

Neth, Rolf-Dietmar

## **Childhood Leukemia in the Collective Municipality of Elbmarsch: A Plea for Factual Argumentation**

POLITICS



The nuclear power plant Krümmel and leukemia cases in children: According to information provided by the Federal Office for Radiation Protection, several factors in combination may contribute to an increased risk of developing cancer. Photo: Keystone.

The renewed incident at the nuclear power plant in Krümmel has given new life to the debate concerning the cause of childhood leukemia in northern Germany.

It was a spectacular operation on 11 July as about 100 anti-nuclear activists from boats on the Elbe river sank 19 stones in the cooling water intake of the nuclear power plant in Krümmel to demand the immediate shut down of the “leukemia reactor”. According to Bernd Ebeling of the Citizens Initiative Against Nuclear Power Plants in Uelzen, each stone stands for one of the 19 unexplained cases of leukemia in Elbmarsch.

It has been consistently maintained for many years that the proportion of children who live near nuclear power plants becoming ill with leukemia is significantly higher than elsewhere. It is a fact that acute lymphocytic leukemia (ALL) is the most frequently occurring cancer in children. Between 1990 and 2000, 16 children who live near Geesthacht/Krümmel have developed leukemia. Statistically 5.6 cases would have been expected (information from the German Childhood Cancer Registry).

The clinical presentation of leukemia is heterogeneous, age-dependent and is determined by multifactorial causes. In animal experiments it is possible to induce leukemia with ionizing radiation, various chemicals and with viruses (human T-cell leukemia virus, herpes viruses). In cats, cattle and chickens leukemia can be caused by retroviruses. Studies conducted throughout the world have shown that the same risk factors apply to humans.

A causal relationship between ionizing radiation at doses exceeding 200 mSv and leukemia has been scientifically confirmed in many studies. This confirmation of causality is absent for low doses of radiation (10 mSv and less), for electromagnetic fields and chemicals (pesticides, cigarettes). In epidemiological studies concerning the effects of radiation disagreements arise

when only low exposure values can be determined. This holds true for all “low-dose studies” (e.g., Sellafield, La Hague nuclear power plants).

Accumulations of leukemia cases that are limited both in time and location – especially ALL of childhood – are called leukemia clusters. Of the 240 leukemia clusters that were detected during the Euroclis study conducted in 17 countries and which included a total of 13 551 cases of childhood leukemia, only four were located near nuclear power plants (1, 2). This confirmed that demographic factors are more likely to be associated with the occurrence of leukemia clusters than environmental factors such as nuclear power plants (2), military airports (3) and other postulated causes geared towards the media – such as pesticides and electrosmog (2, 4).

In contrast to this the demographic facts exhibited differences. Typical for clusters were residential areas in which isolated inhabitants were joined by new inhabitants from other residential areas.

Population densities between 250 to 500 and 500 to 750 per square kilometer are especially susceptible to epidemics. A relationship between childhood leukemia clusters and microepidemics of so far unknown pathogens is possible. The results of the Euroclis study show that leukemia clusters must be viewed in relationship with the etiology and biology of childhood leukemia. It is much more likely for ALL that childhood infections play a role as initiating risk factors.

Children, who in early childhood were protected against infections (“immunological isolation”), when exposed at a later time respond to pathogens with an especially strong immune response. This induces an increased proliferation of lymphoid precursor cells. Leukemoid precursor cells of lymphopoiesis when compared with normal lymphocytes and their precursors could have a proliferation advantage in infections that causes ALL. The age peak of ALL between the second and fourth year of life could be explained by the frequently occurring infections at this age.

The diagnosis of leukemia is a devastating experience for the parents and relatives of the sick child. Naturally, every known cause must be ruled out. Today, fortunately more than 80 % of children afflicted with ALL can be successfully treated: In the Department of Pediatric Hematology and Oncology of the University Hospital Hamburg-Eppendorf 14 children with ALL have been treated during the past 15 years. Of these, 13 are in full remission (in other words healed); one child has died. Additionally, two children with acute myeloid leukemia (AML) have been treated; both are still living (one child after a bone marrow transplant). After atomic bombs were dropped on Hiroshima and Nagasaki, 61 cases of leukemia were diagnosed in individuals up to 19 years old. Of these, 14 were ALL and 42 were AML cases. In contrast to Krümmel (14 ALL to 2 AML), the ratio of ALL to AML speaks for a radioactive cause (5).

Politicians have awarded millions of Euros for leukemia studies without providing for responsible accompanying scientific panels. Thus, Krümmel has become a prime example of what happens when experience (led by political interests), beliefs and feelings are the motivating force of scientific investigations (6). Not until the leukemia and lymphoma study in northern Germany was an accompanying scientific panel employed. The result: “The nuclear power plant Krümmel is ruled out as a cause of the leukemia cluster in Elbmarsch”. But the final report states: “The cause of the leukemia cluster in Elbmarsch is unknown”. This has opened the floodgates not only for demanding new expert opinions, but also for the financing of relocation measures.

All scientists, politicians and the media should inform honestly and act sincerely. For example, factual information is required in Great Britain by means of special financing programs

(Leukemia Research Fund, Kay Kendall Leukemia Fund). Only in this way was it possible for Melvin Greaves to compile an overview of 143 conscientiously critiqued articles (7). Such an undertaking could be the basis for a factual discussion of the topic leukemia by the Bundestag, after a more than a 20-year “dispute about causal relationships”.

Prof. Dr. Rolf-Dietmar Neth

As a pediatrician and hematologist, Prof. Dr. Rolf-Dietmar Neth was the managing director of the Department of Clinical Chemistry at the University Hospital Hamburg-Eppendorf. He is the initiator of the renowned Wilsede Meetings ([www.science-connections.com](http://www.science-connections.com)). As a pediatrician, he has personally experienced the suffering of children with ALL and that of their relatives. During the past 40 years, he has been focused on scientifically studying leukemia.

Medical literature on the Internet:

[www.aerzteblatt.de/lit3009](http://www.aerzteblatt.de/lit3009)