The 3rd International Symposium of Training Plan for Oncology Professionals

February 7 (Sat), 8 (Sun), 2015
Sheraton Miyako Hotel Osaka “Main Hall Naniwa-no-Ma”
6-1-55, Uehommachi, Tennoji-ku, Osaka 543-0001, JAPAN
http://www.miyakohotels.ne.jp/osaka/english/

Hosted by Training Plan for Oncology Professionals
in cooperation with Kinki Promotion Network for Clinical Oncology and Chugai Pharmaceutical Co., Ltd.
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Opening Ceremony  ▶ 11:00 – 11:10
Moderator
Toshio Shimizu, M.D., Tsutom Iwasa, M.D., Takeshi Yoshida, M.D.
(Department of Medical Oncology, Kinki University Faculty of Medicine)

Opening Remark
Masayuki Iki, M.D (Dean, Kinki University Faculty of Medicine)

Introduction
Kazuhiko Nakagawa, M.D.
(Professor, Department of Medical Oncology, Kinki University Faculty of Medicine)

Keynote Lecture  ▶ 11:10 – 12:10
Chair: Kazuhiko Nakagawa, M.D.
(Professor, Department of Medical Oncology, Kinki University Faculty of Medicine)
James Chih-Hsin Yang, M.D. (Professor, National Taiwan University Hospital, Taipei, Taiwan)

Molecular Targeted Therapy Trials: Current Status and Issues

Session 1  Hematological Oncology  ▶ 13:00 – 13:50
Chair persons: Shosaku Nomura, M.D. (Kansai Medical University) Hirohisa Nakamae, M.D., Ph.D. (Osaka City University)
Satoru Nanno, M.D. (Osaka City University) Sung Yong Oh, M.D. (Dong-A University Hospital, Busan, Korea)
Masaaki Hotta, M.D. (Kansai Medical University)

Session 2  Gastrointestinal Oncology  ▶ 13:50 – 14:25
Chair persons: Yung-Jue Bang, M.D. (Seoul National University) Nariaki Matsuura, M.D., Ph.D (Osaka University)
Yoshikane Nonagase, M.D. (Kinki University) Yaewon Yang, M.D. (Seoul National University, Seoul, Korea)

Session 3  Clinical Pharmacists in Oncology Practice  ▶ 14:40 – 15:30
Chair persons: Midori Hirai, Ph.D (Kobe University) Tomohiro Terada, Ph.D. (Shiga University of Medical Science Hospital)
Yasuhiro Kidera, Ph.D. (Kinki University)
Anthony J. Perissinotti, PharmD, BCOP (University of Michigan Health System, Ann Arbor, MI, USA)
Hiromi ii, Ph.D. (Kyoto Pharmaceutical University)

Session 4  Oncology Nursing / Palliative Care -1  ▶ 15:30 – 16:05
Chair persons: Sizue Suzuki, RN (Kobe City College of Nursing)
Ikuko Komo, MSN, CNS, RN, AOCNS, ANP-BC (Stanford University Medical Center, Palo Alto, CA, USA)
Jung-Tzu Hsu, RN (National Taiwan University Hospital, Taipei, Taiwan) Akiko Hanai, OTR (Kyoto University)

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Poster Viewing  ▶ 16:05 – 16:35 Poster Discussion-1  ▶ 16:35 – 17:25
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Maiko Niki (Kansai Medical University Hirakata Hospital) Takahiko Nakamura (Osaka Medical College)

Poster-2  Developmental Therapeutics/Translational Research  ▶ 16:55 – 17:25
Chair persons: Toru Mukohara, M.D. (Kobe University) Toshio Shimizu, M.D. (Kinki University)
Tsutom Sakiyama (Kinki University) Hiroaki Shichiri (Kobe University)
Kengo Matsumura (Kyoto Pharmaceutical University)

Poster-3  Radiation Oncology  ▶ 16:35 – 17:15
Chair persons: Yasumasa Nishimura, M.D. (Kinki University) Ryohei Sasaki, M.D. (Kobe University)
Eiichiro Okazaki (Osaka City University) Yasuhiro Shinohara (Osaka University)
Seiichi Ota (Kinki University) Yutaka Toyomasu (Mie University)
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Poster 4  Oncology Nursing  9:00 – 9:50
Chair persons: Kyoko Tanaka, RN, Ph.D. (Osaka Prefecture University)  Fumiko Koyama, RN (Kinki University)
Rie Hori (Kobe City College of Nursing)  Sena Yamamoto (Osaka University)
Ayumi Takao (Japan Community Health care Organization Osaka Hospital)
Naomi Fujikawa (Isikawa Prefectural Central Hospital)  Namiki Kitada (Osaka City General Hospital)

Poster 5  Supportive care / Pharmacology in Cancer Treatment  9:00 – 9:30
Chair persons: Tatsuya Ioka, M.D. (Osaka Medical Center)  Junji Tsurutani, M.D. (Kinki University)
Ami Tabata (Kyoto University)  Ken Asaishi (Osaka Medical College)  Chiyo Yamamoto (Kobe City Medical Center Hospital)

Session 5  Developmental Therapeutics/Translational Research  9:50 – 10:40
Chair persons: Toshio Shimizu, M.D. (Kinki University)  Toru Mukohara, M.D. (Kobe University)
Hiroshi Mizuuchi, M.D. (Kinki University)  Chiun Hsu, M.D., Ph.D. (National Taiwan University Hospital, Taipei, Taiwan)
Yoshinori Imamura, M.D. (Kobe University)

Session 6  Radiation Oncology  10:40 – 11:30
Chair persons: Noboru Tanigawa, M.D. (Kansai medical University)  Norihiko Kamikonya, M.D. (Hyogo College of Medicine)
Mingwei Ma, M.D. (Peking University, Beijing, China)  Hitoshi Tatebe, M.D. (Kinki University)
Yoshiro Matsuo, M.D. (Kobe University)

Luncheon Seminar  11:45 – 12:45
Chair: Masakazu Yashiro, M.D. (Associate Professor, Department of Surgical Oncology, Osaka City University Graduate School of Medicine)
Yung-Jue Bang, M.D., Ph.D. (Professor, Seoul National University, Seoul, Korea)
Development of New Targeted Agents for Gastric Cancer: Future Perspective

Session 7  Oncology Nursing / Palliative Care -2  12:45 – 13:35
Chair persons: Harue Aarao, Ph.D, RN (Osaka University)  Jung-Tzu Hsu, Ph.D, RN (National Taiwan University Hospital, Taiwan)
Junichiro Inoue, Ph.D. (Kobe University)
Ikuko Komo, MSN, CNS, RN, AOCNS, ANP-BC (Stanford University Medical Center, Palo Alto, CA, USA)
Hiroko Sumi, RN (Kyoto University)

Session 8  Thoracic Oncology  13:35 – 14:25
Chair persons: James Chih-Hsin Yang, M.D. (National Taiwan University, Taiwan)
Tomoya Kawaguchi, M.D. (Osaka City University)
Taiichiro Ohtsuki, M.D. (Hyogo College of Medicine)  Jae Joon Han, M.D. (Seoul National University, Seoul, Korea)
Takayuki Takahama, M.D. (Kinki University)

Closing Ceremony  14:25 – 14:30
Closing Remark
Takashi Nakano, M.D (Professor, Division of Respiratory Medicine Department of Internal Medicine, Hyogo College of Medicine)
Greeting from the Director of Investigators Training Section
Upon the Opening of The 3rd International Symposium of
Training Plan for Oncology Professionals:

On behalf of “7-University Joint Project: Advanced Creative Plan for Cancer Education Base”, it is my great pleasure to announce you that 3rd International Symposium will be held on February 7-8, 2015 in Osaka, Japan. Last year, we have held 2nd International Symposium, which gathered 36 young investigators from all over the world, and had a great time of scientific discussion. The 3rd International Symposium gathers 41 young investigators from 5 different countries including young Japanese doctors, who are currently being trained in 7-University Joint Project (or its graduates), investigators not only from 7-University but also Kyoto University, Kyoto Pharmaceutical University, Mie University, Osaka University, Osaka Medical College, Ishikawa Prefectural Central Hospital, JCHO Osaka Hospital, Kobe City Medical Center General Hospital, Osaka City General Hospital and some young yet outstanding investigators from Asian countries (China, Korea, Taiwan) and the United States. We hope many of you will join this International Symposium and it will enrich your knowledge base and serve your advancement in the field of cancer treatment.

We cordially welcome you to this 3rd International Symposium of Training Plan for Oncology Professionals.

Kazuhiko Nakagawa, MD., PhD.
Professor, Department of Medical Oncology,
Kinki University Faculty of Medicine
Messages from the Executive Secretariat of The 3rd International Symposium of Training Plan for Oncology Professionals:

Dear Friends and Colleagues,

It is a great pleasure to invite you to participate in the 3rd International Symposium of Training Plan for Oncology Professionals, taking place in Osaka, Japan on February 7-8, 2015.

The aim of this symposium is to promote the mutual interaction between the Japanese young investigators, including medical oncologists, hematologists, radiation oncologists, surgeons, various kind of medical staff and foreign oncology researchers. Young investigators from 5 countries including USA, China, Korea, Taiwan and Japan who are actively involved in basic and clinical oncology research will give us presentation regarding their major field of research.

In an attempt to continue the great success from last year, we expanded the capacity of symposium in several ways. 1) The number of presenters increased from 36 (Last year) to 41) Poster Session was also added in the program. 3) In keynote lecture and luncheon seminar, we will have well-known professors from Korea and Taiwan to give us a lecture.

We look forward to welcoming you to an exciting and fruitful event in Osaka, known as "City of Food".

Best regards,

Toshio Shimizu, M.D., PhD.
Tsutomu Iwasa, MD., PhD.
Takeshi Yoshida, MD., PhD.
Masayoshi Kusunoki

Department of Medical Oncology,
Kinki University Faculty of Medicine

Toshio Shimizu, M.D., PhD
Assistant Professor (Lecturer)
Phase I Clinical Trials Program
Department of Medical Oncology
Kinki University Faculty of Medicine
Osaka, Japan

Takeshi Yoshida, M.D., PhD
Assistant Professor (Lecturer)
Department of Medical Oncology
Kinki University Faculty of Medicine
Osaka, Japan

Tsutom Iwasa, M.D., PhD
Assistant Professor (Lecturer)
Department of Medical Oncology
Kinki University Faculty of Medicine
Osaka, Japan

Masayoshi Kusunoki
Secretary, Department of Medical Oncology,
Kinki University Faculty of Medicine,
Osaka, Japan
Keynote Lecture

Chair
Kazuhiko Nakagawa, M.D., Ph.D.
Professor, Department of Medical Oncology,
Kinki University Faculty of Medicine

Molecular Targeted Therapy Trials:
Current Status and Issues

James Chih-Hsin Yang, M.D., Ph.D.
Professor, Graduate Institute of Oncology, Medical College, National
Taiwan University, Taipei, Taiwan

Biography: James Chih-Hsin Yang
Dr James Chih-Hsin Yang is a Professor of Graduate Institute of Oncology, joint-appointed at the Graduate Institute of Clinical Medicine and the Graduate Institute of Clinical Pharmacy of College of Medicine, National Taiwan University (NTUMC). He is currently the director of Cancer Research Center of NTUMC and serves as the director for Department of Medical Research and deputy director of Department of Oncology in National Taiwan University Hospital. He is a staff member in the Department of Oncology at the University Hospital since 1995. Dr Yang received his MD in 1986 and completed his internal medicine residency at the National Taiwan University Hospital. Between 1992 and 1995 he undertook medical oncology fellowship training at the National Cancer Institute at Bethesda, Maryland. He completed his PhD degree between 1996 and 2000 at the Graduate Institute of Clinical Medicine, NTU.
Dr Yang’s research focuses on lung cancer treatment and the mechanism of multidrug resistance of chemotherapy or targeted therapy. His basic research works included molecular mechanisms of resistance and reversal of resistance to chemotherapeutic agents and tyrosine kinase inhibitors. Dr. Yang is a leader in lung cancer clinical studies, especially in the development of chemotherapy and targeted therapy for lung cancer patients. He is the steering committee member or principle investigator of many lung cancer global studies. He contributed to the development of EGFR tyrosine kinase inhibitors, especially gefitinib, afatinib and mutant specific TKIs for EGFR mutation positive patients. Dr. Yang is the executive secretary of Taiwan Lung Cancer Clinical Trial Consortium (TALCC). He attended many advisory boards for clinical trial preparation and drug development. He served in the editorial board of Journal of Clinical Oncology, Annals of Oncology, Lung Cancer and he is currently the associate editor of Journal of Thoracic Oncology and Scientific Reports. He recently received 2nd Kobayashi Foundation Cancer Research Award in 2012 and distinguished research award of National Science Council, Taiwan in 2013.

