Abstract

1. Prevention of chemoradiation-related mucositis in patients with head and neck cancer using dexamethasone-based mouthwash (Miracle mouthwash): A phase II randomized double-blind, placebo-controlled study

2. Prognostic factors of tumor recurrence in completely resected lymph node–negative pulmonary adenocarcinoma

3. A Pilot study of using Smartphone Application Versus Routine follow up for patients care in Advanced Non-Small Cell Lung Cancer (NSCLC)

4. No survival benefit of adding methotrexate for localized osteosarcoma in adult

5. The Prevalence of Vitamin D Deficiency in Thai Cancer Patients, its Dynamics and Association with Cancer Survival

6. Pre- and Post-Surgery Metabolomic Profiles in Early-Stage NSCLC Patients

7. Differential Expression of Immune-Regulatory Protein on Peripheral Blood Mononuclear Cells in Advanced Stage Non-Small Cell Lung Cancer Patients


9. Quality-adjusted Life Expectancy in Non-small Cell Lung Cancer Patients in Rajavithi Hospital

10. Exploratory elemental analysis of lung cancer tissue in Maharaj Nakorn Chiang Mai hospital

11. Excision repair cross-complementation group 1 and 2 (ERCC1/2) variants and chemotherapy treatment outcome in Cholangiocarcinoma

12. Recurrent colorectal cancer: clinical presentation and mode of detection

13. Clinicopathological Characteristics and Survival Outcomes of Adolescent and Young Adult-Onset Sporadic Microsatellite Stable Colorectal Cancer in Thai Population

14. Tumor Genetic Mutation Profiles in Colorectal Liver Metastasis Patients with Early Recurrence and Long-term Disease Free after Hepatic Resection

15. Incidence of oxaliplatin hypersensitivity infusion reaction after premedication with dexamethasone, histamine-1 and -2 blockers in patients who retreated with oxaliplatin, a prospective study

16. Reliability, validity and feasibility of the Thai translation (Thai G8) of the G8 screening tool in geriatric oncology

17. Risk and Impact of Renal Impairment of Locally Advanced Head and Neck Squamous Cell Carcinoma (HNSCC) Patients Who Received Chemoradiotherapy (CRT) with Cisplatin

18. Survival of Hormone Receptor-Positive, HER2-negative Metastatic Breast Cancer that had Progressed on Previous Nonsteroidal Aromatase Inhibitors with or without Everolimus and Exemestane Combination

19. Prognostic significance of cyclin B1 expression plus clinicopathologic features in hormonal positive, HER2 negative early breast cancer in King Chulalongkorn Memorial Hospital During 2010-2015

20. The positive predictive value of immunohistochemistry of HER2 for positive in situ hybridization in breast cancer at Rajavithi Hospital and cardiac safety of trastuzumab
Prevention of chemoradiation related mucositis in patients with head and neck cancer using dexamethasone based mouthwash (Miracle mouthwash): A phase II randomized double blind, placebo controlled study

Panathut Kaewvatee 1, Chatchanin Ajalanond 2, Siriwimon Srichamchan 1, Kasan Seetalarom 1, Naiyarat Prasongsook 1

1 Division of Medical Oncology, Department of Medicine, Phramongkutklao Hospital, Bangkok, Thailand
2 Department of Pharmacy, Phramongkutklao hospital, Bangkok, Thailand

**Background:** Oral mucositis (OM) is the most common adverse event in patients with head and neck cancer (HNC) who are treated with chemoradiotherapy (CRT). Normal saline/ or benzydamine hydrochloride oral rinse might reduce OM incidence and severity. However, the need for interruption of CRT may occurred. A phase II study of steroid solution for stomatitis prophylaxis has been reported in patients with advanced stage breast cancer who was treated with mTOR inhibitor. We aimed to assess the efficacy of dexamethasone-based mouthwash for prevention of oral mucositis (OM) in HNC patients who were receiving CRT.

**Patients & Methods:** In this phase 2, double-blind, placebo-controlled study, we enrolled 27 patients with HNC who were treated with CRT. Those patients were randomized (1:1) to received dexamethasone-based mouthwash (0.5 mg in 10 ml of normal saline solution) (n=14) versus placebo plus normal saline solution (n=13) at a day before starting in CRT schedule (rinse for 2 min and spit, four time daily for 10 weeks). The primary endpoint was incidence- and severity of OM, which focused on pain score by 10 weeks evaluated in the full analysis.

