

Dear chairman, dear co-workers.

First of all, I would like to thank the organizer of this very important symposium dedicated to 30 years of anniversary of NASHIM program, for inviting me and giving me possibility to bring to table, my personal experience related to the importance of the international cooperation between Japan and Belarus in management of medical consequences of Chernobyl and Fukushima accidents.

I was very lucky in the summer of 2005 to become a participant of the NASHIM program, and I can visit in department of Professor Shunichi Yamashita in Nagasaki University.

It's really, salute and unbelievable and I have a good memory for me.

Nagasaki is fantastic city, city of the sparkling sea, modern construction and building and ancient temples, mixtures of different cultures.

In the same time, it's the real Japanese city where living are very polite, hardworking and nice people, which like to organize festival and fireworks.

It was my first impression about Nagasaki.

People of Nagasaki have a special understanding of a word "peace," and apply many efforts that has not repeated on August 9th, 1945.

People of Nagasaki 30 years support activity "NASHIM".

It is remarkable school and an opportunity for many people from different countries to improve the knowledge in the various areas of radiation medicine, it is better way to learn the lifestyle of Japan and to like this country for forever.

Now it is well known that the most significant well-documented health consequence of the Chernobyl accident in Belarus, Ukraine, and the Russian Federation is dramatic increase in the incidence of thyroid cancer in individuals exposed to ionizing radiation in childhood.

However in the beginning of nineties in Belarus, there were not enough specialists in the field of radiation medicine, in early diagnosis of thyroid cancer and in general in the ultrasound diagnosis.

Belarusian scientists and doctors needed the assistance of more experienced professionals.

The first who gave their hand of help were Professor Yamashita and his Japanese colleagues.

He and his colleagues came to Belarus and visited the most contaminated areas.

Professor Yamashita personally evaluated the situation and suggested the most effective activities for screening and mitigation of medical consequences of the Chernobyl accident.

In April of 1992, the Nagasaki Association of Hibakusha's Medical Care (NASHIM) was established.

Nagasaki University together with NASHIM program have been working for above 30 years to educate specialists from the abroad, including those who were from Belarus.

NASHIM holds lectures to enlighten significance and necessity of the international cooperation of Hibakusha's (radiation victims) medical care.

Furthermore, NASHIM promotes publicity work and information offering.

Mitigation of consequences of Chernobyl accident essentially involves international cooperation.

What means international cooperation with Japan? Between Japan and Belarus.

The first of all, there is the radiological education and also there is a lot of direction related to development of the new approaches to the diagnosis and therapy of radiation-induced thyroid diseases, in the first line of thyroid disease.

First reports about the abnormal increase in the number of thyroid cancer cases in children in Belarus was published by Kazakov in 1992 in the Nature and by Drozd in 1993 related to screening of problem and very high prevalence children thyroid cancer among radiation exposed population.

Professor Yamashita and professor Takamura from Nagasaki University are paying a lot of attention for the international educational programs.

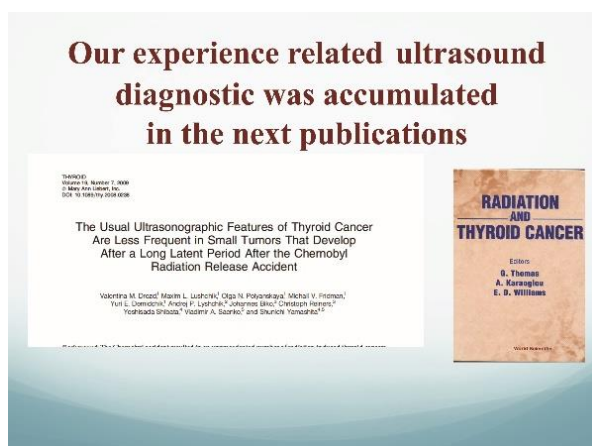
In Belarus, many scientists and doctors could be trained in the programs of NASHIM and significantly expand their knowledge on radiation medicine.

After that, they can use this experience in Belarus for improve the treatment and medical care for radiation-exposed people.

Under the supervision of Professor Yamashita grown international group of young scientists, which is very productive in developing new research directions.

Scientific group of Professor Yamashita included Belarusian scientists received evidence for genetic predisposition to papillary thyroid carcinoma, both in irradiated and not irradiated population.

We hope that the cooperation between Belarus and Japan's scientists will continue and we will grow and benefit the world of science.



Our experiences from our joint project were accumulated in different publications.

And for the last 30 years, we published a lot of articles in different journals in different contexts.