Research Interest
Molecular diagnosis and treatment of lung cancer
Preclinical and clinical new cancer drug development
Research Areas of Interests
The 3rd International Symposium of Training Plan for Oncology Professionals
February 7 (Sat), 2015 Naniwa-no-Ma

Oral Session

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Session 2  Gastrointestinal Oncology 13:50–14:25
Session 3  Clinical Pharmacists in Oncology Practice 14:40–15:30
Session 4  Oncology Nursing / Palliative Care -1 15:30–16:05

Poster Session

Poster Viewing 16:05–16:35
Poster discussion-1 16:35–17:25

Poster-1  Lung Cancer 16:35–16:55
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Hematological Oncology

Chair persons, Shosaku Nomura, M.D. (Kansai Medical University) Hirohisa Nakamae, M.D. (Osaka City University)

Satoru Nanno, M.D.

Abstract

Diagnostic value of serum ferritin and risk factors for hemophagocytic syndrome following allogeneic hematopoietic cell transplantation

Satoru Nanno1, Hideo Koh1, Hirohisa Nakamae1 and Masayuki Hino1

1Hematology, Graduate School of Medicine, Osaka City University, 1-4-3, Asahimachi, Osaka Abeno-ku, Osaka 545-8585, Japan, E-mail: nanno1026@med.osaka-cu.ac.jp

Hemophagocytic syndrome (HPS) is a potentially fatal disease characterized by an uncontrolled activation of T cells and macrophages, leading to hypercytokinemia. Although a few reports have described the entity of HPS following allogeneic hematopoietic cell transplantation (allo-HCT), the risk factors, inflammatory process and diagnostic tool to detect HPS earlier have not been established yet.

We retrospectively examined the consecutive patients underwent HCT at our institute between 2006 and 2012. HPS was diagnosed using the modified HLH-2004 criteria. Moreover, we comprehensively analyzed 27 serum soluble factors in the patients with available blood samples. Of 223 evaluable patients, 18 patients developed HPS after allo-HCT. The area under the receiver operating characteristic curve of serum ferritin for HPS was 0.854 (P<.001), and the best cut-off value was 30,939 μ g/l. In univariable Cox models, the following factors were significant: HLA disparity in both directions: GVH (Hazard ratio 4.0; P=.004) and HVG (HR 4.5; P=.002), use of antithymocyte globulin (HR 3.4; P=.013), haploidentical (HR 4.4; P=.020) and cord blood (HR 3.3; P=.028), and use of macyhemorane moftel (HR 4.0; P=.022). Additionally, we found a significant elevation of broad-spectrum cytokines including Th1, Th2 and inflammatory cytokines, and chemokines at onset compared to levels prior to allo-HCT in nine patients. Our results suggest that serum hyperferritinemia with a higher cut-off level, for example, 30,000 μ g/l, may be useful to diagnose HPS after allo-HCT. In addition, allo-reactivity derived from HLA-mismatch, possibly causing a cytokine storm, may be associated with the development of HPS.
Marginal zone B-cell lymphoma in Korea: Clinical features, treatment, and prognostic factors based on Korean clinical studies

Sung Yong Oh

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Marginal zone B-cell lymphoma (MZL) is the second most common subtype of non-Hodgkin’s lymphoma (NHL) in Korea (20.1%), following diffuse large B-cell lymphoma. Mucosa-associated lymphoid tissue (MALT) can develop in nearly every organ in reaction to persistent stimuli such as chronic infection or certain autoimmune processes. Under conditions of prolonged lymphoid proliferation, a malignant clone may emerge, followed by the development of a MALT lymphoma. Whereas MALT lymphoma of the stomach is the most common and the most extensively studied such condition, in this session, we have focused principally on Korean non-gastric MZL (NG-MZL) studies highlighting the most recent advances in the current understanding of their definition, etiology, clinical characteristics, natural history, treatment approaches, outcome, and prognostic factors, discussing existing organ specific consideration and controversies, and identifying areas for future research.
Hematological Oncology

Chair persons, Shosaku Nomura, M.D. (Kansai Medical University)
Hirohisa Nakamae, M.D. (Osaka City University)

Masaaki Hotta, M.D.

Abstract

_Dendritic cells induced by GM-CSF preferentially expand regulatory T cells and reduce chronic graft versus host disease._

Masaaki Hotta, Atsushi Satake and Shosaku Nomura

1st. Department of Internal Medicine, Kansai Medical University, 2-5-1, Shin-machi, Hirakata City, Osaka, 573-1010, Japan, E-mail: hottam@hirakata.kmu.ac.jp

Allogeneic hematopoietic stem cell transplantation (allo-HSCT) is a curable treatment for hematopoietic malignancies. Graft versus host disease (GvHD) is a serious complication after allo-HSCT. Chronic GvHD (cGvHD) has become one of the most common and clinically significant problems affecting long-term allo-HSCT survivors.

Regulatory T cells (Tregs) have a suppressive ability for GvHD as they have been reported previously and in vivo expansion of Treg can be a useful cell-therapy against cGvHD. Tregs require dendritic cells (DC) and IL-2 for their maintenance and proliferation in the steady state. The expansion of DCs can lead to the proliferation of Tregs through the argumentation of T cell receptor signaling. Especially, GM-CSF-induced DCs can preferentially promote the Treg proliferation.

We hypothesized that the administration of GM-CSF could ameliorate GvHD through the proliferation of Tregs. To test this hypothesis, we used a MHC-matched mouse cGVHD model and administered GM-CSF 2 weeks after HSCT, and investigated the proportion of Tregs and the severity of cGvHD. Skin scores were significantly reduced in mice treated with GM-CSF than those of control mice. The proportion of Tregs significantly increased in mice treated with GM-CSF compared to control mice, indicating the attenuation of GvHD was associated with Tregs. These results suggest that the proliferation of Tregs by GM-CSF may be a therapeutic option for cGVHD.
Abstract

Heregulin-induced resistance against targeted therapy.

Yoshikane Nonagase1, Satomi Nishida1, Takayuki Takahama1, Naoki Takegawa1, Hiroto Ueda1, Kimio Yonesaka2, Takao Tamura1 and Kazuhiro Nakagawa1

1Department of Medical Oncology, Kinki University Faculty of Medicine, 377-2, Ohno-higashi, Osaka-Sayama City, Osaka 589-8511, Japan, E-mail: nonagase_y@dotd.med.kindai.ac.jp

2Sakai Hospital Kinki University Faculty of Medicine, 2-7-1, Harayamadai, Minami-ku, Sakai City, Osaka 590-0132, Japan

Targeted therapies to cancers tend to be more effective and less toxic than cytotoxic chemotherapy, but resistance against them happens as in cytotoxic therapy case. The epidermal growth factor receptor directed antibody, cetuximab is effective in colorectal, head and neck and non-small cell lung cancers. Some of the resistant mechanisms against cetuximab are now being clinically elucidated as a biomarker, such as RAS and BRAF. We have demonstrated other resistant mechanisms against cetuximab through ERBB2 amplification in the tumor and elevated serum heregulin level. Heregulin is a ligand to ERBB3, which can cause ERBB2/ERBB3 heterodimerization and thus activates downstream signaling. For patients with evidence of one of these drug resistance mechanisms, cetuximab combined with ERBB2 targeted therapy (for both mechanisms) or with an anti-ERBB3 antibody (heregulin only) should be further evaluated in clinical trials.
Gastrointestinal Oncology

Chair persons, Yung-Jue Bang, M.D., Ph.D. (Seoul National University)
Nariaki Matsuura, M.D., Ph.D. (Osaka University)

Education

2001.3-2003.2 Seoul National University College of Natural Sciences Pre-Medical Program
2003.3-2007.2 Seoul National University College of Medicine, Bachelor's Degree
2010.3-2014.2 Seoul National University College of Medicine, Department of Medicine, Master's Degree
2014.2-present Seoul National University College of Medicine, Department of Medicine, on Doctorate Degree program

Research and professional experience

2007.3-2008.2 Seoul National University Hospital, Internship
2008.3-2012.2 Seoul National University Hospital, Department of Internal Medicine, Residency
2012.3- Seoul National University Hospital, Department of Internal Medicine, Division of Hemato-oncology, Clinical Fellow

Abstract

Phase IIA Study to Evaluate the Biological Activity of ASLAN001 in HER-1/2 Co-expressing or HER-2 Amplified Advanced Gastric Cancer

Yaewon Yang1, Jin-Soo Kim2, Seock-Ah Im1, Keun-Wook Lee3, Jin Won Kim4, Woo Ho Kim4, Kyung-Hun Lee1, Sae-Won Han1, Tae-Yong Kim1, Do-Youn Oh1, Nayoung Lee5, Changhee Song5, Martyn Foster6, Mark McHale6, Alan Barge6, and Yung-Jue Bang1

1Department of Internal Medicine, Seoul National University Hospital, 2Department of Internal Medicine, Boramae Medical Center, 3Department of Internal Medicine, Seoul National University Bundang Hospital, 4Department of Pathology, Seoul National University Hospital, Seoul, South Korea, 5Inventive Health, Seoul, South Korea, 6ASLAN Pharmaceuticals, Singapore

Human epidermal growth factor (HER)-2 has been an important target in unresectable GC and trastuzumab in combination with chemotherapy has become the standard first line treatment for HER-2 overexpressing metastatic GC. Approximately 30% of GCs are known to co-express HER-1 and HER-2. ASLAN001 (formerly called ARRY-334543) is a potent, specific inhibitor of the tyrosine kinase domains of HER-1, HER-2 and HER-4. We examined the biological activity of ASLAN001 in patients with relapsed or unresectable GC who were confirmed to have either HER-1/2 co-expression, or HER-2 amplification. Previously treated GC patients with immunohistochemical (IHC) evidence of HER-1/2 co-expression (both ≥+1) or with HER-2 gene amplification by FISH were included. Patients received ASLAN001 500 mg bid orally for 28 days. Pre- and post-treatment endoscopic biopsies were performed on day 0 and day 28 respectively to evaluate the biochemical change after the treatment. HER-1/2 expression and their associated downstream molecules involving signal transduction pathways (MAPK, AKT) were evaluated both in total and phosphorylated forms using IHC. Proliferation of the tumor was evaluated by Ki-67 index and apoptosis by Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) assay. Twenty-two patients (14 HER-1/2 co-expressing and 8 HER-2 amplified) were enrolled from July 2012 to June 2013 in three centers of Korea. Seven patients (50.0%) had activation of MAPK at the baseline in the HER1/2 co-expressing group. Of them, 6 (85.7%) had significant reduction in MAPK activity on D28. Five patients (71.4%) showed a marked reduction in Ki-67 index and 2 patients (28.6%) showed a reduction in p-AKT. Of the 5 patients undergone TUNEL assay, 3 (60.0%) showed an increase of apoptosis. The pan-HER tyrosine kinase inhibitor ASLAN001 is a biologically active and a potent inhibitor of signal transduction in HER-1/2 co-expressing GC. Further clinical trial with ASLAN001 in combination with chemotherapy in patients with HER-1/2 co-expressing GC is about to start.
Clinical Pharmacists in Oncology Practice

Chair persons, **Midori Hirai, Ph.D** (Kobe University)
**Tomohiro Terada, Ph.D.** (Shiga University of Medical Science Hospital)

**Yasuhiro Kidera, Ph.D.**

### Abstract

**Risk Factors for cisplatin-induced nephrotoxicity and potential of magnesium supplementation for renal protection**

Yasuhiro Kidera¹,², Hisato Kawakami³, Toshio Shimizu³, Junji Tsurutani³, Yuzuru Yamazoe¹, Yasutaka Chiba⁴, Shozo Nishida² and Kazuhiro Nakagawa³

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²Division of Pharmacotherapy, Kinki University Faculty of Pharmacy, Higashi-Osaka, Osaka, Japan
³Department of Medical Oncology, Kinki University Faculty of Medicine,
⁴Division of Biostatistics, Clinical Research Center, Kinki University Faculty of Medicine

**<Background>** Nephrotoxicity remains a problem for patients who receive cisplatin chemotherapy. We retrospectively evaluated potential risk factors for cisplatin-induced nephrotoxicity as well as the potential impact of intravenous magnesium supplementation on such toxicity. **<Methods>** We reviewed clinical data for 401 patients who underwent chemotherapy including a high dose (≥60 mg/m²) of cisplatin in the first-line setting. Nephrotoxicity was defined as an increase in the serum creatinine concentration of at least grade 2 during the first course of cisplatin chemotherapy, as assessed on the basis of NCI-CTCAE v4.0. **<Results>** Cisplatin-induced nephrotoxicity was observed in 127 patients (32%), Multivariable analysis revealed that PS2 and the regular use of NSAIDs were significantly associated with an increased risk for cisplatin nephrotoxicity, whereas intravenous magnesium supplementation was associated with a significantly reduced risk for such toxicity. The development of hypomagnesemia during cisplatin treatment was significantly associated with a greater increase in serum creatinine level. Magnesium supplementation therapy was also associated with a significantly reduced severity of renal toxicity. **<Conclusions>** A relatively poor PS and the regular use of NSAIDs were significantly associated with cisplatin-induced nephrotoxicity, although the latter association was marginal. Our findings also suggest that the ability of magnesium supplementation to protect against the renal toxicity of cisplatin warrants further investigation in a prospective trial.
Clinical Pharmacists in Oncology Practice

Chair persons, Midori Hirai, Ph.D (Kobe University)
Tomohiro Terada, Ph.D. (Shiga University of Medical Science Hospital)

Dr. Anthony Perissinotti is a Clinical Pharmacist Specialist in Hematology/Oncology at the University of Michigan Health System and Adjunct Clinical Assistant Professor at the University of Michigan. Dr. Perissinotti obtained his Doctor of Pharmacy in 2010 from Wayne State University and went on to complete post-doctoral training at the Detroit Medical Center and MD Anderson Cancer Center.