**Results:** There was statistically significant difference in the incidence of WHO grade 2 OM at 3 weeks after randomization (23.1% placebo group vs 0% in dexamethasone-based solution group, p-value=0.003). At 6 weeks, 84.6% of patients in placebo group developed grade 2 or higher OM, and only 7.1% in dexamethasone-based solution group (p-value <0.001). Furthermore, pain score in patient with dexamethasone-based solution group was lower than placebo group significantly at 3 weeks until complete treatment.

**Conclusions:** Dexamethasone-based solution mouthwash significantly reduced the incidence and severity of oral mucositis in head and neck cancer patients receiving chemoradiotherapy, and could be a new standard of care for prevention of oral mucositis from chemoradiation treatment.
Prognostic factors of tumor recurrence in completely resected lymph node–negative pulmonary adenocarcinoma

Leeladejkul Nussara 1, Chantranuwat Poonchavist 2, Teerapakpinyo Chinnachote 2, Shuangshoti Shanop 2, Vinayanuwattikun Chanida 1, Sitthideatphaiboon Piyada 1, Sriuranpong Virote 1

1 Division of Medical Oncology, Department of Medicine, Faculty of Medicine, Chulalongkorn University and the King Chulalongkorn Memorial Hospital, Bangkok, Thailand
2 Departments of Pathology, Faculty of Medicine, Chulalongkorn University and the King Chulalongkorn Memorial Hospital, Bangkok, Thailand

Background: Patients with completely resected lymph node–negative pulmonary adenocarcinoma have a relatively better prognosis, however, a significant number of these patients have recurrent diseases. This study aimed to identify the clinical, pathological, or molecular prognostic factor for tumor recurrence in these patients.

Methods: We recruited 220 patients with lymph node-negative pulmonary adenocarcinoma who were diagnosed and treated at the King Chulalongkorn Memorial Hospital from January 1, 2009, to December 31, 2016. Recurrence was documented by pathological diagnosis, imaging confirmations, or death. Recurrence-free survival was analyzed by univariable and multivariable Cox regression analysis.

Results: Median time of follow up was 4 (2.7-5.6) years. Majority of patients were female (61.8%), never smoking (67.7%), stage I (85.5%) and EGFR mutations (53.6%). The average number of lymph node removed from surgery was 10 (6-16). There were 60 out of 220 (27.3%) patients had recurrent disease. The median time to recurrence was 2.3 years. The rate of loco-regional, distant and both types of recurrence was 26.7%, 68.3%, and 5% respectively. Univariate analyses revealed smoking ≥ 10 pack-year, performance status ≥ 2, tumor size ≥ 4 cm, histologic grade ≥ 2, lymphovascular invasion, visceral pleural invasion, tumor necrosis, and bronchial resection margin < 2 cm were significant prognostic factors for tumor recurrence. Sensitizing EGFR mutation was not a significant prognostic factor in this cohort. However, tumor size ≥ 4 cm, visceral pleural invasion, tumor necrosis, and bronchial resection margin < 2 cm were the remaining significant prognostic factors under multivariate analyses.

Conclusions: We found a moderate incidence of recurrence in resected lymph node–negative pulmonary adenocarcinoma. Tumor size ≥ 4 cm, visceral pleural invasion, tumor necrosis, and bronchial resection margin < 2 cm are the significant prognostic factors of tumor recurrence in lymph node-negative pulmonary adenocarcinoma. These prognostic factors may serve as important clinic-pathological characteristics in determining the outcome of these patients.

Keywords: Early stage lung cancer, Lymph node-negative, Prognostic factors, Recurrence, EGFR mutation
A Pilot study of using Smartphone Application Versus Routine follow up for patients care in Advanced Non-Small Cell Lung Cancer (NSCLC)

K. Udomdamrongkul, K. Seetalarom, K. Peechatanan, S. Saichaemchan, N. Prasongsook

Medical Oncology Unit, Department of Medicine, Phramongkutklao Hospital

**Background:** There are many promising data supporting that web-based patient reported outcome (PRO) improved quality of life (QoL), progression free survival (PFS), and overall survival (OS) in patients with advanced NSCLC who were treating with specific therapy. Lung Cancer Care application is a mobile application program that provides patients with individually tailored information on patient reported outcome. This study aims to invent a new mobile application evaluating PRO for Thai NSCLC patients, and to evaluate the validity of mobile application.

**Methods:** Our mobile application-based PRO under the name of “Lung Cancer Care application” was designed for monitoring quality of life and adverse events from specific treatment. The validity of the application was tested following guidelines for translating, and validating a questionnaire. Moreover, we compared the outcome of progressive disease (PD) between this application and the results from standard CT scan. The quality of life score (FACT-L score) and five different symptoms score were contained in the mobile application-based PRO, which was based on self-scored patient symptoms. After the validated mobile application-based PRO was tested, patients with advanced NSCLC were randomly assigned to use mobile application-based PRO versus routine follow-up. The primary endpoint was to compare quality of life (QoL) score between two groups, which focused on changing of FACT-L score at baseline and 3 months after randomization. Secondary endpoint was OS.

