

DEPLETED URANIUM – “THE SILVER BULLET”

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SUMMARY. Article 35 of the Geneva protocols, signed by 150 countries in 1949 and an additional protocol signed from 1977 onwards prohibited the use of weapons that cause and inflict unnecessary injury and suffering. In the recent wars such as Bosnia, Kosovo and the Gulf War, more than 31,000 missiles were launched against enemy lines containing DU and more than 300 tonnes of DU during the Gulf War alone.

DU is a radioactive and toxic element. In humans it can cause lung cancer, damage to the liver and kidney affecting the bone marrow and consequently destroying stem cells that form the white cells resulting in mutations and the long lasting effect of genetic damage.

INTRODUCTION

I recently travelled to Far East India, Emirates and Pakistan to give lectures and practical demonstrations to the regional IAEA meeting on lymphobiopsy and lymphoscintigraphy utilising the gamma probe. From medical staff in the Kashmir and Afghanistan area (Figure 1) I learnt about the recent damage produced to genetic system utilising DU. New born babies are being born with genetic damage to the face, limbs and atrophied organs and in areas such as Iraq, where the West maintain sanctions in communication we are unaware that more than 100,000 individuals are currently reporting one way or another a type of cancer or genetic abnormality related to DU.

THEORY

Depleted Uranium is 1.7 denser than lead. The alloy prepared with Titanium forms a dense and hard penetrator but on impact, DU burns when piercing the



Figure 1. Surgeons working in Afghanistan.

target releasing uranium-oxide UO_2 or UO_3 . A radioactive aerosol insoluble in water which contains alpha particles is released. More than 60% of the alpha particles are less than 5 microns in diameter. Considering that our respiratory system will permit particles to enter up to 10 microns, they can be inhaled without producing any abnormality or any reaction to individuals. The ceramics of aerosol the form of uranium-oxide takes twice as long or about two year biological half-life in the lung, before passing into the blood stream.

Because of the natural biological defence mechanism of our body, large particles are normally coughed out of our lungs and the others excreted through the gastro-intestinal tract in faeces. Uranium is a heavy metal known to cause uranium nephritis.

Uranium-oxide in soil is about 1 to 3 parts per million, whereas in uranium ore it is about 1,000 times more concentrated, reaching about 0.05 to 0.2 percent of the total weight. Depleted uranium concentrate is almost 100 percent uranium. More than 99 percent of both natural and depleted uranium consists of the isotope U-238. One gram of pure U-238 has a specific activity of 12.4 kBq, which means there are 12,400 atomic transformations every second, each of which releases an energetic alpha particle. Uranium 238 has a half life of 4.51×10^9 , equivalent to 4,510,000,000 years).

Each atomic transformation produces another radioactive chemical: first, uranium 238 produces thorium 234, (which has a half life of 24.1 days), then the thorium 234 decays to protactinium 234 (which has a half life of 6.75 hours), and then protactinium decays to uranium 234 (which has a half life of 2.47×10^5 or 247,000 years). The first two decay radioisotopes together with the U 238 count for almost all of the radioactivity in the depleted uranium. Even after an industrial process which separates out the uranium 238 has taken place, it will continue to produce these other radionuclides. Within 3 to 6 months they will all be present in equilibrium balance. Therefore one must consider the array of radionuclides, not just uranium 238, when trying to understand what

happened when veterans inhaled depleted uranium in the Gulf War.

Leukaemia is the most common cancer related to DU spreading through the body via functions of other organs and disabling the immune system. It leads to a lack of platelets, causing headaches, gum bleeding and frequent bruising. DU because of its slow absorption to the lungs and the long retention in the body tissue, its primary damage will be due to its radiological damage to internal organs rather than chemical damage to the renal system (Figure 2). But we must understand that both type of damage occur simultaneously. The question is to which one produces more damage is yet to be investigated. DU also leads to a lack of white and red blood cells which protect against infection and anaemia.

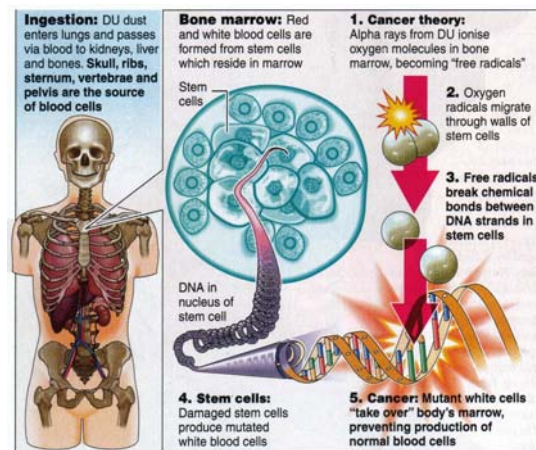


Figure 2. Biological effects of DU.