For example, our experience related to the ultrasound diagnosis was accumulated in the article named "The Usual Ultrasonographic Features of Thyroid Cancer Are Less Frequent in Small Tumors That Develop After a Long Latent Period After the Chernobyl Radiation Release Accident".

This article was published in 2009 in the Journal of American

Thyroid Association, Thyroid.

Also our data published in Chapter the book "Radiation and Thyroid Cancer", edited by professor Gerry Thomas and professor Williams.

Related evidence for genetic predisposition to papillary thyroid carcinoma

Human Molecular Genetics, 2010, Vol. 19, No. 12 2516–2521
doi:10.1093/hmg/ddq122
Advance Access published on March 29, 2010

The *FOXE1* locus is a major genetic determinant for radiation-related thyroid carcinoma in Chernobyl

Meiko Takahashi^{1,2,3}, Vladimir A. Saenko^{3,4}, Tatiana I. Rogounovitch⁴, Takahisa Kawaguchi^{1,2},
Valentina M. Drozd⁵, Hisako Takigawa-Imamura¹, Natalia M. Akulevich⁴,
Chanavee Ratanajaraya¹, Norisato Mitsutake⁶, Noboru Takamura⁷, Larisa I. Danilova⁸,
Maxim L. Lushchik⁹, Yuri E. Demidchik¹, Simon Heath¹⁰, Ryo Yamada¹, Mark Lathrop¹¹,
Fumihiko Matsuda^{1,2,*} and Shunichi Yamashita^{1,2}

¹Center for Genomic Medicine and ²Institut National de la Santé et de la Recherche Médicale (INSERM) Unit U852, Kyoto University Graduate School of Medicine, Kyoto 606-8501, Japan, ³Department of International Health and Radiation Research and ⁴Department of Molecular Medicine, Atomic Bomb Disease Institute, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki 852-8523, Japan, ⁵Department of Thyroid Disease Research, ⁶Department of Endocrinology and ⁷Belarusian Medical Academy for Postgraduate Education, Minsk 220015, Republic of Belarus, ⁸Centre National de Génotypage, Institut Génomique, Commissariat à l'Énergie Atomique, Evry 91000, France and ⁹Fondation Jean Dausset-CEPH, Paris 75010, France

Received January 18, 2010; Revised and Accepted March 17, 2010

© 2010 Oxford University Press. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/2.0/>).

Related evidence for genetic predisposition to papillary thyroid cancer: the published article is "The *FOXE1* locus is a major genetic determinant for radiation-related thyroid carcinoma in Chernobyl".

This article was published in *Human Molecular Genetics* in 2010.

Journal of Radiation Research, Vol. 62, No. 6, 2021, pp. 982–998
<https://doi.org/10.1093/jrr/rrab012>
Advance Access Publication: 17 September 2021

Journal of
Radiation
Research
OXFORD

Thyroid dose estimates for the genome-wide association study of thyroid cancer in persons exposed in Belarus to ¹³¹I after the Chernobyl accident

Vladimir Drozdovitch^{1,*}, Victor Minenko², Tatiana Kukhta³, Kiryl Viarenich²,
Sergey Trofimik², Tatiana Rogounovitch⁴, Takafumi Nakayama⁵,
Valentina Drozd⁶, Ilya Veyalkin⁷, Norisato Mitsutake⁴,
Evgenia Ostroumova⁸ and Vladimir Saenko⁹

¹Division of Cancer Epidemiology and Genetics, National Cancer Institute, NIH, DHHS, Bethesda, MD 20892, USA

²Institute for Nuclear Problems, Belarusian State University, Minsk, 220030, Belarus

³United Institute of Informatics Problems, National Academy of Sciences of Belarus, Minsk, 220012, Belarus

⁴Department of Radiation Medical Sciences, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki, 852-8523, Japan

⁵Department of Molecular Medicine, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki, 852-8523, Japan

⁶The International Fund "Help for Patients with Radiation-Induced Thyroid Cancer (Anika)", Minsk, 220005, Belarus

⁷Republican Research Center for Radiation Medicine and Human Ecology, Gomel, 246030, Belarus

⁸International Agency for Research on Cancer, WHO, 69371, rue CFDFX 08, France

⁹Department of Radiation Molecular Epidemiology, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki, 852-8523, Japan

*Corresponding author. Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institutes of Health, DHHS, 9639 Medical Center

Also in this issue, recently was published the article, "Thyroid dose estimates for the genome-wide association study of thyroid cancer in persons exposed in Belarus to ¹³¹I after the Chernobyl accident."