Anthony J. Perissinotti,
PharmD, BCOP

Abstract

Pharmaceutical Care for Patients Receiving Cancer Treatment

Anthony J Perissinotti

Clinical Pharmacist Specialist, Inpatient Hematology/Oncology; Adjunct Clinical Assistant Professor; University of Michigan Health System; 1111 Catherine Street; Room 330 Ann Arbor, Michigan 48109 Office: (734) 615-3422 Fax: (734) 615-2314 Pager: (734) 936-6266 #37448 ajperis@med.umich.edu

The role of the Pharmacist in providing pharmaceutical care for oncology patients is dynamically changing. In the United States, the profession of Pharmacy has grown dramatically over the past decade. The Pharmacist’s degree has changed from a Bachelor of Science to an entry level Doctor of Pharmacy. Graduates are flooding into the Hospital, Academic, and Ambulatory Clinic settings. As a result, post-Doctoral training is becoming more common. In order to provide pharmaceutical care for patients receiving cancer treatment two years of post-doctoral training is recommended. Following post-doctoral specialty training, Oncology Specialty Pharmacists must continue to learn and read literature daily in order to keep up with the fast paced Oncology environment. Furthermore, Pharmacists are encouraged to take their board exams to become board certified in oncology pharmacy (BCOP). Oncology Pharmacist Specialists are involved in designing, monitoring, and changing chemotherapy for patients. They also play a prominent role in medical rounds in the day to day care of patients receiving chemotherapy. This entails formulating supportive care treatment plans for chemotherapy induced toxicities, infections, and their underlying comorbidities such as hypertension, diabetes, dyslipidemia, etc. Providing education is paramount to pharmaceutical care. Patients are educated by a Pharmacist on their chemotherapy regimen and their supportive care medications. Pharmacists also provide education to their Attending Physicians, fellows, residents, and students. Lastly, Oncology Pharmacists indirectly impact patients through clinical research, institutional guideline implementation, chemotherapy orderset building, and reporting of safety events.
Clinical Pharmacists in Oncology Practice

Chair persons, Midori Hirai, Ph.D (Kobe University)
Tomohiro Terada, Ph.D. (Shiga University of Medical Science Hospital)

Education
1999-2003  Undergraduate student
Kyoto Pharmaceutical University
Bachelor of Pharmacy degree received
2003-2008  Graduate student
Department of Pathological Biochemistry
Kyoto Pharmaceutical University
Doctor of Philosophy received
Dissertation Title: Association of cytosolic phospholipase A2 with development of dyslipidemia-induced atherosclerosis
2008-2008  Student studying abroad
University of Washington
Intensive English Program

Hiromi Ii, Ph.D.

Abstract

Development of a new anti-cancer drug that targets the novel cancer-related protein C7orf24

Hiromi Ii1, Keiko Taniguchi1, Taku Yoshiya2, Yuji Nishiuchi2, Susumu Kageyama3, Tatsuhiro Yoshiki1,3

1Department of Clinical Oncology, Kyoto Pharmaceutical University, 5, Misasaginakauchicho, Yamashinaku, Kyoto 607-8414, Japan, e-mail: ihiromi@mb.kyoto-phu.ac.jp; 2 Saito Research Center, Peptide Institute Inc., 7-2-9 Saito-Asagi, Ibaraki, Osaka 568-0085, Japan; 3 Department of Urology, Siga University of Medical Science, Seta Tsukinowa-cho, Otsu 520-2192, Japan

Introduction
Human chromosome 7 ORF 24 (C7orf24) is a γ-glutamyl cyclotransferase (GGCT) that is upregulated in bladder, cervical, lung, colon, and breast cancers and in several cancer cell lines. We had previously reported that repression of C7orf24 by a small interfering RNA (siRNA) inhibits the proliferative activity of cancer cells. Therefore, we suggest that C7orf24 could be a new target for anti-cancer drugs.

In this study, we determined the effects of inhibition of C7orf24 (using four different C7orf24-siRNAs) on the growth of cancer cell. We also determined the combined effects of siRNAs and apoptosis-inducing anti-cancer drugs on cancer cell lines. The mechanism underlying the anti-proliferative activity of C7orf24-siRNAs was studied by determining the changes in the levels of apoptosis-related proteins or through DNA fragmentation assays. We developed novel inhibitors of GGCT and tested the inhibition activity using recombinant GGCT protein synthesized in E. coli. We also developed a new method to determine GGCT activity directly from the cell lysate.

Results & discussion
Four different C7orf24-siRNAs inhibited the proliferative activity of cancer cells. This shows that C7orf24-siRNAs do not show “off-target” effects. The C7orf24-siRNAs increased the sensitivity of cancer cells to apoptosis-inducing anti-cancer drugs. The data on apoptosis-related factors showed that cell growth inhibition by C7orf24-siRNAs did not involve apoptosis. We found that glutaryl-alanine produced the highest inhibition of GGCT activity; however, its utility was limited by the fact that it could not pass through the cell membrane. Currently, we are developing new GGCT inhibitors that can pass through the cell membrane, which could have potential clinical applications.
**Oncology Nursing / Palliative Care**

*Chair persons, Sizue Suzuki, RN (Kobe City College of Nursing)  
Ikuko Komo, MSN, CNS, RN, AOCNS, ANP-BC  
(Stanford University Medical Center, Palo Alto, CA, USA)*

**Education**

Jung-Tzu Hsu is currently the Head Research Nurse of the Phase I Center, Department of Oncology, National Taiwan University Hospital. She received her RN degree in National Taipei University of Nursing and Health Sciences. She has been the Head Research Nurse of the Phase I Center since its inception in 2008 and involved in more than 40 oncology phase I trials, including first-in-human, first-in-Asian, and first-in-a new indication (e.g. hepatocellular carcinoma) trials. She currently oversees more than 6 clinical research nurses and 2 pharmacokinetic sampling specialists operating more than 30 oncology phase I trials concurrently at any given time. She is an active member of several professional societies, such as Taiwan Academy of Clinical Research Nurses.

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**Abstract**

**Role and Responsibility of Clinical Research Nurse**

Jung-Tzu Hsu, RN

Phase I Center, Department of Oncology, National Taiwan University Hospital, Taipei, Taiwan, e-mail: eminbnu@gmail.com; eminbnu@yahoo.com.tw

Clinical research nurses (or study coordinators) in Asia are primarily employed by hospitals. They assist doctors and scientists by accurately following the protocol and monitoring patients during trials of new drug or medical therapies. Each trial is assigned a research team member including clinical research nurses to ensure continuity of care for study patients as well as the needs of the study sponsor. Clinical research nurses are responsible for, (1) protocol management: Clinical research nurses maintain constant communication with physicians and clinical staff; (2) communication with study sponsors; and (3) patient care: Clinical research nurses are closely involved with patient screening, enrollment, education, and patient follow up. They evaluate patients’ responses to the product being studied by recording their vital signs and possibly collecting blood or tissue samples. In the event of an adverse reaction, they must be prepared to work with doctors to stabilize the patient’s vital signs.
Oncology Nursing / Palliative Care

Chair persons, **Sizue Suzuki, RN** (Kobe City College of Nursing)
**Ikuko Komo, MSN, CNS, RN, AOCNS, ANP-BC** (Stanford University Medical Center, Palo Alto, CA, USA)

**Education**
Human Health Sciences, Graduate School of Medicine, Kyoto University (Yoshida-Konoe-cho, Sakyo-Ku, Kyoto-city, Kyoto, Japan)

**Research Fellowship**
Division Japan Society for the Promotion of Science (JSPS)
Research Fellowship for Young Scientists: Doctoral course students (DC1)
(Kojimachi Business Center Building, 5-3-1 Kojimachi, Chiyoda-ku, Tokyo, JAPAN)

**Professional experience**
NISHIGAMO HOME NURSING STATION (Kyoto)
Home Occupational Therapist
Mar. 2013 to Apr. 2014

TSURUMAKI ONSEN HOSPITAL (Kanagawa)
Occupational Therapist

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**Abstract**

Effects of a self-exercise program on serotonin antagonist-induced constipation during chemotherapy in breast cancer patients: a randomized, controlled pilot trial

A. Hanai1, H. Ishiguro2, T. Souzu3, M. Tsuda2, H. Arai1, A. Mitani1, T Tsuboyama1

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Constipation is a common side effect of chemotherapy and various medications such as 5-hydroxytryptamine (serotonin) antagonists for nausea and vomiting. Physical exercise increases bowel movement and is recommended for patients as a non-pharmacological intervention for constipation. However, little is known about the effects of physical exercise on constipation due to serotonin antagonists. We hypothesized that self-exercise can mitigate constipation induced by serotonin antagonist and therefore designed a randomized, waiting-list controlled, parallel group, open-label pilot trial to assess the effects of a self-exercise program on constipation during chemotherapy. Thirty breast cancer patients receiving chemotherapy and using serotonin antagonists were randomized 1:1 into an intervention or waiting-list control group. The intervention group performed a self-exercise program involving abdominal massage, abdominal muscle stretching, and adopting posture with a good anorectal angle before chemotherapy. The primary endpoint was the change in constipation status measured using the Constipation Assessment Scale (CAS) between baseline and after chemotherapy. Secondary endpoints were frequency of laxative use, frequency of defecation. Mood status, general health-related quality of life and rest/activity patterns were also monitored.

The arms were well balanced. The CAS scores were significantly lower in the intervention group compared to the control group, although the frequency of laxative use and defecation shows no statistical differences between two groups. Our results indicate that the self-exercise program can reduce the risk of developing serotonin antagonist-induced constipation during chemotherapy.
A Phase I/II study of Erlotinib, Carboplatin, Pemetrexed and Bevacizumab in chemotherapy-naive patients with EGFR mutation positive advanced non-squamous non-small-cell lung cancer.

**Education**
2004-2010 Kawasaki Medical School (Okayama, Japan)

**Research and professional experience**
2014-Present Higashi Osaka Hospital

**Abstract**
Maiko Niki1, Takayasu Kurata1, Takashi Yokoi1 and Shosaku Nomura1

1Kansai Medical University Hiraoka Hospital, Department of Thoracic Oncology  
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**Background:** Epidermal growth factor receptor tyrosine kinase inhibitor (EGFR-TKI) drastically prolonged progression free survival (PFS) of patients with non-squamous non-small-cell lung cancer (NSCLC) harboring EGFR mutations. However, most cases show tumor regrowth after approximately only ten months treatment, and the prognosis is still poor. Then it is necessary to make new strategy of treatment for NSCLC harboring EGFR mutation. Then We designed phase I/II study of Erlotinib, Carboplatin, Pemetrexed and Bevacizumab in chemotherapy-naive patients with EGFR mutation positive advanced non-squamous NSCLC.

**Methods:** In the phase I part, eligible patients were administrated orally Erlotinib daily, and Pemetrexed, Carboplatin and Bevacizumab intravenously every three weeks for four cycles with maintenance of Pemetrexed and Bevacizumab until PD. The dose level of Erlotinib/ Pemetrexed/ Carboplatin/ Bevacizumab were 100, 150mg/500mg per m2/ AUC6/15mg per kg.

