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Study the Effect of Depleted Uranium Used by Coalition Forces in Increasing of Cancer Disease in Diyala governorate

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ABSTRACT
During the gulf war against Iraq the coalition forces used large amount depleted uranium DU .So this study aims to highlight the effects of DU on cancer disease in Diyala. The study shows that the direct or indirect exposure to depleted uranium DU cause an increasing in the rate of cancer disease in Diyala governorate specially in some kinds of cancer such as lung cancer, Leukemia and Breast cancer that show high level.

الخلاصة
أثناء حرب الخليج استخدمت قوات التحالف كميات كبيرة من اليورانيوم المستنفذ (المنضب). تأتي هذه الدراسة لتسليط الضوء إلى تأثيرات التعرض المباشر او غير المباشر إلى اليورانيوم المستنفذ في محافظة ديالى . وقد تمكنت الدراسة من الوصول إلى ان هذه التأثيرات أدت إلى زيادة في الأمراض السرطانية وبعضها بمعدلات عالية كسرطاني الرئة والصدر ومرض اللوكيميا (سرطان الدم).

INTODUCTION

Depleted uranium results from the enriching of natural uranium for use in nuclear reactors. Natural uranium is a slightly radioactive metal that is present in most rocks and soils as well as in many rivers and sea water. Natural uranium consists primarily of a mixture of two isotopes, Uranium-235 ($_{92}U^{235}$) and Uranium-238 ($_{92}U^{238}$), in the proportion of about 0.7 and 99.3 percent, respectively. Nuclear reactors require $_{92}U^{235}$ to produce energy, therefore, the natural uranium has to be enriched to

obtain the isotope $_{92}U^{235}$ by removing most of the $_{92}U^{238}$. Uranium-238 becomes DU, which is 0.7 times radioactive as natural uranium. Since DU has a half-life of 4.5 billion years, there is very little decay of those DU materials.

The first extensive use of DU was in the 1991 Arab Gulf War, depleted uranium (DU) weapons are made from nuclear waste products produced by enrichment of uranium for light water reactor fuel and nuclear warheads. The American nuclear industry stockpiles of DU provide cheap material for munitions production, and spare the nuclear industry the expense having to place the waste in long-term storage.

Munitions made of DU are heavier than lead or steel and penetrate tank armour more effectively. DU, which is composed of 99 percent Uranium 238, is highly pyrophoric (fine particles of DU are capable of spontaneously igniting). On impact DU produces uranium dioxide dust which is chemically toxic and radioactive and can readily be carried by wind. These airborne particles are small enough to be inhaled.

In 1998, a report was submitted to the Office of the United Nations Commissioner for Human Rights suggesting that the current health and environmental problems in Iraq may in part be linked to DU weapons used in the Gulf War. The report noted that the death rate per 1000 Iraqi children under 5 years of age increased from 23 in 1989 to 166 in 1993. Cases of lymphoblastic leukemia more than quadrupled with other cancers also increasing “at an alarming rate”. In men, lung, bladder, bronchus, skin, and stomach cancers showed the highest increase. In women, the highest increases were in breast and bladder cancer and non-Hodgkin lymphoma. In October 1998 the World Health Organization (WHO) initiated a two-year study of the increasing cancer rates, particularly leukemia in children.

Guenther, president of the Australian Yellow Cross International, also traced down an American war crime that had been previously kept secret and made it public internationally. He conducted extensive studies in Iraq on the effect of DU on Iraqi population. These studies produced ample evidence to show that contact with DU ammunition has the following consequences, especially for children:

- Considerable increase in infectious diseases caused by most severe immunodeficiencies in a great part of the population.
- Frequent occurrence of massive herpes and zoster afflictions, also in children;
- AIDS-like Syndrome;
- A hitherto unknown syndrome caused by renal and hepatic dysfunctions;

- Leukemia, elaptic anemia and malignant neoplasm;
- Congenital deformities caused by genetic defects, which are also to be found in animals.

PATIENTS & METHODS

The cancer diseases were recorded in Baquba General Hospital, Primary care center of Baquba and medical centers for cancer treatment in Baghdad for the period from August 1989 to December 2005. Types of cancer, sex of patients were studied. The most prevalent cancer diseases were also examined and statistically analyzed.