This is the article published by a very international team from Japan, Belarus, the United States, and also the Russian Federation.

Related management of thyroid cancer in children exposed to radiation

THYROID CANCER AND NUCLEAR ACCIDENTS LONG-TERM AFTEREFFECTS OF CHERNOBYL AND FUKUSHIMA

Edited by
SHUNICHI YAMASHITA
GERRY THOMAS



Our experience related to management of thyroid cancer in children exposed to radiation published the chapter in the book edited by Shunichi Yamashita and Gerry Thomas, "Thyroid Cancer and Nuclear Accidents: Long Term Aftereffects of Chernobyl and Fukushima".

ORIGINAL

Bone mineral density in treated at a young age for differentiated thyroid cancer after Chernobyl female patients on TSH-suppressive therapy receiving or not Calcium-D3 supplementation

Tatiana A. Leonova¹, Valentina M. Drozd², Vladimir A. Saenko³, Mariko Mine⁴, Johannes Biko⁵, Tatiana I. Rogounovitch⁶, Noboru Takamura⁶, Christoph Reiners⁵ and Shunichi Yamashita^{3,7}

¹ Consulting diagnosis, Department of thyroid diseases, Minsk City Clinical Oncologic Dispensary, Minsk, 220013, Belarus
² Department of Endocrinology, Belarusian Medical Academy of Post-graduate Education, Minsk, 220013, Belarus
³ Department of Health Risk Control, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki 852-8523, Japan
⁴ Biostatistics Section, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki 852-8523, Japan
⁵ Department of Nuclear Medicine, University of Würzburg, Würzburg D-97080, Germany
⁶ Department of Global Health, Medicine and Health, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki 852-8523, Japan
⁷ Department of Radiation Medical Sciences, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki 852-8523, Japan



Also related to clinical features of the radiation-induced thyroid cancer, was published the article in the Endocrine Journal 2015, the name is "Bone mineral density in treated at a young age for differentiated thyroid cancer after Chernobyl female patients on TSH-suppressive therapy receiving or not receiving Calcium-D3 supplementation".

Related influence on induction of thyroid cancer by combined exposure to radiation and nitrates



Drozd, VM.; Saenko, VA.; Brenner, AV.; Drozdovitch, V.; Pashkevich, VI.; Kudelsky, AV.; Demidchik, YE.; Branovan, I.; Shiglik, N.; Rogounovitch, TI.; et al. Major Factors Affecting Incidence of Childhood Thyroid Cancer in Belarus after the Chernobyl Accident: Do Nitrates in Drinking Water Play a Role? PLoS ONE 2015, 10, e0137226.
➤ in Belarus have shown that radiation dose was significantly associated with thyroid cancer incidence (P=0.029). Effect of radiation significantly varied according to nitrate concentration in drinking water (P=0.004). In this way nitrate content in drinking water may affect the rates of thyroid cancer in irradiated populations.

Very important direction of our joint investigation with Japanese scientists was searching the reason not on the radiation but other risk factor searching the real effect of other risk factors.

On this issue, we published the article, "Major Factors Affecting Incidence of Childhood Thyroid Cancer in Belarus after the Chernobyl Accident: Do Nitrates in Drinking Water Play a Role? This article was published in the journal PLoS ONE in 2015.

In this article, we demonstrated as not only dose plays a very important role in the induction of thyroid cancer, but also add nitrate is a very important factor for induction of thyroid cancer.

It is like the both factors combined, are playing very important role.

Related to screening and prevalence of thyroid cancer in FUKUSHIMA



Int. J. Environ. Res. Public Health 2021, 18, 3444. <https://doi.org/10.3390/ijerph18073444>
<https://www.mdpi.com/journal/ijerph>

Roughly 80% of the Fukushima cases presented with tumor stages higher than microcarcinomas pT1a and 80% with lymph node metastases pN1. Those cases considered to be clinically relevant should be followed-up carefully after treatment because of the risk of recurrences which is expected to be not negligible. Considering that thyroid doses from the Fukushima accident were quite small, it makes sense to assess the role of other environmental and lifestyle-related factors in thyroid carcinogenesis. Well-designed studies with assessment of radiation doses from medical procedures and exposure to confounders/modifiers from the environment as e.g., nitrate are required to clarify their combined effect on thyroid cancer risk.

Related to screening and prevalence of thyroid cancer in Fukushima, we published the article, "A Search for Causes of Rising Incidence of Differentiated Thyroid Cancer in Children and Adolescents after Chernobyl and Fukushima: Comparison of the Clinical Features and Their Relevance for Treatment and Prognosis".