**Result:** Six patients were enrolled in Phase I part (level 1-three, level 2-three). The median age was 72 y.o. (Range, 46-76 y.o). Male was one and female were five. There was no adverse events as dose limiting toxicity in Phase I, and recommend dose of Erlotinib is 150mg daily.

**Clinical Features with Minor EGFR mutations in NSCLC**

**Education**
2007 M.D. Osaka Medical College  
2001-2007 Osaka Medical College

**Research and professional experience**
2007-2009 Junior Resident, Osaka Medical College  
2009-2010 Senior Resident, Department of Respiratory Medicine, Osaka Medical College Hospital  
2010-2012 Senior Resident, Respiratory Division, Department of Internal Medicine, Itami City Hospital  
2013- Medical staff, Department of Respiratory Medicine, Osaka Medical College Hospital

**Abstract**
Takahiko Nakamura1 and Yasuhito Fujisaka2,3

1 Osaka Medical College Internal medicine (1) , 2 Osaka Medical College Hospital, Clinical Research Center, 3 Osaka Medical College Hospital, Cancer Center  
2-7, Daigaku-machi, Takatsuki City, Osaka, 569-8686, Japan, E-mail: in1327@poh.osaka-med.ac.jp

**Background:** The most common epidermal growth factor receptor (EGFR) mutations (BS-90 %) are in-frame deletions of exon 19 and the Leu858Arg substitution in exon 21. Little is known about clinical course and characteristics with minor EGFR mutations.

**Methods:** Between January 2009 and July 2014, we performed EGFR mutations analysis on 450 samples of non-small cell lung cancer (NSCLC) patients. EGFR mutations were observed in 147 samples. We retrospectively examined patients with NSCLC harboring minor EGFR mutations about clinical backgrounds and efficacy of EGFR-TKIs.

**Result:** Minor mutations were observed in 9 patients (female / male : 4 / 5, median age : 66 years, smoke / non-smoke : 4 / 5, histology : adenocarcinoma). Three with exon 18 G719X (2 with G719C and 1 with G719A), and 4 with exon 21 L861Q. Complex mutation of exon 20 T790M and major mutation, and complex of exon 18 G719A and exon 21 L861Q was found in 1 patient each. Three of them received EGFR-TKI therapy (best response PD / SD / PR : 0 / 2 / 1, Progression-free survival 5.4 months, 2 months and 4 months, respectively ).

**Conclusions:** Minor EGFR mutations were found in 6.1% of NSCLC patients with EGFR mutation. Based on our results, minor EGFR mutated NSCLC had histology of adenocarcinoma with acinar subtype and sensitivity to EGFR-TKI is poor.
Poster Session 2

Chair persons
Toru Mukohara, M.D (Kobe University) Toshio Shimizu, M.D. (Kinki University)

Developmental Therapeutics/Translational Research

A Phase 1 Dose-Escalation Study of Eribulin and S-1 for Advanced or Metastatic Breast Cancer.

Tsutom Sakiyama

Education
2003 Apr - 2010 Mar Kinki university, Osaka, Japan Medical Student

Research and professional experience
2010 Apr - 2012 Mar Tokushima University Hospital, Tokushima, Japan
2012 Apr - 2014 Mar Kinki university, Osaka, Japan
2014 Apr - Present Kinki University Nara Hospital

Abstract
Tsutomu Sakiyama1, Junji Tsurutani1, Tsutomu Iwasa1, Hisato Kawakami1, Yoshikane Nonagase1, Takeshi Yoshida1, Kaoru Tanaka1, Yasuhiro Fujisaka2, Takayasu Kurata1, Yoshifumi Komoike1, Kazuto Nishio1, and Kazuhiko Nakagawa

1Phase I Clinical Trials Program, Department of Medical Oncology, Kinki University Faculty of Medicine, 377-2, Ohno-higashi, Osaka-Sayama City, Osaka 589-8511, Japan, E-mail: sakiyama_ti@nara.med.kindai.ac.jp

Background: Our aim was to evaluate the safety, maximum tolerated dose (MTD), pharmacokinetics (PKs), recommended dose for a phase 2 (P2RD) and preliminary anticancer activity of the combination eribulin and S-1 in patients with advanced or metastatic breast cancer (MBC) who were pretreated with anthracycline and taxane.

Method: Patients aged 20-74 years old were recruited. In level 1, patients received S-1 65mg/m² from day 1 to day 14, and eribulin 1.1 mg/m². In level 3, S-1 was increased to 80 mg/m².

Result: Twelve patients were enrolled into three cohorts. Planned dose escalation was completed with one case with dose-limiting toxicity (grade 3 hypokalemia) at level 3 and the MTD was not reached. The P2RD was determined level 3: eribulin 1.4mg/m² and S-1 65mg/m². Most common grade 3 or 4 toxicity was neutropenia (83.3%), followed by febrile neutropenia (25.0%). Five of 11 patients (45.0%) with measurable disease had a partial response. PKs were characterized by dose-dependent elimination and nonlinear exposure.

Conclusion: This combination therapy was feasible and well tolerated, of which preliminary antitumor activity warrants further investigation in this setting.

Hiroaki Shichiri

Apoptotic effects of the extracts of Cordyceps militaris via ERK phosphorylation in a renal cell carcinoma cell line.

Education
2007-2013 Himeji Dokkyo University Faculty of Pharmaceutical Sciences, Himeji
Research and professional experience
2013-Present Kobe University Graduate School of Medicine, Division of Pharmaceutics, Kobe, Training course for Cancer Researcher

Abstract
Hiroaki Shichiri1, Kazuhiro Yamamoto2, Tsutomu Nakagawa1, Takeshi Hirano1, Midori Hirai1,2

1Division of Pharmaceutics, Department of Biochemistry and Molecular Biology, Kobe University Graduate School of Medicine, 7-5-2, Kusunoki-cho, Chuo-ku, Kobe City, Hyogo Prefecture, JAPAN, 650-0017, E-mail: hoegaarden. blac0747@gmail.com
2Department of Pharmacy, Kobe University Hospital

Cordyceps militaris (CM) is a traditional medicinal mushroom used as a supplement for cancer treatment. Cordycepin (3'-deoxyadenosine) is the main active component of CM. Recent studies have shown that the antitumor effects of cordycepin are caused by inhibition of mammalian target of rapamycin (mTOR) signaling via phosphorylation of AMP-activated protein kinase (AMPK). However, a CM extract contains a large variety of medicinal components, and the molecular mechanisms of these effects have not been fully demonstrated to correspond with cordycepin alone. Therefore, we investigated the molecular mechanisms of antitumor effects of the CM extract in a renal cell carcinoma (RCC) cell line (786-O). We measured cordycepin concentration in a CM extract by high-performance liquid chromatography (HPLC) analysis. Cordycepin concentration was found to be 2541.9 μM. The survival rate of 786-O cells decreased in a dose-dependent manner of cordycepin, and the treatment of CM extract with corresponding concentrations of cordycepin (60 and 100 μM) inhibited cell proliferation significantly compared with cordycepin alone. Furthermore, the CM extract (cordycepin, 250μM) caused cell cycle arrest in the G1 phase more strongly than cordycepin alone. The amount of bound annexin V increased with increasing cordycepin concentration in the CM extract. Moreover, poly (ADP-ribose) polymerase (PARP) and caspase-3 were cleaved. As a result, treatment with the CM extract induced apoptosis more strongly than by treatment with cordycepin alone. At the same time the percentage of apoptotic cells increased in the CM extract, phosphorylation of STAT3 (TyR705) was suppressed with an increase in phosphorylation of Erk. Moreover, this effect was inhibited using cordycepin in combination with U0126 (MEK inhibitor). Recent studies have reported that inhibition of STAT3 activity in RCC cells links cell growth inhibition. Thus, our results suggest that the CM extract show more potent antitumor effects than cordycepin alone by inhibiting STAT3 and strongly activating Erk. In conclusion, the CM extract included unknown effective components that enhanced the effects of cordycepin, such as activating Erk.
Poster Session 2

Chair persons
Toru Mukohara, M.D. (Kobe University)  Toshio Shimizu, M.D. (Kinki University)

Developmental Therapeutics/Translational Research

Kengo Matsumura

Education
2004.4–2008.3 Undergraduate student
Kyoto Pharmaceutical University
2013.4–now Graduate student
Department of Clinical Oncology
Kyoto Pharmaceutical University

Research and professional experience
2008.4–2012.9 Novartis Pharma Oncology Division NR

Abstract
Kengo Matsumura¹, Hiromi Ii¹, Elki Hanada¹, Susumu Kageyama¹, Tatsuhiro Yoshiki¹,²
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²Department of Urology, Shiga University of Medical Science, Seta Tsukinowa-cho, Otsu City, Shiga 520-2192, Japan

Early-stage prostate cancers depend on androgens for growth and survival; however, advanced prostate cancer cells are androgen-independent. Docetaxel chemotherapy is the standard treatment for androgen-independent prostate cancer. Docetaxel helps improve survival but cannot completely cure the cancer. Research for better curative treatment for advanced prostate cancer is underway.

Proteomic studies have shown that the human chromosome 7 ORF 24 (C7orf24) is highly expressed in bladder cancer cells. This protein was identified as γ-glutamyl cyclotransferase (GGCT). C7orf24 is up-regulated in several types of cancers, including those of the bladder, prostate, breast, lung, and colon. Uejima et al. showed that down-regulation of C7orf24 by injection of anti-C7orf24-siRNA inhibited cell growth in a human osteosarcoma cell line. They also suggested that the mechanism of cell death, by using anti-C7orf24-siRNA, is not the way of apoptosis. We hypothesized that a combination of anticancer drugs such as docetaxel, and anti-C7orf24-siRNA may have a synergistic effect on cancer cell growth and conducted this study to evaluate the same. We observed that treatment with anti-C7orf24-siRNAs inhibited the proliferation of cancer cells when compared to cells treated with unrelated siRNAs. The 50% inhibitory concentration (IC50) of docetaxel in PC-3 cells was greater than its IC50 in LNCaP cells. Further, C7orf24-siRNAs considerably reduced the survival rates of cancer cells.

In conclusion, down-regulation of C7orf24 in combination with anticancer drugs holds promise as a new cancer treatment strategy.
Poster Session 3

Chair persons

Yasumasa Nishimura, M.D. (Kinki University)  Ryohei Sasaki, M.D. (Kobe University)

Radiation Oncology

3D-CRT for locally advanced hepatocellular carcinoma with invasion to intrahepatic large vessels: retrospective study

Education

2002-2008  Osaka City University Graduate School of Medicine
2013-Present  Osaka City University Graduate School of Medicine

Research and professional experience

2010-2012  Senior Resident, Department of Radiology, JCHO Osaka hospital
2012-2013  Senior Resident, Department of Diagnostic and Interventional Radiology / Radiation Oncology, Osaka City University Graduate School of Medicine
2013-Present  Graduate Student, Department of Diagnostic and Interventional Radiology / Radiation Oncology, Osaka City University Graduate School of Medicine

Abstract

1Eiichiro Okazaki, 1Akira Yamamoto, 1Norifumi Nishida, 2Ryo Ogino, 1Masako Hosono, 1Yasuhiro Shimitani, 1Shinici Tsutsumi, 1Yukimasa Sakai, 1Toshiyuki Matsuoka, and 1Yukio Miki

1Department of Diagnostic and Interventional Radiology / Radiation Oncology, Osaka City University Graduate School of Medicine, Osaka, Japan
2Department of Radiation Oncology, Tane General Hospital, Osaka, Japan.

Purpose: To evaluate the efficacy and safety of 3-dimensional conformal radiotherapy (3D-CRT) for locally advanced hepatocellular carcinoma (HCC) with invasion to intrahepatic large vessels.

Material and Methods: September 2007 and April 2013, 62 consecutive patients who had advanced HCC with large vessel invasion treated by 3D-CRT were reviewed retrospectively. The number of HCC patients with invasion to portal vein (PV) and inferior vena cava (IVC) were 56 and 6, respectively. Fifty nine patients received interventional therapies before radiotherapy. Median Child-Pugh and MELD score was 6 and 8, respectively.

A total radiation dose of 22 to 50 Gy (median 50 Gy) was delivered. Twenty four patients were treated with sequential transcatheter arterial infusion (TAI) chemotherapy and radiotherapy. Radiologic tumor response in tumor thrombus with CT or MRI imaging and the deterioration of hepatic function was assessed. Prognostic factors associated with overall survival were evaluated using the Kaplan-Meier survival curves and the Log-Rank tests.

Results: Median survival time (MST) was 6.8 months (range 1.1-30.5). Radiation-Induced Liver Disease (RILD) was not seen. Tumor shrinkage of thrombus was observed in 13 patients (24 %) among 55 patients on follow-up examination. Univariate analysis showed the significant relationship to overall survival in MELD score and total bilirubin. Overall survival did not differ in combined therapy group (TAI + 3D-CRT) from RT only group.