The aerosol produced on impact is able to travel by air over long distance contaminating surface water, air, flora and fauna and consequently the food chain.

Ammunition made of DU, was developed in the late 1970's as a response to the tanks developed by the

Soviet Union T-72 which were considered impenetrable.

DU shells were considered the wonder weapon to match the resistance of the adversary.

The Gulf war was the real test in the battlefield and clearly DU fulfilled the job by turning Iraqi armor units into “Swiss Cheese”. Unfortunately DU has left dangerous side effects, furthermore it has left radioactive equipment and polluted the surrounding environment. DU is considered nuclear waste, a by-product of uranium enrichment. The West has presently stockpiled DU in excess of 550 million kilograms. In the normal method of waste disposal, depleted uranium has been given away to Western Industry at no cost for the manufacture of both arms and ammunition. It will come as no surprise if in the future, Western armies become subjects of attack by this type of weapon.

NATO

NATO countries attend depleted uranium meeting at NATO headquarters on January 10, 2001.

Dr Harry Sharman, University of Waterloo who has conducted studies in DU usage, says “ NATO is trying to save Kosovo but if they leave Kosovo filled with DU it is not a happy situation. They will be allowing the poisoning of the environment for generations to come. If you are going to use DU in warfare it will be better to drop an atomic bomb and kill 30,000 people instantaneously rather than killing them over 20-30 years”.

REPORTS RELATED TO DU

From personnel being engaged or working in areas where ammunition containing DU has been exploded or utilised (Figures 3 and 4).



Figure 3. A-10 flight.



Figure 4. A-10 flight being loaded with DU bullets.

1. Eight Italian soldiers died of leukaemia after service in the Balkans.
2. Five Belgian soldiers die of cancer after service in Kosovo.
3. Four French soldiers terminally ill with leukaemia after serving in the Balkans
4. Several Dutch army personnel develop mysterious Blood Disorders.
5. The Netherlands discover several cases of lung cancer upon return from service in the Balkans.
6. Three Spanish soldiers currently undergoing treatment for lymphatic disorders.
7. Czech Republic report helicopter pilots dying of leukaemia directly

involved in the firing of DU weapons.

The list of cases is growing every day.

Portugal is currently screening about 10,000 army personnel who have recently returned from the Balkans trying to identify direct and indirect illness resulting from DU.

FUTURE PROBLEMS

The world is yet to see the real problem created by the implementation of a forbidden weapon. As refugees and migrants will seek asylum and refuge throughout Europe, USA, inclusive Australia and New Zealand (Figure 5), a considerable increase in unfamiliar illness will be seen which to today's date, data has not been collected. DU has a half life of 4.5 billion years, just when the West is talking of curing degenerative disease by repairing DNA which will bring billions of dollars to pharmaceutical companies and research organisations.

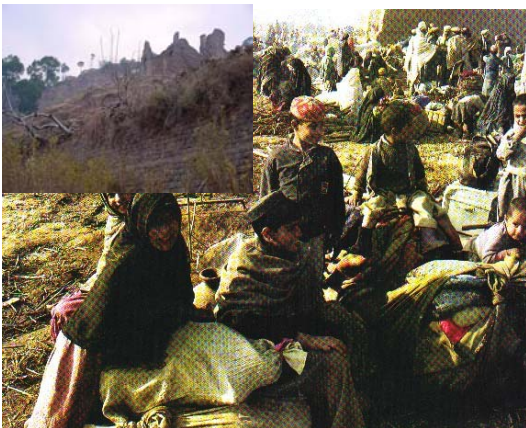


Figure 5. Effects of depleted uranium to environment and human beings.

SCREENING OF MILITARY PERSONNEL AND CIVILIANS OF THE PUBLIC

Testing of lymph nodes or bone on autopsy would be helpful (see Figure 6). However, invasive biopsies on live patients carry no benefit for the patient and are usually not recommended because of ethical considerations about experimentation on humans.



Figure 6. C.Munoz demonstrating lymphatic scanning techniques.

Whole body counting for uranium, using the sodium iodide or hyper pure germanium detectors, is designed to detect the isotope uranium 235, the isotope of uranium partially removed from depleted uranium. For lung counting, again it is the uranium 235 which is detected, and the minimum detection limit is about 7.4 Bq or 200 pCi. Since normally humans take in only 5 Bq per year, this is not a very sensitive measure. Seven or eight years after the Gulf War exposure, this method of detection is most likely useless for veterans.

CONCLUSION

Alternative to DU, non radioactive armorment can be developed utilising Tungsten but for that we will need to forget the cost and the profits.

Not forgetting that any war no matter how large or small will always be expensive to human life.

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