RESULTS

Table (1) and figure (1) below show the prevalent cancer disease among males and females before (before exposure to DU) and after the war (after exposure to DU) in direct or indirect ways. The lung cancer was elevated among males from 26 to 105, Breast cancer in the women was also elevated from 17 to 85 after the war, leukemia was also elevated from 22 to 92 after the war Some types of cancer such as larynx, skin, and liver among females was reported after the war only.

Table (1) Distribution of different cancer disease among patients in Diyala governorate before and after the gulf war

Cancer Disease	Males		Females		Total	
	1989	2004	1989	2004	1989	2004
Ca. Lung	23	135	3	17	26	152
Lymphoma	11	70	10	50	21	120
Leukemia	10	80	12	20	22	100
Ca. Breast	-	-	17	120	17	120
Ca. Larynx	15	75	5	20	20	95
Ca. Stomach	5	12	6	20	11	32
Ca. Bone	2	6	7	10	9	16
Ca. Nasopharynx	5	-	-	-	5	-
Ca. Thyroid	1	3	2	10	3	13
Ca. Colon	1	5	2	8	3	13
Ca. Salivary gland	1	-	1	2	1	2
Ca. Liver	2	7	2	8	4	15
Ca. Nose	-	-	-	2	-	2
Ca. Vagina	-	-	1	3	1	3
Ca. Ovary	1	-	3	20	4	20
Ca. Soft tissue	-	2	2	18	2	20
Ca. Tongue	1	-	-	-	1	-
Ca. Lip	1	-	-	1	1	1
Ca. Mouth	2	-	-	-	2	-

Ca. Bladder	9	40	4	12	13	52
Total					167	776

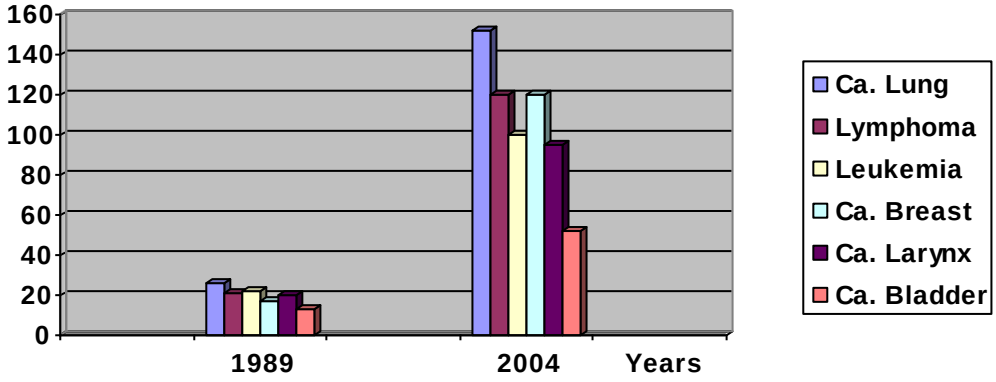

Figure (1) Distribution of the common types of cancers among patients in Diyala before and after the gulf war

DISCUSSION

The present study showed that males were under more risk of developing cancer diseases than females, and the statistical differences were significant ($P< 0.05$). The same conclusion was reported by Saleem (1990).The explanation for such difference may be due to occupational, environmental, anatomical, and physiological differences between males and females. Moreover the present study revealed that solid tumours were more prevalent. However, the distribution of the cancer diseases among males and females before and after the war was different. This difference could be due to the change of environmental conditions, contamination and the periods and the ways of exposures to the depleted uranium weapons used by coalition forces against Iraq. The weapons used against the republican guard forces produced ionizing radiation leading to possible biological effects on the human being.. However, lung, larynx, lymphoma, bladder, skin, stomach, breast, uterus, leukemia, thyroid, and liver cancers were all observed and the incidence of the diseases after the war were elevated.

CONCLUSIONS

1. The increase in cases including all the regions of the governorate and they are less than the other southern governorates.
2. The cancer cases that had higher incidence were leukemia, lung cancer, Ca bladder, Ca larynx and Lymphoma for males and Ca breast

for females. This agrees with WHO publications and the results of international researches and studies on the impact of ionizing radiation. The increase in these types of cancer started to take place within few years after the aggression. While other types of cancer, such as Ca thyroid, needs more time to appear, 10-40 years after the exposure to radiation, according to WHO literature

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