Conclusion: 3D-CRT for HCC with PVTT appears to be effective and safety. The baseline liver function was considered to be important for prolonged survival in these patients after 3D-CRT.

A stereotactic body radiotherapy planning to deliver an accurate dose to GTV of non-small cell lung cancer

Education

2009-2013  Osaka University Graduate School of Medicine, Division of Health

Education / Research and professional experience

2013-  Department of Medical Physics & Engineering, Osaka University Graduate School of Medicine

Abstract

Yasuhiro Shinohara 1, Masayoshi Miyazaki, Yoshihiro Ueda, Shingo Oohira, Masaaki Takashina Teruki Teshima, Kinji Nishiyama and Masahiko Koizumi

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At stereotactic body radiotherapy for early stage non-small cell lung cancer (NSCLC), the dose covering 95% volume of PTV (D95) is prescribed. Because the 95% isodose line is located in the lung of low density and absorbed doses to the lung tissue are lower than that to tumor, tumor dose is unexpectedly higher than the prescribed dose. We investigated a radiation planning approach to compensate the increase of dose to tumor. The subjects were 16 patients receiving SBRT for NSCLC. In AIP, RTP performed using two types of PTV: PTV in original AIP (control plan) and PTV of water density (test water plan). Prescribed dose was 48 Gy of D95. In two plans, monitor units of each beam were calculated using anisotropic analytical algorithm (AAA). The beams transferred to 10 respiratory bins with 1/10 monitor units of each beam of two plans in AIP and dose distribution was calculated. The dose distribution of each bin was deformed to the end expiratory CT set as reference along with deformable image registration (DIR). The dose was cumulated in the end expiratory CT set and dose volume histogram of the tumor (GTV) was evaluated.

Mean D95 of control plan was more than 110% while D95 of test water plan did not exceed 110% in any patient (range: 96.3-108%). Lung tumors were classified into tumors surrounded by lung tissue (tumor A, n = 8) and tumors adjacent to soft tissues (e.g. chest wall, mediastinum) (tumor B, n = 8). In the control plan, D95 of tumor A (mean: 112.3%) was significant higher than D95 of tumor B (mean: 109.7% (p<0.05)); while, in test water plan D95 of tumor A was not different between tumor A and B. In radiotherapy planning of SBRT for NSCLC, preventing unexpected higher dose to GTV, definition of PTV density as water could be an easy approach to deliver more accurate dose to the GTV.
Poster Session 3

Chair persons

Yasumasa Nishimura, M.D. (Kinki University)  Ryohei Sasaki, M.D. (Kobe University)

Radiation Oncology

Reduction of human errors in external radiation therapy by use of departmental incident reporting system and multidisciplinary team efforts

Education
1995-1999 OSAKA UNIVERSITY B.S. in Medical Physics and Engineering, School of Allied health sciences
2011-Present KINKI UNIVERSITY Department of Radiation Oncology, Graduate School of Medicin

Research and professional experience
April 1999-Present OSAKA UNIVERSITY HOSPITAL Radiological Technologist

Abstract
Seiichi Ota1,2, Hajime Monzen2, Iori Sumida3, Yasuo Yoshioka3, Ryoko Kado4 and Yasumasa Nishimura2

1Department of Medical Technology, Osaka University Hospital, 2-15 Yamadaoka, Suita, Osaka, 565-0871, Japan, E-mail: bormcooper@yahoo.co.jp,
2Department of Radiation Oncology, Kinki University Graduate School of Medicine, 3 Department of Radiation Oncology, Osaka University Graduate School of Medicine, 4 Department of Nursing, Osaka University Hospital.

Incidents in radiation therapy occur due to the complex process. We performed a prospective study to reduce the incident rate during 4 years of external radiation therapy using a voluntary incident-reporting system with multidisciplinary team (MDT) efforts. Our interventions included in the following four elements: (1) making certain of the standard procedures, (2) improving the efficacy, (3) improving communication, and (4) removing unclear regulations. The actual incidents occurred most frequently during treatment planning (73%, 36 of 49), followed by treatment delivery (20%, 10 of 49). Forty-two (86%) of the forty-nine incidents were due to a failure to follow procedures or policy, five (10%) incidents were caused by miscommunication, and two (4%) were caused by misoperation. The actual incident rates based on the number of treatment courses were 4%, 2%, 1% and 1% in the first, second, third, and fourth years, respectively. We found a significant decrease in the actual incident rate during the third and fourth years compared to that during the first year (p < 0.01). The frequency of incidents and near misses during radiation therapy was reduced by use of a voluntary incident reporting system and the efforts of a MDT.

Treatment Outcomes Of Particle Radiotherapy Using Proton Or Carbon Ion For Hepatocellular Carcinoma With Inferior Vena Cava Tumor Thrombus

Education
2004-2010 Kyushu University of Medicine
2010 M.D, Faculty of Medicine, Kyushu University of Medicine
2012-present Cancer Professional Training Foundation Promoting Plan, Graduate School of Medicine, Mie University

Research and professional experience
2010-2012 Resident, Hamanomachi Hospital, Fukuoka
2012-2013 Fellow, Department of Radiation Oncology, Southern Tohoku General Hospital, Fukushima
2013-Present Fellow, Department of Radiology, Hyogo Ion Beam Medical Center, Hyogo

Abstract
Yutaka Toyomasu1, Kazuki Terashima2, Osamu Fujii2, Yusuami Demizu2, Tomoki Okimoto2, Tomoko Kawamura2, Akinori Nakada2, Noriko Iizumi2, Nobukazu Fuwa2, Yoshito Nomoto2

1Department of Radiation Oncology, Mie University Graduate School of Medicine, 174, Edobashi 2-chome, Tsu, Mie, Japan, E-mail: y.toyomasu@clin.med.mie-u.ac.jp
2Departments of Radiology, Hyogo Ion Beam Medical Center, Tatsuno, Hyogo, Japan

Introduction: The prognosis of patients who have hepatocellular carcinoma (HCC) with inferior vena cava tumor thrombus (IVCCT) is very poor. Recently, it was reported that particle radiotherapy was one of the effective treatments for HCC. We evaluated the treatment outcomes of particle radiotherapy for HCC with IVCCT.

Methods: Between April 2005 and July 2012, 30 patients with HCC with IVCCT were treated with particle radiotherapy using proton or carbon ion at Hyogo Ion Beam Medical Center. Median patient age was 65 years (range, 52-83). Nine patients (30%) had portal vein tumor thrombus (PVTT). Nine patients (30%) had extrahepatic metastases. Treatment protocols were as follows; 52.8-56 gray equivalent (GyE) in 8 fractions for 2 patients (7%), 60-66 GyE in 10 fractions for 14 (40%), and 76 GyE in 18 fractions for 2 (7%), respectively. The Log-rank test and the Cox proportional hazards model were used for univariate and multivariate analyses.

Results: The median follow-up was 10 months (range, 3-47 months). The 1-3 year rates of overall survival were 50%/20%, respectively. Two patients experienced local recurrence within marginal sites of particle radiotherapy in all patients. Univariate and multivariate analyses revealed that the poor prognostic factors on OS were PVTT and extrahepatic metastases.

Conclusion: Particle radiotherapy for HCC with IVCCT showed favorable results with a few long-term survival. This treatment is thought to be one of the effective treatments for HCC with IVCCT.
The 3rd International Symposium of Training Plan for Oncology Professionals February 8 (Sun), 2015 Naniwa-no-Ma

Poster Session

Poster discussion-2 9:00 – 9:50

Poster-4 Oncology Nursing 9:00-9:50
Poster-5 Supportive care / Pharmacology in Cancer Treatment 9:00-9:30

Oral Session

Session 5 Developmental Therapeutics/Translational Research 9:50 – 10:40
Session 6 Radiation Oncology 10:40 – 11:30
Luncheon Seminar 11:45 – 12:45
Session 7 Oncology Nursing / Palliative Care -2 12:45 – 13:35
Session 8 Thoracic Oncology 13:35 – 14:25
Poster Session 4

Chair persons

Kyoko Tanaka, RN, Ph.D. (Osaka Prefecture University) Fumiko Koyama, RN (Kinki University)

Oncology Nursing

Self-care behavior of breast cancer patients who receive radiation therapy

Education
1994-1998 Hiroshima University, Institute of Health Sciences, Faculty of Medicine
2006-2008 Kobe City College of Nursing, Graduate School of Nursing, Master’s course
2013-Present Kobe City College of Nursing, Graduate School of Nursing, Doctoral course

Research and professional experience
2002-2006 Japanese Red Cross Hiroshima College of Nursing, Department of Nursing
2009-2011 University of Kindai Himieji, Department of Nursing
2011-Present Kansai University of Social Welfare, Department of Nursing

Abstract
Rie Hori1 and Hitomi Matsumoto2

1Doctorial Course, Graduate School of Nursing, Kobe City College of Nursing, 3-4, Gakuen-nishimachi, Nishiku, Kobe City, Hyogo 651-2103, Japan, E-mail: dt1303@st.kobe-ccn.ac.jp; Kansai University of Social Welfare, Department of Nursing
2Certified Nurse Specialist of Cancer Nursing, Department of Nursing, Steel Memorial Hirohata Hospital

The purpose of this study is to identify fatigue in breast cancer patients who receive radiation therapy, the factors which influence fatigue and the influence that fatigue has on daily life.

Ten patients (mean age: 53.1) who received radiotherapy after having undergone a mastectomy to treat breast cancer in a cancer hospital.

Patients were asked for the answer for to answer two questionnaires: Cancer Fatigue Scale (CFS) and MD Anderson Symptom Inventory-Japanese (MDASI-J) at three time points: baseline (T1), about two weeks later (T2), and upon completing radiation therapy (T3). The Center for Epidemiologic Studies Depression Scale (CESD) was used at T2 and T3 only. We asked Patients to keep self-check notes every day. The items of the notes were dietary intake, weight, physical fatigue, change of the skin of the irradiated part, sleep, efforts to improve their mood, and so on.

Mean score of CFS significantly increased two weeks later (T2), and mean score of CESD did not exceed 16, which was the cut-off score. The mean score of MDASI-J was low, so treatment did not influence daily life. Most patients kept writing self-check notes; they wrote about confirmation of the treatment plan, relations in breast cancer patients and adjustment of the housework. It was identified that patients coordinated housework, daily hospital visits and maintenance of a positive attitude in order to complete radiotherapy.

Menopausal symptoms and cognitive dysfunction in breast cancer patients receiving hormonal therapy

Education
2011 Bachelor of Science in Nursing, Osaka University Division of Health Sciences
2013 Master of Science in Nursing, Osaka University Graduate School of Medicine, Division of Health Sciences
2013-present Osaka University Graduate School of Medicine, Division of Health Sciences, Advanced Research Course of Cancer Nursing

Abstract
Sena Yamamoto1 and Harue Aara2

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2Osaka University Graduate School of Medicine, Division of Health Sciences

Menopausal symptoms are common side effects of hormonal therapy. Some studies suggest that hormonal therapy may also adversely affect cognitive function. The purpose of this study was to describe menopausal symptoms and cognitive dysfunction during hormonal therapy.

Breast cancer patients receiving hormonal therapy were evaluated using self-administered, anonymous questionnaires. Demographic information and data regarding menopausal symptoms and cognitive dysfunction were collected by mail. Menopausal symptoms were assessed by the simplified menopausal index (SMI). SMI is a 10-item scale, with a higher score (0–100) indicating a higher degree of severity. A cutoff point for menopausal disorder is 51. Cognitive dysfunction was assessed using an 11-item scale, which we developed based on our previous research. Respondents rated frequency of symptoms using a 6-point scale. This study was approved by the ethics committee.

Of 133 eligible patients, 83 responses (62.4%) were obtained. Their mean age was 52.5 ± 8.4 years, and the mean duration of hormonal therapy was 24.7 ± 17.2 months. On the SMI, 63 patients (75.9%) scored <51 and 20 patients (24.1%) scored ≥51. Among patients who scored ≥51, overall cognitive dysfunction tended to be more severe. In particular, there were statistically significant differences in attention, concentration, processing speed, and short-term memory between the two groups.