**Results:** From August to December 2018, thirty-three patients with advanced NSCLC were enrolled. The mean of FACT-L score at baseline in mobile application-based PRO arm and routine follow up arm was similar (90.08 ± 5.66 vs 91.78 ± 5.26, p-value=0.82). Patients with mobile application group had more FACT-L score at 3 months than patients with routine follow up arm (106 ± 5.97 vs 99.96 ± 5.74, p-value = 0.07). There was a trend towards increased in different mean of FACT-L score at baseline and 3 months in patients with mobile application compared to patients with routine follow up (p-value = 0.05). The median follow-up time was 5.43 months, patients with mobile application had longer median OS than patients with routine follow up (4 months vs 2.9 months, p-value = 0.5). The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of this application for predicting disease progression were 50%, 83.3%, 66.7%, and 70% respectively.

**Conclusions:** Lung Cancer Care application based on self-reported symptoms is a novel electronic device for real-time patient care monitoring. Our study results showed trend towards improved quality of life from using this novel mobile application. However, there was small samples for pilot testing, the relatively large sampling errors may reduce the statistical power needed to validate this tool.

**Keywords:** Advanced non-small cell lung cancer (NSCLC), Mobile application, Patient reported outcome (PRO)
No survival benefit of adding methotrexate for localized osteosarcoma in adult

Panuch Eiamprapaporn 1, Aumkhae Sookprasert 1, Kosin Wirasorn1, Piti Ungareevittaya 2, Jarin Chindaprasirt 1

1 Medical oncology unit, Faculty of medicine, Khon Kaen University, Khon Kaen, Thailand
2 Department of pathology, Faculty of medicine, Khon Kaen University, Khon Kaen, Thailand

**Background:** Osteosarcoma is the most common primary bone cancer in young adults. The standard treatment for localized disease is surgery and chemotherapy with MAP (Methotrexate, Adriamycin, and Cisplatin) regimen. However, the benefit of adding methotrexate is unclear.

**Objectives:** To compare survival benefit between MAP and AP regimen in localized osteosarcoma.

**Methods:** Clinical data of patients aged > 15 years diagnosed with osteosarcoma between January 2000 and December 2015 at Srinagarind Hospital, Khon Kaen University were retrospectively reviewed. Treatment modality and outcomes were obtained.

**Results:** A total of 114 patients (M: F=74:40) were enrolled. The median age at diagnosis was 19 years old (range 15-70) and the most common primary site was a distal femur. The median survival time of the overall cohort was 37.5 months (95% CI: 27.4-60.8). There was no survival benefit of MAP over AP regimen (HR 1.22, 95%CI 0.62-2.39, p=0.57). Multivariate analysis showed that patients older than 65 years old (adjusted hazard ratio) and no definitive surgery (HR13.65; 95% CI 1.43-129.83; p= 0.023) were significantly associated with worse overall survival.

**Conclusions:** In neoadjuvant setting osteosarcoma, the MAP regimen did not show superior efficacy to the AP regimen in terms of overall survival.

**Keywords:** Osteosarcoma, Adult, Methotrexate, Neoadjuvant, Chemotherapy
The Prevalence of Vitamin D Deficiency in Thai Cancer Patients, its Dynamics and Association with Cancer Survival

Chavapon Ngokngarm, Chanyoot Banditwattanawong

Department of Medical Oncology, Faculty of Medicine, Vajira Hospital, Navamindradhiraj University

Background: Vitamin D deficiency is associated with various kinds of cancer. Moreover, vitamin D level possibly has an inverse relationship with cancer mortality. The data on vitamin D status among Thai cancer patients and its association with cancer survival are scarce.

Objectives: The primary outcome was to determine the prevalence of vitamin D deficiency among unselected Thai cancer patients. The secondary outcomes were to explore the effect of cancer treatment upon vitamin D status, the independent predictive factor(s) of vitamin D deficiency among cancer patients and its potential independent factor of cancer survival.

Materials & Methods: There were 106 consecutive cancer patients participated in this prospective descriptive study conducted at Division of Medical Oncology. Vitamin D (25(OH) D) levels were collected before and after cancer treatment. Demographic data, vitamin D status, and treatment outcomes were collected and analyzed.

