined possible links between radioactive discharges and cancer (1). Among the studies mentioned was one conducted by Doctors Byers and Vena of the State University of New York at Buffalo, which examined cancer incidence in the vicinity of West Valley, New York. This study was not sponsored by the New York State Department of Health.

Pursuant to the New York State Low Level Radioactive Waste Management Act of 1986, the New York State Department of Health has been conducting a public information program on the health effects of radiation. As a part of this program, we have assembled available information on the health experience of populations residing near nuclear facilities in New York State and other states. The Byers and Vena study was one such piece of information. The study, which was not well-known, as it had not been published, was available on request from the authors. The Department of Health did not release the study but did prepare a brief fact sheet with the approval of Dr. Vena, which outlined the study and its results. This fact sheet was made available to the public along with information about other such studies. The names and addresses of the study's authors were also provided in the fact sheet for those who wished to obtain further information.

The article claims the New York State Department of Health said that the West Valley Coalition "had tried to rally the public against low-level waste sites" and "kept the study's results concealed." The Department has never made either statement.

### REFERENCE

1. Ghosh PG. Cancer clusters: latest studies do not support link between cancer mortality and radiation discharges [Newline]. *J Nucl Med* 1990;31:11A.

Rita Aldrich  
State of New York  
Department of Health  
Albany, New York

## Compensatory Splenic Growth

**TO THE EDITOR:** The interesting article by Budihna et al., "Long-Term Follow-up After Heterotopic Splenic Autotransplantation for Traumatic Splenic Rupture" (*J Nucl Med* 1991;32:204-207), and the associated editorial review, "Compensatory Splenic Growth: Role of Functional Indicators," by R. Spencer (*J Nucl Med* 1991;32:207-209) prompt these comments.

1. *Stimulus* for growth of splenic tissue. Jacob et al. (1) showed that the growth and function of spleen, spleen autografts and liver, as measured by their size and their ability to sequester altered red cells, was proportional to the "work" required. Spleen grafts in asplenic rats grew larger and functional more actively than did such grafts in normal and hemisplenectomized (hemisplx) rats. Increasing the "work load" by imposing a hemolytic process produced a hyperplastic response both in spleens and spleen grafts. The stimulus was thought to be local and particu-

late, since splenic tissue inside i.p. diffusion chambers (pore size  $0.45 \mu$ ) in splx animals remained viable but did not grow.

2. *Maximum growth* of splenic tissue. Metcalf (2) found that when splx host mice were grafted with multiple histocompatible spleens per mouse, the eventual total mass of grafted splenic tissue reached a plateau which approximated that of the original normal spleen. In one group of patients with postsplx splenosis (3), the largest implant mass (133 g) was at the peak incidence of normal spleen mass (4). In a patient who underwent splx for Felty's syndrome, half of a transected accessory spleen was left in situ; two years later it too was removed after it had increased in mass to 1040 g (5). The ultimate mass of splenic tissue is thus determined by the work demand.

3. The *adequacy of immunological function* in asplenic patients with splenic grafts or implants. While such grafts preserve some spleen function, fatal infections have occurred in such patients (6). Splenosis patients with large implants are also still at risk. A patient had 92 g of ectopic splenic tissue following splx-for-trauma, yet died from infection (7). We have seen a patient who had undergone splx-for-trauma at age 4 yr (8,9). Operations at 8, 19, and 29 revealed progressive growth of implants. She had had many infections and at 35, nonimmunized, she had near-fatal pneumonia. At 39, imaging studies, including angiography, revealed widespread splenosis, with a good arterial supply from the right internal iliac artery to a large pelvic implant (>87 g), well visualized and measurable on ultrasound studies. Total mass of splenic tissue was in the range of that of a normal spleen (4).

Rabbit studies have shown that clearance of pneumococci was directly related to arterial blood flow/g of splenic tissue (10). Hemisplx reduced both only slightly, but splenic artery ligation alone (in which spleen mass remained normal) and splx with splenic tissue grafting reduced both markedly.

In a lucid review, Styrk (6) summarizes the immune function of the spleen as participating in the generation of a variety of mediators (of phagocytosis), perhaps mechanically filtering non-opsonized organisms, providing a setting in which cells of the immune system can interact for maximal anticapsular antibody production, and providing a critical population of phagocytes capable of ingesting microbes after a minimum of opsonization. Thus, an asplenic patient with ectopic splenic tissue could be immunologically deficient to a variable degree because of multiple factors: inadequate arterial perfusion (10); an insufficient mass of the normal components of splenic tissue; or structural defects within it (7).

It is time for more sophisticated correlative research on the spleen.

### REFERENCES

1. Jacob HS, MacDonald RA, Jandl JH. Regulation of spleen growth and sequestering function. *J Clin Invest* 1963;42:1476-1490.
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3. Corazza GR, Tarozzi C, Vaira D, et al. Return of splenic function after splenectomy: how much tissue is needed? *Br Med J* 1984;289:861-864.
4. Myers J, Segal RJ. Weight of the spleen. I. Range of normal in a nonhospital population. *Arch Path* 1974;98:33-35.
5. Fleming CR, Dickson ER, Harrison EG. Splenosis: autotransplantation of splenic tissue. *Am J Med* 1976;61:414-419.
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7. Rice AM, James JE. Ectopic splenic tissue failed to prevent fatal pneumococcal septicemia after splenectomy for trauma. *Lancet* 1980;1:565-566.