Patients receiving hormonal therapy tend to have severe cognitive dysfunction when menopausal symptoms are severe. It is important to develop a strategy to relieve these symptoms that can affect adherence to a medication regimen.
Poster Session 4

Chair persons
Kyoko Tanaka, RN, Ph.D. (Osaka Prefecture University) Fumiko Koyama, RN (Kinki University)

Oncology Nursing
The Aspect of “Strength” in Patients Receiving Curative Chemoradiotherapy for Lung Cancer

Education
- 2004 Bachelor of Science in Nursing, Osaka University Division of Health Sciences
- 2013 Master of Science in Nursing, Osaka University Graduate School Of Medicine, Division of Health Sciences

Research and professional experience
- 2004-2007 Registered Nurse, Division of Intensive Care Unit, National Cancer Center
- 2007-2012 Registered Nurse, Division of Surgical department, Osaka Welfare Pension Hospital
- 2014- Registered Nurse, Japan Community Health Care Hospital(JCHO Osaka Hospital)

Abstract
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1 Japan Community Healthcare Organization, Osaka Hospital
2 Osaka University Graduate School of Medicine, Division of Health Sciences

Lung cancer is the most common cause of cancer-related death in Japan, but we have very little effective treatment for advanced lung cancer. Chemoradiotherapy (CRT) is a combination of chemotherapy and radiotherapy, and it is expected to be capable of completely curing advanced lung cancer. However, it is possible that CRT will cause more severe side effects, for example, esophagitis, skin lesion, pneumonitis, and so on. Patients receiving this treatment often say, “I’m short on physical strength” or “Strength is a factor.” This study aims to analyze the meaning of “strength” in advanced lung cancer patients receiving CRT. Between April 2013 and September 2013, we conducted semi-structured interviews with six lung cancer patients receiving CRT. All patients were receiving concurrent chemotherapy. Data were collected on indicators of strength, change of strength, how to keep up strength, and what has an impact on strength. Audiotaped interviews were transcribed verbatim and interpreted using content analysis techniques. This study was conducted after being approved by the ethics committee. There were seven indicators of “strength”: weight, fatigue, sleep, muscular power, body temperature, blood cell count, and sense of direction. Furthermore, there were four bases of “strength”: trust in their body, volition to fight against cancer, past cancer experience, and state of mind. All of them took exercise and were careful about meals so as to maintain strength. Besides, consciously, they had a positive attitude to the treatment. The meaning of “strength” in advanced lung cancer patients is peculiar to the individual, so it is affected by physical, psychosocial, and spiritual aspects.

Experience and management of nail changes in outpatients with advanced colorectal cancer receiving epidermal growth factor receptor inhibitor therapy

Education
- 2002 Bachelor of Science in Nursing, Osaka University Division of Health Sciences
- 2008 Certified Nurse in Cancer Chemotherapy Nursing, Japanese Red Cross College of Nursing, Frontier Center
- 2014 Master of Science in Nursing, Osaka University Graduate School of Medicine, Division of Health Sciences

Research and professional experience
- 2002-2009 Registered Nurse, Division of Hematology, Ishikawa Prefectural Central Hospital
- 2009-2012 Registered Nurse, Certified Nurse, Outpatient Oncology Unit, Ishikawa Prefectural Central Hospital
- 2014- Registered Nurse, Certified Nurse, Outpatient Oncology Unit, Ishikawa Prefectural Central Hospital

Abstract
Naomi FUJIKA1, Eiko MASUTANI2, Harue ARAO3
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2 Osaka University Graduate School of Medicine, Cancer Education and Research Center
3 Osaka University Graduate School of Medicine, Division of Health Sciences

Objective: The purpose of this study was to identify the experience and management of nail changes in outpatients with advanced colorectal cancer receiving epidermal growth factor receptor inhibitor (EGFRi) therapy.

Methods: In this qualitative study, we conducted semi-structured interviews with 5 advanced colorectal cancer outpatients receiving EGFRi therapy. Data were collected from June 2013 to November 2013. The conceptual framework used the UCSF model for symptom management. Audiotaped interviews were transcribed verbatim and interpreted using content analysis techniques. This study was approved by the institutional ethical review board.

Results: The study included 3 men and 2 women. EGFRi were 4 Cetuximab and 1 Panitumumab. The median age was 65 years. Seventeen major and 59 medium categories were found at the analysis. Perception of symptoms was varied, grade 1 or 2 “Paronychia,” “Dry fingertips,” “Nail changes,” and “effects of peripheral neuropathy” for L-OHP, such as “increased pain of fingertips with peripheral neuropathy” and “numbness of fingertips with peripheral neuropathy.” In the evaluation of symptoms, participants monitored their symptoms carefully. Responses to symptoms included, “effects on life and work” due to pain of fingertips, which varied with grade, size of symptoms and lifestyle. In addition, they hesitated to report symptoms of their feet. In components of symptom management strategies, difficulties with self-care” included difficulties of care in daily life, “practice of self-care” changed over time, from an easy approach to “devices for care of fingertips” and “omission of care of fingertips.”

Conclusions: Peripheral neuropathy for L-OHP affected experience of nail changes in outpatients with advanced colorectal cancer receiving EGFRi Therapy. Therefore, nurses play important roles in understanding patients’ perception of early symptoms, in supporting their self-monitoring continuously and in offering nursing care according to the appearance time of symptoms and lifestyle.
Significance of the nursing care just after the breast cancer notice

**Education**
- 1987-1989: Osaka Municipal Momoyama Nursing school
- 2006: Certified Nurse in Cancer Chemotherapy Nursing, Japanese Nursing association kobe center for continuing education
- 2010-2012: Master, Osaka graduate school of medicine, cancer nursing clinical nurse specialist course

**Research and professional experience**
- 1989-1999: Nurse, a Surgery ward in Osaka City Juso Hospital
- 1999-2006: Competent nurse, Hematology ward in Osaka City General Hospital
- 2006-2010: Competent nurse, Outpatient Oncology Unit in Osaka City General Hospital
- 2012-present: Chief examiner nurse, Palliative care team nurse, Patient support center in Osaka City General Hospital

**Abstract**

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**Backgrounds:** Most patients just after the breast cancer notice are galvanized and confused. They often feel that their mind become a complete blank in their worst shape. Patients are required to make a treatment decision, although they can’t control the state of their mind. As generally reported, patients who make a treatment decision by themselves, would like to accept the disease and adapt to several adverse events. Recently, the stuff nurses certified oncology nursing have the honor of sitting with the patients at the time of the breast cancer notice in Osaka City General Hospital. Patients informed the breast cancer are supported to expedite decision-making about the treatment of their disease with the nursing counseling.

**Purposes:** This retrospective study was aimed to look upon the issues through the nursing counseling and to discuss how to do nursing care for patients with breast cancer.

**Methods:** Fifty-four patients just at the breast cancer notice sit with the stuff nurses were surveyed from April 2013 to March 2014. Patients’ characteristics were look up from their medical records and the information through the nursing counseling was studied by content analysis.

**Results:** All of 54 patients were female, and mean (± SD) age was 60 (±14.2) years old. The median times of nursing counseling was 2, and the maximum was 18. Eleven (20.4%) of 54 patients had the nursing counseling only once at the breast cancer notice, and 23 (42.6%) had the additional counseling. More than three times of the nursing counseling were required in 20 patients (37.0%). Except one patient, the counseling typically consisted of nursing care for emotional stress, including adhesion, attentive hearing, and sympathy, at the first time of nursing counseling. In addition, 7 patients (13%) were also supported to make a treatment decision. At the second time of nursing counseling, patients were usually informed a treatment plan for their diseases in detail. These patients had often mental trauma once again. Ninety-five percent of 43 patients received twice the counseling, were needed nursing care for emotional stress, while only 27.9% could be supported to make a treatment decision. At the third time of nursing counseling, 85% of 20 patients were still needed nursing care for emotional stress, while half of the patients could like to be supported for treatment decision making.

**Conclusions:** The major aim of nursing counseling was to care for emotional stress until second counseling in patients just after the breast cancer notice. Nursing care for mental distress should be continued beyond the third and more times of counseling. In addition, intensive support for the treatment decision making should be also important. This study suggested that more than two times of nursing counseling should be done enough to support a treatment decision making in patients with breast cancer.
Poster Session 5

Chair persons

Tatsuya Ioka, M.D. (Osaka Medical Center) Junji Tsurutani, M.D. (Kinki University)

Supportive care / Pharmacology in Cancer Treatment

Research on oxaliplatin induced peripheral neuropathy after first chemotherapy

Education

- 2008-2012: Kyoto University School of Medicine Faculty of Human Health Sciences, Kyoto, Japan
- 2012-2014: Department of Human Health Sciences, Graduate School of Medicine, Kyoto University, Kyoto, Japan

Research and professional experience

- 2012-present: Resident, Department of Occupational Therapy, Kyoto University Hospital

Abstract

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Background: Oxaliplatin is one of the main chemotherapeutic agents to treat colorectal cancer. Although oxaliplatin is known to cause chemotherapy-induced peripheral neuropathy (CIPN), effective prevention against or treatment for CIPN is lacking. This study aimed to investigate changes in the functioning of the arm and hand activities of daily living (ADL) and quality of life (QOL) after initial chemotherapy.

Methods: We conducted a survey of 38 colon cancer patients for whom the initial treatment plans included the FOLFOX or XELOX regimen. The patients underwent sensory function, muscular strength, and manual dexterity assessments as the objective measures and the European Organization for the Research and Treatment of Cancer Quality of Life Questionnaire C30 (QLQ-C30) and Disabilities of the Arm, Shoulder, and Hand (DASH) as the subjective measures. CIPN measurements were collected at baseline and before the second drug cycle.

Results: The static sensation worsened significantly between baseline and the second drug cycle. However, there were no significant changes in muscular strength and manual dexterity. Some of the QLQ-C30 subscales worsened while Emotional Functioning improved. Regarding DASH, there were statistically significant changes in the functional disorder and subjective symptoms.

Conclusions: This study suggests that static sensation would worsen even at the first chemotherapy cycle. Even before arm and hand function (e.g., muscular strength and manual dexterity) begin to decline, patients would experience a functional disorder and decreased QOL. Preserving or improving patients’ ADL and QOL is an important task of cancer treatment. Therefore, we should consider how to support them soon after initiating chemotherapy.

The impact of adding Aprepitant for the patients receiving moderate risk of emetogenic chemotherapy, a prospective, randomized trial

Education

- 2002.4 - 2008.3: Osaka Medical College, Osaka, Japan
- 2010.4 - 2014.3: Graduate School of Osaka Medical College, Osaka, Japan

Abstract

Ken Asaishi1 and Masahiro Gotoh1

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Background: Aprepitant, a neurokinin 1 antagonist, showed efficacy for chemotherapy-induced nausea and vomiting (CINV). Antiemetic guidelines recommend aprepitant for high emetogenic chemotherapy (HEC). This prospective, randomized, cross-over trial aimed to evaluate the efficacy of aprepitant for patients (pts) receiving moderate emetogenic chemotherapy (MEC).

Methods: Gastrointestinal cancer pts receiving MEC were randomly assigned to group A and B. We administered premedication as follows: In Group A, pts received palonosetron (0.5mg iv on day 1), and dexamethasone (9.9mg iv on day 1, and 8mg p.o. on days 2-3) (control premedication). In Group B, pts received aprepitant with control premedication. The primary endpoint was the degree of nausea and frequency of vomiting, and the secondary endpoints were the degree of appetite and dosage of rescue therapy.

Results: From January 2011 to March 2013, 100 pts were enrolled, and 83 were analyzed (female/male, 35/48; median age, 65 years; colonrectal/gastric, 64/19; left/rectal/oxaliplatin, 53/30). There were no significant difference between two groups about primary endpoints. The degree of nausea (≥ Grade2) was significantly lower in aprepitant-combination group (4.9%/19.0%, p = 0.047). CR rates (neither vomiting nor rescue therapy) was also significantly higher, especially on delayed phase (68.3%/57.1%, p = 0.02).

Conclusions: Adding aprepitant significantly reduced moderate and severe emesis compared with standard premedication, and improved CR rate especially on delayed phase. Adding aprepitant is promising for gastrointestinal cancer pts receiving MEC.
Effect of neurokinin-1 receptor antagonist on tacrolimus concentration in allogeneic stem cell transplantation

Abstract
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2Department of Pharmacy, Institute of Biomedical Research and Innovation
3Department of Hematology, Kobe City Medical Center General Hospital
4Department of Cell Therapy, Institute of Biomedical Research and Innovation

Background: Chemotherapy induced nausea and vomiting (CINV) is one of the most challenging adverse event in allogeneic hematopoietic stem cell transplantation (allo-HSCT). As the conditioning regimen includes moderately to highly emetogenic chemotherapy (MEC to HEC), it is crucial to administer optimal antiemetic agents. Although neurokinin-1 receptor antagonist (NK-1 RA) is normally given in HEC regimen, there is still limited information about safety in allo-HSCT. NK-1RA is known as an inhibitor of CYP3A4, it may affect on concentration of tacrolimus. Thus, we retrospectively examined effect of NK-1RA on tacrolimus concentration in allo-HSCT.