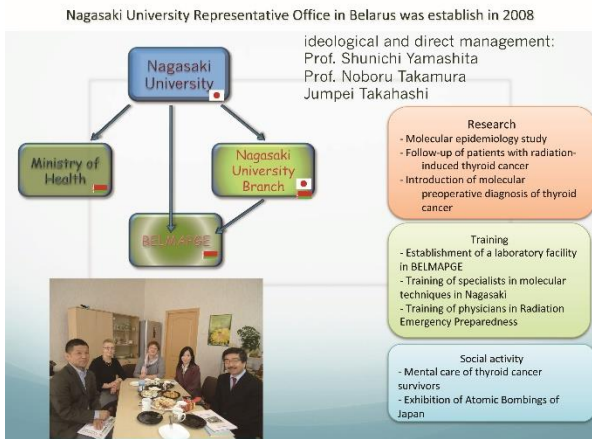
This article was published recently in the International Journal of Environmental Research and Public Health.

In this article, we proved that Fukushima thyroid cancer, even when diagnosed by screening, we reviewed in the not very early

stage about 80% of the cases were the clinically significant cases with lymph node metastases and microcarcinomas more than stage pT1.

That means not only radiation doses in Fukushima was very small and other lifestyle or environmental risk factors are playing a very important role in induction of thyroid cancer.

It's a field very open for our investigation, joint investigation with Japanese scientists to find the answer for a very important question of why thyroid cancer is growing in the world so quickly.



A very important direction of our cooperation with Japanese is the support of Nagasaki University representative office in Belarus.

This office was established in 2008, and is working on sustainment on the ideological and direct management of Professor Shunichi Yamashita, Professor Noboru Takamura, and Jumpei Takahashi.

The most important research direction supported by this office is the molecular epidemiology study, follow-up of patients with radiation-induced thyroid cancer or thyroid

diseases, introduction of molecular preoperative diagnosis of thyroid cancer.

Also very important part is the training program, and the establishment of a laboratory facility in Belarusian Medical Academy of Post-Graduate Education (BelMAPGE), a training program of specialists in molecular techniques in Nagasaki, training of physicians in Radiation Emergency Preparedness.

Also very important is the social activity, is the mental care, support of patients of thyroid disease and thyroid cancer survivors, establishment of a new method for support the survivors after thyroid cancer.



I would like to demonstrate the Registration Certificate of Nagasaki University Representative Office which gives us possibility to work legally in Belarus.



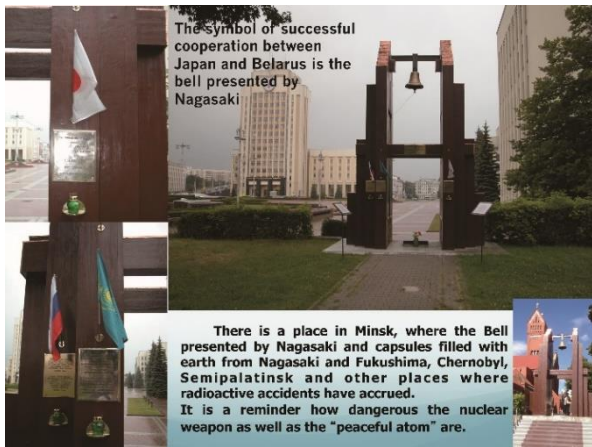
Very important is the last ten years, the direction of international cooperation.

It's the cooperation with Fukushima prefecture and Fukushima medical high school.

Under the umbrella of the IAEA and WHO, with the involvement of international experts, a lot of conferences were organized in Fukushima to develop optimal approaches to minimizing and mitigation of the consequences of the Fukushima accident.

On the slide, you can see the participants of the conference in

Fukushima Medical High School in 2016.



To finish my presentation, I would like to demonstrate this place in Minsk, you can see the symbol of the successful cooperation between Japan and Belarus.

It is the bell presented by Nagasaki.

Also in this place, there are capsules filled with earth from Nagasaki and Fukushima, Chernobyl, Semipalatinsk and other places where radioactive accidents have accrued.

It is a reminder how dangerous sometimes the nuclear, even the "peaceful atom" are, and how important the cooperation to prevent and in some cases to support others in the case of nuclear

accidents.

Thank you very much for your attention and I hope that our cooperation, international cooperation will continue to really be very successful and to give new knowledge for world's science.

Thank you very much.