Results: There were 106 consecutive cancer patients participated in this study. Determination of vitamin D status after cancer treatment were obtained in 76 patients. The investigators found that almost all of the cancer patients had vitamin D deficiency (102 of 106, 96.2%). Determination of vitamin D status after cancer treatment were obtained in 76 patients. The investigators did not demonstrate the significant change of vitamin D level (mean change = -1.46 (95% C.I., -3.33-0.41), p = 0.124) when the blood samples were collected before and after cancer treatment. Therefore, cancer treatment was unlikely to affect the vitamin D status. There was a trend towards inverse relationship between the BMI and vitamin D level. At the median follow-up time of 254.5 days (IQR 220-297), the investigators revealed that low BSA (BSA < 1.5 m2), PS 2 at presentation and very low vitamin D level (< 10 ng/ml) were the independent predictive factors of survival, according to the multi-variate analysis.

Conclusions: Nearly all Thai cancer patients have vitamin D deficiency. Cancer treatment does not affect the vitamin D status. Low serum vitamin D level does not affect survival outcome.

Keywords: Vitamin D deficiency, prevalence, cancer, survival
Pre- and Post-Surgery Metabolomic Profiles in Early-Stage NSCLC Patients

Wannisa Laosuangkoon 1, Songporn Oranratnachai 1,2, Nitchawat Paiyabhroma 3, Laor Chailurkit 3, Dittapol Munthum 4, Narumol Trachu 3, Pintip Sanvarinda 5, Boonsong Ongphiphadhanakul 6, Thanyanan Reungwetwattana 1

1 Division of Medical Oncology, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2 Section for Clinical Epidemiology and Biostatistics, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
3 Research Center, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
4 Department of Mathemetic, Faculty of Science and Technology, Rajamangala University of Technology Suvarnabhumi, Thailand
5 Department of Pharmacology, Faculty of Science, Mahidol University, Bangkok, Thailand
6 Division of Endocrinology and Metabolism, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Finding biomarkers to detect cancer at its early stage is of importance. Since metabolic reprogramming is a hallmark of cancer, oncometabolite is thus a promising target. Progress in cancer metabolomics opens the door for extensive scale screening of cancer-specific metabolites that could be future applied for subclinical stage detection and novel therapeutic targets.

Methods: Seventy paired pre- and postoperative plasma samples of early-stage non-small cell lung cancer (NSCLC) patients who had completed curative surgery during 2015-2018 with ≥ 3 months of disease-free were retrieved. Demographic and Clinical data were collected. All samples were subjected to targeted metabolomics analysis using AbsoluteIDQ® p180 Kit combined with Flow injection analysis and Liquid chromatography tandem mass spectrometry. Multivariate analysis including Principal Components Analysis (PCA) and Orthogonal Partial Least Squares Discrimination Analysis (OPLS-DA) were used to identify the difference between pre- vs. post-operative sample set. T-test was used to confirm if the metabolites significantly different among groups at the univariate level (p < 0.05).

Results: Of the 70 patients, 31 (44.3%) were male and 39 (55.7%) were female. Median age was 63 years old (23 - 85). Majority of them were never-smokers (64.3%). Adenocarcinoma was the most common histology (91.4%). EGFR mutation was tested in 34 (48.6%) patients, of which, 22 (64.7%) of them were positive. OPLS-DA showed that pre- and post-operative metabolites distinguish into 2 different groups. Metabolomic analysis revealed tryptophan as the highest positive fold change comparing before and after surgery, together with other amino acids, carnitine, biogenic amines, and lipids (p<0.001). Glutamate was the only one metabolite that significant decreased after surgery. Kynurenene and tryptophan ratio were significant decrease in postoperative patients (p<0.001). The most significant fold change metabolites (tryptophan, lysophosphatidylcholine-acyl C16:0,carnitine,glutamate) were assembled for a predictive model which sum of total score more than 29 correspond to high probabilities prediction of the persistence of lung cancer in early stage lung cancer patients before and after surgery.

Conclusions: We identified a distinct cluster of significant metabolic biomarkers associated with early-stage NSCLC. These metabolites would be the potential important biomarker profile for early-stage NSCLC detection. A larger cohort is needed to be validated.

© by Thai Society of Clinical Oncology
Keywords: Metabolomics, early stage non-small cell lung cancer
Differential Expression of Immune-Regulatory Protein on Peripheral Blood Mononuclear Cells in Advanced Stage Non-Small Cell Lung Cancer Patients

Chirawadee Sathitruangsak 1,2, MD., Siriporn Khunsri 1, MS., Chanida Vinayanuwattikun 1, MD., Ph.D., Poonchavist chantranuwat 3, MD., Virote Sriuranpong 1, MD., Ph.D., Apiwat Mutirangura 4, MD.,Ph.D.