Methods: Between January 2012 and July 2013, we assessed 30 patients who were undergoing allo-HSCT in Kobe City Medical Center General Hospital and Institute of Biomedical Research and Innovation. The patients were divided into three groups; Aprepitant group, Fosaprepitant group, and Control. We compared tacrolimus C/D ratio on Day0 of allo-HSCT among three groups. Statistical analysis was approached by one way ANOVA.

Results: Male/Female=13/17. Median age 44 (range 17-66). Number of patients, Aprepitant group/ Fosaprepitant group/Control=16/4/10. C/D ratio (ng • kg/mL • mg) of tacrolimus, 598 ± 94/647 ± 177/613 ± 51 and there was no significant difference among three groups (p=0.657).

Conclusions: Our study suggests that administration of NK-1RA does not affect on tacrolimus concentration in allo-HSCT.
Developmental Therapeutics/Translational Research

Chair persons, Toshio Shimizu, M.D. (Kinki University)
Toru Mukohara, M.D. (Kobe University)

Hiroshi Mizuuchi, M.D.

Abstract

Collateral chemoresistance by ABCB1 overexpression in a lung cancer cell line with acquired resistance to erlotinib

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Introduction: Emergence of acquired resistance to epidermal growth factor receptor-tyrosine kinase inhibitors (EGFR-TKIs) is almost inevitable. So far, various resistant mechanisms including T790M, MET amplification and epithelial mesenchymal transition (EMT) have been reported. Although specific treatment strategies to care with each resistant mechanism are currently under development, cytotoxic agents are empirically used after failure of EGFR-TKIs. However, the effects of TKI resistance on the sensitivity to following cytotoxic agents are not clear.

Methods: We investigated sensitivity to five cytotoxic agents; cisplatin (CDDP), gemcitabine (GEM), docetaxel (DOC), paclitaxel (PTX) and vinorelbine (VNR) in erlotinib-sensitive lung adenocarcinoma cell lines and their resistant derivatives. Four lung adenocarcinoma cell lines HCC827, HCC4006, PC9 and H358 and their EGFR-TKI resistant derivatives were used.

Results: Erlotinib resistant HCC4006 (HCC4006ER) cells with EMT feature also showed decreased sensitivity to three anti-microtubule agents; DOC, PTX and VNR but not to CDDP and GEM, whereas the other resistant cells showed similar sensitivity to any of tested agents as well as their parental cells. Gene expression array and immunoblotting demonstrated that ATP-binding cassette sub-family B member 1 (ABCB1), also known as multidrug resistance protein was overexpressed in only HCC4006ER cells. ABCB1 knockdown restored sensitivity to anti-microtubule agents but not to erlotinib. Moreover, the HDAC inhibitor MS-275 reversed resistance to anti-microtubule agents via ABCB1 suppression.

Conclusion: Some acquired resistant cells to erlotinib with EMT phenotype also acquired resistance to anti-microtubule agents. However, T790M, MET amplification, loss of EGFR and IGF1R hyperactivation did not alter sensitivity to cytotoxic agents.
**Abstract**

*Potential of immunotherapy in patients with advanced hepatocellular carcinoma*

Chiu Hsu¹

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Immunotherapy represents a major breakthrough of systemic anti-cancer therapy for multiple cancer types. Patients with hepatocellular carcinoma (HCC) were usually excluded from early-phase trials of immunotherapy because most patients had underlying chronic viral hepatitis. We and other investigators found that lenalidomide, which has both immune-modulatory and anti-angiogenic activity, has promising anti-tumor efficacy for advanced HCC. Preliminary results from our trial of lenalidomide as second-line therapy for advanced HCC patients indicated that lenalidomide produced an objective response rate of about 10% and median progression-free survival of about 3 months. Our preclinical study using an orthotopic liver cancer model revealed that combination of lenalidomide and sorafenib, the standard systemic therapy for advanced HCC, produced significant synergistic anti-tumor efficacy in vivo. This synergistic effect was associated with a significant increase in interferon-γ expressing CD8+ lymphocytes in TILs, higher number of granzyme- or perforin-expressing CD8+ T cells, and vascular normalization in tumor tissue. The synergistic anti-tumor effect was abolished after CD8 depletion. Our data suggest that lenalidomide and other immune-modulatory agents can enhance the anti-tumor effects of sorafenib in HCC. Further clinical trials of combination therapy are warranted to improve treatment efficacy for this difficult disease.
Comparison of 2D- and 3D-culture models as drug-testing platforms in breast cancer

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While it is being recognized that screening of oncology drugs on platform using two-dimensionally (2D)-cultured cell lines is unable to precisely select clinically active drugs, three-dimensional (3D)-culture systems emerged showing potential of better simulating in vivo tumor microenvironment. The purpose of this study was to reveal differential effects of chemotherapeutic drugs between 2D- and 3D-cultures and to explore their underlying mechanisms. We evaluated differences between 2D- and 3D-cultured breast cancer cell lines by assessing drug sensitivity, oxygen status, and expression of Ki-67 and caspases. Three lines (BT-549, BT-474, and T-47D) developed dense multi-cellular spheroids (MCSs) in 3D-culture, and showed greater resistance to paclitaxel and doxorubicin compared to 2D-cultured cells. An additional three lines (MCF-7, HCC-1954, and MDA-MB-231) developed only loose MCSs in 3D, and showed drug sensitivities similar to those found in 2D-culture. Treatment with paclitaxel resulted in greater increases in cleaved-PARP expression in 2D-culture compared with 3D-culture, but only in lines forming dense 3D-MCSs. Hypoxia was observed only in dense 3D-MCSs. BT-549 had fewer cells positive for Ki-67 in 3D- than in 2D-culture. BT-474 had a lower level of caspase-3 in 3D- than in 2D-culture. Finally, we compared staining for Ki-67 and caspases in 2D- and 3D-primary-cultured cells originating from patient-derived xenograft (PDX), fresh PDX tumor, and the patient’s original tumor. 2D-cultured cells showed greater proportions of Ki-67-positive and caspase-3-positive cells. In conclusion, 3D-cultured cells forming dense MCSs may better than 2D-cultured cells in simulating important characteristics of tumor in vivo.
**Radiation Oncology**

Chair persons, **Noboru Tanigawa, M.D.** (Kansai medical University)

**Norihiko Kamikonya, M.D.** (Hyogo College of Medicine)

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**Mingwei Ma, M.D.**

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**Education**

2007- 2012  Hebei Medical University, Hebei, China.
2012- present  Peking University First Hospital, Beijing, China.

**Research and professional experience**

2012- present  Department of Radiation Oncology, Peking University First Hospital, Peking University Health Science Center.

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**Abstract**

**Androgen-like effects of cordyceps sinensis and its impact on the hormonal independent prostate cancer with or without radiation**

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Cordyceps sinensis(CS) is a traditional oriental medicine and it has been reported that a variety of its components have anti-tumor effect and androgen-like effect. Androgen is involved in the progression of prostate cancer including androgen-independent prostate cancer(AIIPC). In the present study, we found that in vitro treatment of CS resulted in inhibition of growth of PC-3 cells which is androgen-independent cell lines without androgen receptor(AR) expression, and promotion of proliferation of VCaP cells which shows AR expression at both mRNA and protein levels with no AR genes mutation. However, when bicalutamide (anti-androgen) was added, no stimulatory effect for VCaP cells could be found in the presence of CS. We further determined the in vivo effects of CS on the growth of PC-3 and VCaP cells. Testosterone propionate was administrated as positive control. No difference was found in PC-3 tumor-bearing mice. There was a trend that the VCaP tumors grew fast when CS was given by gavage, but the effect on tumor growth was significantly weaker than testosterone propionate injection. Interestingly, testis index of the mice was statistically lower in the testosterone propionate group than in CS and control group. Meanwhile, treatment of CS and testosterone propionate significantly increased serum PSA level of VCaP tumor-bearing mice. However, when radiation therapy was given to VCaP cells, there is no significant difference in terms of colony formation assay. Further experiments are needed to confirm this phenomenon. Our findings indicates that CS may have a stimulatory effect on the growth of VCaP cells in an AR-dependent way whereas its impact during radiation therapy needs to be further studied.
**Session 6**

**Radiation Oncology**

*Chair persons, Noboru Tanigawa, M.D. (Kansai medical University)*

*Norihiro Kamikonya, M.D. (Hyogo College of Medicine)*

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**Education**

- 2004-2010  Kinki University Faculty of Medicine
- 2010-2012  Resident, Fukui prefecture hospital
- 2012-Present  M.D., Faculty of Medicine, Kinki University of Medicine

**Research and professional experience**

- 2012-2013  Department of Radiology, Nara Hospital Kinki University Faculty of Medicine, Nara, Japan
- 2013-Present  Department of Radiation Oncology, Kinki University Faculty of Medicine, Osaka, Japan

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**Hitoshi Tatebe, M.D.**

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**Abstract**

**Effect of rapamycin, an mTOR inhibitor, on the radiosensitivity after BNCR**

**Purpose:**

To evaluate the effect of mTOR inhibitor on B-10 delivery in boron neutron capture therapy (BNCT), referring with or without B-10 carrier (p-boronophenylalanine-10B (BPA) or Mercaptododecaborate-10B (BSH)).

**Materials and Methods:**

Cultured SAS cells have been incubated for 2 hours at RPMI medium containing BPA or BSH at the dose of 10 ppm and mTOR inhibitor Rapamycin at the dose of 1 μM after incubating with mTOR inhibitor Rapamycin for 48 hours at RPMI medium. Subsequently, the SAS cells received neutron beam (= mixed beams), and SF (surviving fraction) was determined.

**Results:**

1. SAS following incubation with mTOR inhibitor (Rapamycin 1 μM) showed resistance to gamma-rays compared with no treatment with rapamycin.
2. The delivery of B10 from BPA and BSH into cultured SAS cells was reduced through the treatment with mTOR inhibitor, especially when BPA was employed.
3. Thus, in combination with mTOR inhibitor, BNCT should be performed after a pause following stopping administering the drug.

**Conclusion:**

Since many tumors are known for activating PI3K/AKT/mTOR pathway, mTOR inhibitor Rapamycin is thought to inhibit the pathway and tumor growth. But mTOR inhibitor can also inhibit absorption of B-10 on BNCT. In cancer therapy including BNCT, through treatment with mTOR inhibitor, it is thought that induced gamma-ray resistance and repression of distributing drugs into cancer cells should be fully taken into account.
A novel method of radioprotection for the gastrointestinal system: Efficacy of the reduced form of coenzyme Q10

Yoshiro Matsuo¹, Nelly¹, Naritoshi Mukumoto¹, Saki Osuga¹ and Ryohei Sasaki¹

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Background: The small intestine is known as a highly radiosensitive organ. However, effective method to avoid the radiation damage has not been proposed yet. Here we introduce our finding that the Reduced form of Coenzyme Q10 was novel and potent radioprotector of the small intestine in vivo.

Experimental design: Single dose (13Gy) of X-rays was irradiated to the mouse abdomen. The Reduced form of Coenzyme Q10 was administered before the irradiation. Body weight changes and survival rate of those mice were recorded for 30 days after the irradiation. The reactive oxygen species (ROS) production and cell apoptosis were evaluated by immunohistochemical analyses.

Results: Reduced form of Coenzyme Q10 improved the survival rate by prevention from radiation induced damage and excess weight loss. Briefly, all mice without administration of the Reduced form of Coenzyme Q10 died within 8 days after the radiation while all mice with administration were sound by the protective effect of the Reduced form of Coenzyme Q10. The ROS production, apoptosis in the crypt cells and villi, and structural changes of the small intestine were observed after the irradiation, and the administration of the Reduced form of Coenzyme Q10 diminished the ROS, apoptosis, and structural changes sharply.

