

Urological concern and postcrisis Japanese nuclear accident

Sir,

The nuclear accident is a totally unwanted episode. The present concern on nuclear hazard is the accidental leakage of radioactive materials from the Japanese disrupted nuclear power plant after the attack of the earthquake and tsunami. It is conclusive that the leaked nuclear materials are hazardous to exposed population. Although there are a lot of evidences of the health disorders due to exposure to radioactive materials, the specific evidences on the urological system are few. Here, the author performs a short review using the standard database, PubMed search, focusing on the urological concern and nuclear leak crisis.

The most widely focused issue of exposure to nuclear material is the induction of cancer. It is clear that exposure can induce thyroid cancer. However, in urology, it is still doubtful whether exposure to nuclear materials can result in urinary bladder carcinogenesis. Based on the accumulated evidences from the previous famous nuclear leakage situation, Chernobyl, Romamnenko *et al.* concluded that “the microenvironmental changes induced by chronic long-term, low-dose IR also appear to promote angiogenesis and remodeling of the extracellular matrix that could facilitate invasion as well as progression of pre-existing initiated cells to malignancy.”^[1] There are many reports on the process of urinary bladder carcinogenesis.^[2-5]

At least, chronic exposure to ionizing radiation is considered an important stress and can result in DNA dysfunction.^[2,3] As a consequence, the upregulation of fibroblast growth factor receptor 3, epidermal growth factor receptors, and other factors, which are important part of pathobiological processes inducing urothelial dysplasia and carcinoma is reported.^[4,5]

Erectile and ejaculation dysfunction is another important urological concern. Impotence is mentioned as an important urogenital complication of exposure to leaked radioactive materials.^[6,7] One-third of highly exposed subjects presented with erectile and ejaculation dysfunction.^[6,7] A “decrease of ejaculate volume and the number of spermatozoa with increasing of part of immovable and degenerated forms” in semen is detectable.^[8]

Adverse effect on prostate gland is another concern in urology. It is suggested that “long-term low dose internal ionizing radiation potentially may cause prostate cancer.”^[9] Indeed, an increased incidence of prostate cancer in exposed subjects of Chernobyl crisis is observed.^[10] In an immunohistochemistry study, hyalinosis, sclerosis, fibrosis, and extensive inflammatory infiltration in prostatic tissue of exposed subjects can be detected.^[11] If the exposed subjects have underlying benign prostatic hypertrophy, the change of carcinogenesis increases.^[9]

In conclusion, exposure to leaked radioactive materials can be hazardous to the urological system. It can induce carcinogenesis as well as other important urological disorders.

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Quick Response Code:	Website: www.urologyannals.com
	DOI: 10.4103/0974-7796.95578