

Impact of Depleted Uranium on Man and Environment in Iraq

An international scientific symposium on the use of Depleted Uranium and its impact on man and environment in Iraq was held in Baghdad between December 2-3, 1998.

Several Iraqi and international researchers attended the symposium, in which 11 researches were presented on the effects of the use of the radioactive weapon -Depleted Uranium (DU)- on human beings and their environment (soil, water, plants and animals). Most of these studies focussed on the investigation of the frequency and the pattern of cancer primarily in southern Iraq, and on the health implications for future generations in view of the high incidence of congenital deformities. Data on the relationship between the high incidence of cancer and DU explosions were also presented.

The researches were conducted under unfavourable conditions, and with the lack of necessary equipment and limited facilities because of the severe effects of more than eight years of sanctions. Besides, the complete isolation of Iraqi scientists from their counterparts outside Iraq, and the absence of recent periodicals made the work even more difficult.

However, Iraqi scientists managed to provide solid evidence for the causal relationship between the use of DU during the Gulf War and the high incidence of cancer and congenital deformations, particularly in southern Iraq.

It was moving to see cancer and Gulf War Syndrome patients of different nationalities, British, American and Iraqi, share their dreadful experience as both Gulf War participants and victims.

Papers Presented

In a research on the long-term effect of DU on the Iraqi environment in six selected regions in the south, plant and animal tissues, soil, and water samples were collected and analyzed. The presence of isotopes of U-238 series in over a third of the collected plant samples was confirmed, using Gamma spectrometric analysis. Some wild plant samples had high concentrations of radioactive elements with levels reaching up to three times the natural background. Average radioactive doses delivered to the population in the study area via inhalation, ingestion of meat and milk, and external exposure were measured for the period 1991-96. The dose delivered to infants and children under 15 years of age represented 70% of the total dose delivered to the general population. Calculations showed that in areas covered by the study, an estimated 845,000 tons of edible wild plants were

contaminated with radioactive materials and 31% of the animal resources in the area were exposed to radioactive contaminants.

Another study examined the frequency of incidence of cancer diseases as well as the distribution of different types of cancer among patients (males and females) in four hospitals in Mosul, the provincial capital of Nineveh, northern Iraq, before and after the Gulf War of 1991. Cancer diseases were recorded in these four hospitals from August 1989 to March 1990 and later from August 1997 to March 1998. The frequency of cancer cases increased five-fold, with lung, leukemia, breast, skin, lymphoma, and liver cancer being prevalent. The study revealed that solid tumours were more frequent. The distribution of the cancer diseases among males and females before and after the war was different, pointing to a new factor, namely the impact of the war, and probably the use of DU weapons. In 1996, one of the researchers reported a remarkable increase in Uranium concentration, especially in southern Muthanna and Thi-Qar provinces, where the Republican Guards were concentrated. Notably, before the war the prevalence of cancer diseases was, in decreasing order of frequency: lung, lymphoma, larynx, leukemia, and breast. After the war, in 1997-98, the order became: lung, lymphoma, breast, larynx, skin, and leukemia. A sharp increase was reported in the incidence of most of these types of cancer diseases: lung (five-fold), lymphoma (four-fold), breast (six-fold), larynx (four-fold), skin (eleven-fold). Among less prevalent cancer diseases, the increase is even sharper: uterus (nearly ten-fold), colon (six-fold), hyper-nephroma (seven-fold), malignant myeloma (sixteen-fold), liver (eleven-fold), ovaries (sixteen-fold), peri-anal (twenty-fold).

The results of an extensive epidemiological and clinical investigation covering military personnel (all males) who have been exposed to DU show clearly the radiological and chemically toxic effects of Uranium. The sample (1425 cases) involved Iraqi military personnel who participated in the war in southern Iraq. The study covered the period 1991-97, and the age group 19-50 years. The findings indicate a change in the pattern of different types of cancer as well as an overall increase in cancer, especially lymphoma, leukemia, lung, bone, brain, gastro-intestinal and liver cancers. The increase reached a maximum in 1996 and the majority of the cases (averaging 84% for the period 1993-97 as calculated from the paper's data) are among military personnel exposed to DU explosions (ascertained by personal interviews). One of the most important findings reported in this study is the difference in the pattern of cancer diseases between those exposed to DU explosions, compared to those who were not. The pattern among those exposed is: lymphoma (30%), leukemia (23%), lung (15%), brain (11%), gastro-intestinal (5%), testicular and bone (4% each), pancreatic (3%), liver and salivary gland (2% each). Among those not exposed, it is: lung (25%), gastro-intestinal (20%), leukemia (15%), lymphoma (14%), liver (10%), bone (9%), brain (7%). The order of prevalence has dramatically changed as a result of DU exposure. While lymphoma, leukemia, lung and brain cancers are prevalent

among the exposed, with frequency decreasing in the order indicated, lung, gastro-intestinal, leukemia and lymphoma are prevalent among those not exposed. The higher odd ratio signifies the close association between DU and cancer cases. This is particularly true for lymphomas (odd ratio 5.6), leukemia (4.8), and brain (4.5), which indicate DU as the causative agent for these types of cancer. There is a lesser degree of association for lung, gastro-intestinal, bone and liver cancers. The percentage of stillbirths, congenital anomalies, and secondary infertility in families of military participants exposed to DU are 1.9, 5.2 and 5.7, respectively. The paper quotes a 1995 U.S Army Environment Institute report and a 1997 Department of Veteran Affairs report that "DU has an effect on the shape of chromosomes in terms of increase in sister chromatid exchange". That was proven through lymphocyte culture of two groups of people working in Uranium manufacturing in the U.S. The probability is that DU has a chemically toxic and radiological effect resulting in infertility, congenital anomalies and low birth weight of babies of mothers and fathers exposed to DU. The study concludes that the extensive use of DU weapons, estimated at 630 tons, and the resulting dust and aerosol of Uranium Oxide caused extensive pollution to regions in south Iraq and neighbouring areas of Kuwait and Saudi Arabia. Transmission occurs indirectly through pollution of the environment: soil, plant, food, animal, surface and ground water.

Recommendations and Proposals

- Further exhaustive studies of health problems related to the use of DU during the 1991 War.
- Training doctors and enhancing needed equipment and advanced technology for cancer screening and treatment.
- Allowing collaboration with scientists from countries that were exposed to radiation from DU or other sources.
- Immediate clinical and epidemiological screening of all Iraqi citizens.