Conclusion: These results together indicate that the Reduced form of Coenzyme Q10 had a strong radioprotective effects in vivo, and the consequence is to benefit the survival of intestinal crypt cells and villi after the abdominal irradiation.
Luncheon Seminar

Chair

Masakazu Yashiro, M.D.
Associate Professor, Department of Surgical Oncology,
Osaka City University Graduate
School of Medicine

Development of New Targeted Agents
for Gastric Cancer: Future Perspective

Speaker: Yung-Jue Bang, M.D., Ph.D.
Seoul National University College of Medicine & Hospital

Biography: Yung-Jue Bang
Professor Bang, Professor of Medical Oncology, is currently the President of Biomedical Research Institute and Director of Clinical Trials Center of Seoul National University Hospital. He was Director of Cancer Research Institute of Seoul National University from 2000 to 2006, the President of the Korean Cancer Study Group from 2006 to 2008, the Chairman of the Korean Association for Clinical Oncology from 2008 to 2100, the vice-President of Korean National Enterprise for Clinical Trials from 2009 to 2104, the Chairman of Department of Internal Medicine of Seoul National University College of Medicine from 2010 to 2014, and the Chairman of the Korean Cancer Association from 2012 to 2014. Dr. Bang has co-authored more than 340 papers in SCI-indexed international journals including New England Journal of Medicine and Lancet. He is primarily interested in gastric cancer and Phase I trials. He is the Principal Investigator of a number of international clinical trials including ToGA study, CLASSIC study, and GOLD study.
Effect of physical exercise on psychological stress relief in cancer patients: Objective assessment of psychological stress with salivary amylase activity

Junichiro Inoue¹, Rei Ono², Daisuke Makiura¹, Miyuki Kashiwa¹, Yasushi Miura¹ and Yoshitada Sakai¹

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It is reported that stress and depression would be related to prognosis and quality of life (QOL) in cancer patients, therefore, the relief from stress is one of important themes to be solved. The salivary amylase activity (sAMY) innerved by the sympathetic nervous system (SNS) can be used as a stress parameter measured objectively and easily. In the present study, we investigated the immediate effect of exercise on stress relief in cancer patients by using sAMY.

The subjects were 35 cancer patients who performed the inpatient rehabilitation. The patients performed the exercise program consisted of stretching, muscle strength training, biking on ergometer, and ADL training for 20 to 30 minutes. sAMY was measured using the sAMY monitor prior to exercise (pre-ex), just after exercise (post-ex), at 10 minutes after exercise (post-ex 10min), and at 30 minutes after exercise (post-ex 30min).

The results showed that the values of sAMY were 2070 ± 147.2 kIU/L at pre-ex, 266.3 ± 170.6 kIU/L at post-ex, 145.2 ± 115.1 kIU/L at post-ex 10min, and 85.6 ± 98.6 kIU/L at post-ex 30min. Compared with the value at pre-ex, sAMY at post-ex increased and those at post-ex 10min and 30min decreased significantly (p<.01).

The patients were in stressful condition at pre-ex as sAMY showed the high value. sAMY further increased at post-ex with SNS activation by exercise. sAMY decreased at post-ex 10min and 30min with SNS inactivation and relative parasympathetic nervous system activation by exercise termination.

As a conclusion, the immediate effect of exercise on stress relief in cancer patients was shown objectively by the change of sAMY.
Session 7

Oncology Nursing / Palliative Care -2

Chair persons, Harue Arao, Ph.D, RN (Osaka University) Jung-Tzu Hsu, Ph.D, RN (National Taiwan University Hospital, Taiwan)

Ikuko Komo, MSN, CNS, RN, AOCNS, ANP-BC

Abstract

Using A Six-Step Evidence-Based Practice Change Model to Reduce the Rate of Central Line-Associated Blood Stream Infections in Oncology Patients

Ikuko Komo

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Central line (CL) associated blood stream infection (CLABSI) is one of the most costly and deadly hospital associated infections, particularly in cancer patients who experience a higher mortality rate. Despite numerous interventions to decrease CLABSIs on an Oncology unit at one Magnet designated hospital, a high rate of CLABSIs persisted. Multiple factors may lead to developing CLABSIs, which can create difficulties in identifying specific potential causes. The purpose of this EBP project was to utilize a six-step EBP change model in a systematic process to reduce the rate of CLABSIs. The first step involved an Assessment of the need for change. We compared the unit’s CLABSI rate to national rates in the National Database of Nursing Quality Indicators database. The nursing staff was observed one-on-one for technique related to CL maintenance. Second, problems, outcomes and interventions were linked because of discrepancies in the methods staff cared for CLs. Hospital policies related to CL care were linked to clinical guidelines. The third step included an exhaustive Synthesis of evidence from literature. The fourth step included the practice change Design, to reduce discrepancies and produce an evidence-based policy and a hands-on checklist. We also designed a fishbone diagram to evaluate the causes and effects of each CLABSI to determine what measures to take to reduce infections. As a result, improper techniques with CL maintenance and the need for re-education were identified. Additionally, systematic analysis was conducted to address barriers and improve facilitation of change. Implementation, the fifth step, included hands-on re-education of hand washing, blood culture collection, intravenous port accessing/de-accessing, and peripheral inserted central catheter dressing change stations on all of the nursing staff. An approximately 75% reduction of CLABSIs was achieved and $600,000 was saved. The sixth step is to Integrate and maintain the low CLABSI rate through continued monitoring for adherence with daily rounding by leadership. This project demonstrates that using the six-step EBP change model can help the success of EBP project in infections in oncology patients.
Oncology Nursing / Palliative Care -2

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Hiroko Sumi, RN

Education
1996-1999   Osaka City Nursing School
1999-2001   Kobe City College of Nursing (Bachelor of Science in Nursing)
2007-2009   Kobe City College of Nursing Graduate School (Master of Science in Nursing Major)

Research and professional experience
2001-2008   Osaka City Juso Hospital
            Gastrointestinal Surgery Department/Department of Gastroenterology/hepatology
2010-2013   Breast Surgery Department/Gastrointestinal Surgery Department
            Urology Department
2010-2014   Kyoto University Hospital (work as a Certified Nurse Specialist in Cancer nursing)
2013-2014   Palliative care team

Abstract

Changes in mental condition of family members of end-of-life cancer patients on transition of place of treatment

Hiroko Sumi¹ and Shizue Suzuki²

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Cancer patients diagnosed with incurable terminal disease and their families suffer from various kinds of physical and psychological distress. Previous studies have shown the critical role of nursing care staff in supporting patients and their families when they are faced with making a very difficult decision.

The aim of this study is to identify the real patient’s needs in order to lead the support providers through understanding the mental condition of family members of terminally ill cancer patients who need to make a decision-for further medical treatment for the patient.

14 family members of terminal cancer patients are interviewed in a semi-structured manner. The patients had experienced a switch/gone through transition from cancer treatment into palliative care and transition from an acute care setting to a home care setting. The kind of support provided to the families can be classified into/falls into 4 categories:

information about the place of the treatment,
preparation for home setting care,
communication with the patient and their family,
and timely support meeting the family’s needs.

The families acknowledged that the nursing staff understood patient’s and family’s feelings well and provided them with the necessary support when frequently visiting bedside and listening to them.

Effective communication and timely support in accordance with family’s needs seemed to facilitate family’s decision of choosing home care. When the family recognized that they could trust the medical staff and what they recommended about transition to home care setting.

In conclusion, effective support for terminally ill cancer patients on transition to home care setting should be provided in accordance with family member’s mental state.
Postoperative chemotherapy after pleurectomy/decortication in malignant pleural mesothelioma.

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4Department of Thoracic Surgery, Hyogo College of Medicine

**background:** About the utility of the combined modality therapy for operable malignant pleural mesothelioma, we are conducting clinical trials in our hospital. We examined a case given chemotherapy after pleurectomy/decortication (P/D) enforcement in our hospital.

**method:** Among 22 patients who underwent P/D in this hospital respiratory surgery dep by April, 2014 from April, 2009, we intended for 11 cases, except four cases that took effect in another hospital, one case that did not undergo six cases before the induction postoperative chemotherapy now

**results:** Nine men, women two, median age were 66. All the histologic types were epithelial. CDDP+PEM was given to all cases as preoperative chemotherapy. PS0 two cases, PS1 were nine cases. Seven cases were given CDDP+PEM, one case was given CBDCA+PEM, three cases were treated by the PEM alone. In the CDDP+PEM administration example, the administration course number was an average of 2.6, number of the total administrations 18. The case that caused a postoperative recurrence was two of 11 after chemotherapy now.

**conclusion:** We examined a case given postoperative chemotherapy after P/D for the malignant pleural mesothelioma.
Abstract

Change of PD-L1 expression after acquiring resistance to gefitinib in association with tumor-infiltrating lymphocytes in EGFR mutant non-small cell lung cancer

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Departments of¹ Internal Medicine and³ Pathology, Seoul National University Hospital,² Cancer Research Institute, Seoul National University College of Medicine, Seoul, Korea, E-mail: jchrste@snu.ac.kr

Programmed death receptor ligand-1 (PD-L1) is highly expressed in many human tumors and elevated expression is often associated with a worse prognosis. Epidermal growth factor receptor (EGFR) pathway contributes to PD-L1 expression in EGFR-mutant lung cancer. We investigated change of PD-L1 expression in association with tumor-infiltrating lymphocytes after disease progression with gefitinib treatment. Immunohistochemistry of PD-L1, PD-1, CD3, CD4, CD8, FOXP3, and CD68 were performed on 36 paraffin-embedded tissue samples at diagnosis and after disease progression with gefitinib in 18 EGFR mutant non-small cell lung cancer patients. Gefitinib resistant (GR) sublines were established from PC-9 parental cells. PD-L1 expression of GR sublines were compared to their parental cells. The median age was 62 years and 61% were females. Sixty-seven percent of the patients were never-smoker. Sixty-one percent of patients had exon 19 deletion and 33 percent had L858R mutation. One patient had exon 19 deletion and L858R mutation. PD-L1 expression was determined with H-score at the time of initial diagnosis and follow-up biopsy after disease progression to gefitinib treatment. Twenty-seven percent of patients who had no PD-L1 expression at diagnosis remained negative for PD-L1 expression at follow-up. In 77 percent of patients, expression of PD-L1 significantly changed. GR sublines showed significant increase of surface PD-L1 expression compared to parental cells by fluorescence activated cell sorting and immunoblot analysis. These results suggest that the expression of PD-L1 by tumor cells change after acquiring resistance to gefitinib. In addition, change of PD-L1 expression influenced T lymphocyte density in the tumor microenvironment.
Thoracic Oncology

Chair persons, James Chih-Hsin Yang, M.D., Ph.D. (National Taiwan University, Taiwan) 
Tomoyta Kawaguchi, M.D. (Osaka City University)

Takayuki Takahama, M.D.

Education

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<th>Position</th>
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<tr>
<td>Mar 2009</td>
<td>M.D., # 476425</td>
<td>Board Certified Member of the Japanese Society of Internal Medicine,</td>
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<tr>
<td>Sep 2012</td>
<td>Internship and Residency</td>
<td>Kagawa Prefectural Central Hospital</td>
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<tr>
<td>April 2014</td>
<td>General Clinical Oncologist by Japanese Board of Cancer Therapy,</td>
<td>Kagawa University Hospital</td>
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<tr>
<td>2009-2012</td>
<td>Medial staff</td>
<td>Division of Endocrinology and Metabolism, Hematology, Rheumatology</td>
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<td></td>
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<td>and Respiratory Medicine, Department of Internal Medicine</td>
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<tr>
<td>2013-present</td>
<td>Assistant Professor</td>
<td>Department of Medical Oncology</td>
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Research and professional experience

Abstract

Feasibility study on detecting EGFR T790M mutation in cell free DNA in non-small lung cancer patients refractory to EGFR-TKI

Takayuki Takahama¹, Kazuko Sakai², Masayuki Takeda¹, Kazuto Nishio² and Kazuhiko Nakagawa¹

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²Department of Genome Biology, Kinki University Faculty of Medicine, 377-2, Ohno-higashi, Osaka-Sayama City, Osaka 589-8511, Japan

Lung cancer is a most common cause of death in the world. Non-small cell lung cancer (NSCLC) account for 85% of all lung cancer. NSCLC patients with an activating mutation within the tyrosine kinase domain of the epidermal growth factor receptor (EGFR) respond strikingly to EGFR tyrosine kinase inhibitors (TKIs). Several prospective clinical trials treating patients harboring EGFR mutation with EGFR-TKI have been reported to date. They show remarkably better and longer response than platinum-based chemotherapy. Unfortunately, all patients develop progressive tumor growth while EGFR-TKI treatments. Almost 50% of patients acquire secondary mutation in EGFR T790M, and then they acquire resistance to EGFR-TKI therapies. Whereas several new EGFR-TKIs that work even in patients with EGFR T790M mutation are in development recently. These genotype oriented therapies need tumor tissue sample, but the challenge of tumor re-biopsy is major limitation especially in NSCLC patients. Then we suggested feasibility study of detecting EGFR T790M mutation in cell free DNA in NSCLC patients refractory to EGFR-TKI in West Japan Oncology Group (WJOG). Since November 2014, we start to collect liquid biopsy samples and measure EGFR T790M mutation. I will present our study overview and future perspective of liquid biopsy.
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