



WORLD BOOK ENCYCLOPEDIA SCIENCE SERVICE, INC.
516 TRAVIS STREET • HOUSTON 2, TEXAS • CA 4-6971

Slugline: RADIATION Part IVI

403471

Release Date: July 24, 1966

RADIATION -- AN ELUSIVE PERIL

Part IVI

Routine Exams Can Reveal Delayed Effects Of Radiation

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Routine examinations by a family doctor are the key to detection and correction of any delayed effects of low level radiation to which all Americans are being exposed.

A continuing study of south sea islanders exposed to heavy fallout from a hydrogen bomb test in 1954 reveals that exposure to radiation can stunt children's growth and produce thyroid abnormalities. Simple techniques available to any doctor can be used to check for these effects in people exposed to fallout from nuclear testing and radioactivity from coal burning industrial plants and naturally radioactive rocks and water.

Only a tape measure and carefully kept records are needed to

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check height and supply the statistics needed to determine deviations in the growth rates of children. Doctors can detect lumps on the thyroid gland simply by feeling the neck. Routine blood tests provide a third major measure to evaluate radiation exposure.

The inhabitants of the Marshall Islands were irradiated when a shift in winds caused unexpectedly large amounts of fallout from a powerful thermonuclear explosion on Bikini to be deposited on four of the islands. The 23 crew members of the Japanese fishing boat Fortunate Dragon and 267 islanders were caught in the radioactive rain.

The inhabitants of Rongelap Island, 118 miles away from the blast, received the greatest fallout exposure. They experienced nausea, diarrhea, loss of appetite and, later, skin burns, spotty loss of hair and discoloration of skin and nails. The people were evacuated from Rongelap and virtually all of these immediate effects disappeared within six months.

It is this group of 82 people that is being examined by U.S. doctors every year in order to detect and treat any late effects of their exposure. Every year a pediatrician checks the children and other specialists take turns supplementing the general examinations of children and adults.

The most startling result found is that boys who were under 8 years of age at the time of irradiation have not grown as tall as those

who were unexposed. Four out of four boys examined in this age group show a retardation of growth and bone development.

There is no discrepancy in weight between the two groups, but the exposed boys are shorter, heavier and more bull chested. They would make better guards on the Rongelap football squad.

Complicating the picture is the astonishing fact that girls exposed to fallout at the same age are not affected. This is extremely puzzling since children under 8 have no functional gonads; therefore, no sexual differences are presumed to exist between them.

At puberty the exposed boys are about seven months behind the unexposed in height and bone development. Otherwise, they are smart, bright normal kids. From this, we tentatively conclude that the boys were particularly vulnerable to radiation at this age and that the resulting slowdown in bone development retarded growth.

All 19 children examined on Rongelap in 1964 showed thyroid gland abnormalities. In fact, every child under 16 years of age at the time of exposure has something wrong with his or her thyroid. These abnormalities can be caused by radioactive iodine which is taken into the body with contaminated food and concentrated in the thyroid.

Radiation to the thyroid can reduce the amount of hormone secreted by this gland. The reduction in turn may retard bone development and result in failure to achieve normal height. Studies of the

Marshall Island children indicate that radiation may also directly affect the bones and retard growth by this mechanism. However, the two effects are easy to separate because those with hypothyroidism are sluggish and non-responsive, while the others are bright, smart and active.

Changes in the thyroid induced by radiation also may be a significant factor in delaying puberty. Several cases of late menstruation were found among Marshall island girls exposed to fallout.

The most frequent abnormality is the presence of lumps on the thyroid. Evidence is strong that these nodules were induced by radiation. The lumps themselves are not dangerous, but they are a warning sign of changes that may develop into malignancies. Evidence of such malignancies has appeared in five cases and three Marshallese girls have had their thyroids removed.

People in Nevada and Utah have been exposed to fallout since the 1950's, first from tests in the atmosphere and now from radioactivity that accidentally escapes from underground tests.

Seventy children with thyroid nodules have been found in Washington County, Utah, and 25 more in Graham County, Arizona, as a result of examinations conducted last year. Those in Utah have been exposed to presumably significant amounts of fallout from U.S. nuclear tests since 1954; those in Arizona have not. According to the

Public Health Service, three thyroid experts are restudying 3,600 children in the two communities in order "to further evaluate the status of thyroid abnormalities in the two groups."

Further medical screening of the 95 students with nodules has turned up 12 children with inflamed thyroids. The inflammation (thyroiditis) was definitely diagnosed in five Utah children and is strongly suspected in at least four other Utah cases. Only three cases have been found in Arizona, and two lived in areas that may have received fallout.

These 12 cases are extremely important. Studies of the Marshallese have shown that no population is too small to be investigated when it is exposed to radiation. Marked changes occurring in a very small group can tip us off to unsuspected or overlooked effects in large populations.

Since A-bombs were dropped on Hiroshima and Nagasaki in 1945, the Atomic Bomb Casualty Commission has studied some 100,000 people in these cities and found a slight decrease in height among the Japanese exposed to radiation. This was not thought to be of any particular significance until the Marshall Islands study showed a definite decrease in height, presumably from radiation.

The ABCC is now re-examining its medical data by age and sex groups. This re-examination may confirm that retardation of the height of boys under 8 years at time of exposure is a common long-

term effect of radiation. It also may establish the amount of radiation that causes such retardation and reveal why the boys were affected but not the girls.

If we assembled the same information about people in Nevada and Utah, it would be possible to determine if their growth has been affected by this fallout. The information is there, but someone has to get it together.

This does not require expensive surveys conducted by specialists using complex instruments. As I stated before, it can be done with simple tools available to any doctor and as a part of examinations that are conducted routinely. When routine checking reveals deviations from normal, then expert help can be sought to determine the significance of the deviation.

This is essentially what has been done in the Utah-Arizona study. Local doctors and health officers examined 3,600 children. Then three thyroid specialists conducted more detailed examinations of the 95 suspicious cases that were found.

Even so, the interpretation of the examination results remain ambiguous. We probably have enough information available in the records of school children to clear up the ambiguity, but the information is not accessible. It is not in one place, and it is not labeled.

One of the first things a pediatrician does is check the weight and height of children. Such data properly tabulated would enable us to spot any deviations in the average growth of a group.

However, a great many individuals must be measured for these statistics to be useful. Since the risk to an individual of developing leukemia or bone cancer from radiation is very small, we should check at least a million people. Actually about ten million would have to be examined to get the information in a reasonable time.

The risk to children of parents who have been exposed is so very small, that millions of children of the next generation would have to be examined to determine what effect low-level radiation absorbed by their parents had on the physical and mental health of the children.

These monitoring techniques should not be restricted to communities experiencing worrisome fallout from nuclear tests. They should be applied to places where water has a high radium content, to communities excessively exposed to radioactive coal smoke, and to localities where natural radiation from rocks is unusually high. In order to establish what is normal the techniques also must be applied in communities where radiation from all sources is low.

The only practical way to monitor all these people is by utilizing routine checkups and carefully recording the data. The family doctor gets the information needed, so there is no need to obtain it again.

we must provide a central place, where he can report his information and where it's accessible to experts.

We must do this soon if we are to replace the fear and uncertainty of an elusive peril with realistic safety limits and controls.

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