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Radioactive Fallout: Can Nutritional Supplements Help?

A Personal Viewpoint by Damien Downing, M.D.

(OMNS, May 10, 2011) The Fukushima nuclear accident has already been described as "the largest accidental release of radiation we have ever seen" [1], and it's not over yet.

Already, radioactive plutonium, strontium and iodine have reached the continental USA.

So should we worry? And, what can we do about it?

When the earthquake and tsunami hit north-east Japan on 11th March, it disabled all the multiple safety mechanisms at the Fukushima nuclear power plant. Fires started in three of the six reactors, and 24 hours later a large hydrogen explosion caused the collapse of part of the structure. From then on, radioactive material would have been released to the atmosphere. This is reasonable to assume, despite the usual assurances from the operators, TEPCO, and the Japan Atomic Energy Agency. Six days later, after all, traces of radioactive material were detected in Washington State [2] and then right down to California. This material can only have reached the USA by the airborne route.

Fukushima is now off the media map, replaced by dramatic political events. Contrast this with the coverage that was given to the Chernobyl disaster. Perhaps at that time there was a sense that the destruction of a nuclear power plant in the Ukraine was a metaphor for the failure of the Soviet Union. But Fukushima is, or will eventually prove to be, a far worse disaster. It is one that will be underplayed. The world is committed to nuclear power, and we will not be shown its true dangers. Do not expect to be told the whole truth when reading reassuring statements from industry or governments. Fukushima is affecting us all.

Radioactive elements released from Fukushima include plutonium, strontium, cesium and iodine. Ten days after the tsunami, Japanese scientists reported increased radioactive cesium and iodine in seawater offshore of Fukushima, and they rapidly reached levels "more than 1 million times higher than previously existed." [3] More serious radiation levels are likely in the USA when this polluted seawater reaches the west coast, which is estimated to take from 18 months to 3 years.

More serious? Why?

Because

- there will be radioactive elements that are ingested or absorbed by people, animals and plants
- they will biomagnify, concentrating up the food chain, as do all pollutants
- they won't go away; once inside us they will stay there

There are two different kinds of radiation: external, when you are exposed to radiation sources around you (the Fukushima clean-up workers are currently getting a lot of that), but which stops when you are no longer near the source; and internal, when a source of radiation gets into your body and stays there. This is much more serious because you are constantly exposed for much longer. Former Russian agent Alexander Litvinenko was killed in London that way in 2006 - by being given, probably swallowing in a beverage, some highly radioactive polonium. Traces of the same polonium were found on some airline seats, but nobody seems to have been harmed by sitting in them.

You may already have been exposed to (mostly-) depleted uranium back in 2003. Despite official denials, it does seem to be true that increases in uranium were detected in Berkshire, England nine days after the start of Shock and Awe [4]. To get there it must have traveled across the whole of the USA.

By the time it reaches the continental USA the radiation from Fukushima will be very spread out, so individual doses will be very small. But they will be on top of the radiation to which we are all exposed already: from X-rays, from flying at 30.000 feet, from radon in the ground, and on top of all our other toxic exposures such as mercury, pesticides and thousands of other chemicals. This is the "Who killed Julius Caesar?" phenomenon; the answer is at least 23 people, stabbing him at least 36 times. None of them could have been proved to have caused his death, but they all contributed to it. All the poisons to which we are exposed add up to harm us, too.

Epidemiologist Dr. Steven Wing makes the useful point that whether a dose of radiation is spread thickly across just a few thousand people, or much more thinly across tens of millions, around the same number of cancers will result. So although the increase in individual risk from Fukushima is likely to be tiny for any individual in the USA, it will still amount to a major public health problem.

- The Chernobyl nuclear disaster certainly caused thousands of premature deaths in a sweep across northern Europe, and may have caused more than a million deaths [5]. But Fukushima is worse in several ways;
- At Chernobyl there were only 180 tons of nuclear fuel on-site, whereas at Fukushima there are thousands of tons.
- Chernobyl is 250 miles from the nearest sea, but Fukushima is on the coast. Already the radiation released to sea from there is 10 to 100 times worse than Chernobyl.
- Chernobyl was sealed into a "sarcophagus," although too late to prevent some airborne release. Fukushima is and will likely continue releasing radiation into the sea for some time. Best case scenarios (from the nuclear industry, of course) are saying it will take nine months to shut the reactors down and seal them. Skeptics say that you truly cannot "seal" a reactor with concrete, because the radioactive material will then go downwards, into the soil and the water table, and end up in the sea anyway.

You may say; "Surely the government has this all in hand?" Well, the strange thing is that the EPA is set to revise its Protective Action Guides - the levels of radiation that it deems safe for us to be exposed to, from food, water, air or soil. Some of the upper limits are rising more than 1,000-fold, into the "will definitely give cancer to some people" zone. You can read more about this here [6], which also gives useful email addresses in case you want to express your views to the EPA. I know it looks like another one of "those" websites, but this is corroborated many times over elsewhere.

The European Union has moved fast to respond; on March 25 EU Regulation 297/2011 [7] came into force. Although this looks like a sensible precaution, requiring testing of foods from affected areas of Japan for radioactivity, it in fact introduces upper limits for radioactivity that are significantly higher than previous ones. Baffling.

What can you do?

For each radionuclide there is a different risk and a different set of measures. The US Department of Homeland Security funded a guidelines paper in 2006 [8].

Radioactive iodine-131 For this threat, we take regular iodine, to minimize the amount of the bad stuff that gets taken up by the thyroid. Various forms, such as potassium iodide, do work, but only if given before or within 12 hours of exposure. And, since I-131 has a half-life of 8 days, by the time it gets from Fukushima to the USA there won't be much radioactivity left. So don't worry about that one.

Uranium (half-life: thousands of years) is there in Fukushima in large quantities in the fuel rods. No reports of it being found in the environment yet, but there's plenty of time. And even depleted (non-radioactive) uranium is a highly toxic heavy metal, and one to which anybody who served in Gulf I or II, or in Bosnia or Kosovo, has probably been exposed. So a Fukushima exposure would just add to that toxicity. For uranium there are protocols worked out by the US military. Large doses of sodium bicarbonate (baking

soda, in the orange box) minimize the damage caused by uranium and encourage its excretion in the kidneys. You can buy bicarb in bulk for less than a dollar per pound. It is certainly worth stocking up on. You can absorb it through the skin, so a good fistful in a warm bath, which you sit in for 15-20 minutes, is the simplest way to take it in.

Cesium-137 has a half-life of 30 years, and like uranium is still a toxic metal even when not radioactive. The US government stockpiles the chemical Prussian Blue for removing cesium. [9] Prussian Blue is ferric ferrocyanide - Fe7(CN)18 plus a load of water. It is not absorbed from the gut; it can only trap cesium (and also thallium) as it is recycled through the bile to gut to blood again. It works by cutting the biological half-life (time to get rid of half the total body burden) from about 80 days to 25. But that would still take 3 months to bring the level below 10% of starting, which is plenty of time to do harm. Prussian Blue was used in photography before we went digital, so there might be some left in your garage. Leave it there and DO NOT try this at home. Prussian Blue contains cyanide, a strong poison.

Plutonium: When uranium is used in a reactor it converts to plutonium, which is a big worry. Plutonium is extremely dangerous. It is estimated that 1 gram could kill ten million people. This is what CDC has to say [10]:

Because it emits alpha particles, plutonium is most dangerous when inhaled. When plutonium particles are inhaled, they lodge in the lung tissue. The alpha particles can kill lung cells, which causes scarring of the lungs, leading to further lung disease and cancer. Plutonium can enter the blood stream from the lungs and travel to the kidneys, meaning that the blood and the kidneys will be exposed to alpha particles. Once plutonium circulates through the body, it concentrates in the bones, liver, and spleen, exposing these organs to alpha particles. Plutonium that is ingested from contaminated food or water does not pose a serious threat to humans because the stomach does not absorb plutonium easily and so it passes out of the body in the feces.

What can you do about it? There are no grounds for thinking iodine or bicarbonate will work. The medical recommendation at present is DTPA, which is a version of EDTA - a chelating agent, specific to transuranic elements.

In each of the above exposures, of course you should get to a doctor, fast, and get the appropriate treatment. But an exposure coming from Fukushima is likely to be a dirty mix of any or all of these, so we need some universal measures. There are three worthwhile ones, all of which you can do for yourself:

Antioxidant vitamins

It's easy to get down the health store and buy some bottles of these, and in these circumstances an overdose is the last thing to worry about. While the shelves are full of nutritional and herbal products that might help, my personal advice would be to take;

- Vitamin C (the body's main water-soluble antioxidant) approximately 3,000 to 5,000 milligrams, three times daily; option to combine water-soluble and oil-based forms.
- Vitamin E (the main fat-soluble antioxidant) mixed tocopherols and tocotrienols, around 400 IU, once daily.
- R Lipoic Acid (operates in both water and lipid compartments, spares both vitamins C and E) 100-plus mg, three times daily.

Glutathione

This amino acid is known to chelate certain minerals, but there's no evidence that it works on radioactive ones. Some experts say nothing does. However, it's a crucial antioxidant, which will protect against radiation damage and help to mop up the toxic molecules produced. Take loads; say 1,000 mg three times daily. And because it can be tricky to absorb, consider using the oil-based version that you rub into your skin.

Phosphatidylcholine

If you turned up in the ER in an eastern bloc country with acute radiation exposure, they would give you a IV shot of phosphatidylcholine. It is found in egg yolk, organ meats, and lecithin supplements and is easily absorbed into our membranes as a phospholipid. There are no human experiments I know of, thankfully, but this is backed up by some doctors:

Ionizing radiation first disturbs the phospholipid metabolism, then provokes severe inflammatory reactions, and finally leads to death.... The survival of rats exposed to lethal doses of radiation was clearly prolonged with phospholipid supplementation. [11]

You can get liquid or capsules; take at least a tablespoon or equivalent daily, with food.

If you've got the time, it's wise to build all of these up slowly, or they may give you loose bowels for a few days. If you haven't got the time, you have bigger things to worry about.

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