1 Division of Medical Oncology, Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University and the King Chulalongkorn Memorial Hospital, Bangkok, 10330, Thailand;
2 Holistic Center for Cancer Study and Care (HOCC-PSU) and Division of Medical Oncology, Department of Internal Medicine, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkhla, 90110, Thailand;
3 Department of Pathology, Faculty of Medicine, Chulalongkorn University and the King Chulalongkorn Memorial Hospital, Bangkok, 10330, Thailand;
4 Center for Excellence in Molecular Genetics of Cancer and Human Diseases, Department of Anatomy, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.

Background: An accurate diagnostic biomarker for identifying early stage non-small cell lung cancer (NSCLC) is essential to improve the treatment outcome and reduce mortality. Peripheral blood mononuclear cell (PBMC) have been shown to offer potential information related to the presence of disease, including prognosis and treatment response. Recent studies have reported the feasibility of using PBMC gene expression signature for early detection of cancer. In this study, we investigated whether immune-related protein expression on PBMC could discriminate between patients with and without NSCLC.

Methods: This study was divided into three phases: (1) candidate protein discovery using available published data on RNA expression on PBMC in NSCLC patients; (2) protein selection and validation by immunofluorescence staining on PBMC from patients with advanced stage NSCLC, along with PBMC from healthy individuals as controls; and (3) independent validation using flow cytometry on a set of PBMC from 30 patients with advanced stage NSCLC and 30 healthy controls.

Results: Of the panel of 5 immune-related proteins analyzed (CLEC4A, CLEC4D, C5AR1, NLRP3, and S100A12), we have observed the significantly increased expression of CLEC4A, CLEC4D and NLRP3 in NSCLC group. Using the same threshold, mean fluorescence intensities of specific-antibody staining on CD3+ lymphocytes in NSCLC patients compared with non-cancer individuals were 810.06 428.4 vs 698.38 344.0, 1,091.52 522.5 vs 916.02 454.4 and 1,030.49 458.6 vs 742.95 203.5 for CLEC4A, CLEC4D and NLRP3, respectively (p < 0.001). On the contrary, the expression of C5AR1 and S100A12 were decreased in NSCLC when compared to control group [919.67 256.6 vs 1,428.75 407.0 (p < 0.001) and 2,219.30 327.0 vs 2,502.44 429.5 (p=0.03), respectively].

Conclusions: Diverse immune-related protein expressions on PBMC between NSCLC patients and healthy control could be a potential non-invasive strategy of lung cancer detection in the future.
Efficacy of treatment of metastatic non-small cell lung cancer in patients harboring EGFR mutation with first-line EGFR Tyrosine kinase inhibitors in Siriraj hospital

Dheeravee Ratanapichayachai, SirisophaTechawattanawanna, PongwutDanchaivijitr
Division of Medical Oncology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University

Background: The discovery of epidermal growth factor receptor (EGFR) activating mutations as oncogenic drivers led to the development of EGFR-tyrosine kinase inhibitors (TKIs) and contribute to the advancement of non-small cell lung cancer (NSCLC) treatment. First and second-generation EGFR TKIs have shown similar efficacy in many studies and meta-analysis, except data from phase II LUX-Lung7 which showed the superiority of afatinib over gefitinib in progression-free survival and time to treatment failure but not for overall survival. Our study was designed to evaluate the efficacy, safety and clinical outcomes of advanced NSCLC which harbored EGFR activating mutation, treated with first and second generation EGFR TKIs in the first-line setting by analyzing real-world data from a large medical center in Thailand.

Methods: We conducted the retrospective chart review to examine demographics, disease characteristics, and clinical outcomes of patients with locally advanced unresectable or metastatic NSCLC which harbored EGFR activating mutation, treated with EGFR TKIs in the first-line setting. Demographic and clinical characteristics were analyzed. Outcomes evaluated were progression-free survival and overall survival.

Results: Among the total of 266 patients treated with EGFR TKIs, 58 received afatinib, 150 received gefitinib and 58 received erlotinib. Median PFS was 18.1 months (95% CI 12.9–23.4) in the afatinib group, 10.6 months (95% CI 9.9–11.3) in gefitinib group and 10.8 months (95% CI 8.5–13.2) in erlotinib group. Patients who received afatinib had a significantly longer progression-free survival (PFS) than patients who received gefitinib (HR 0.58, 95%CI 0.37-0.90; p=0.015) and erlotinib (HR 0.57, 95%CI 0.35-0.93; p=0.023). The median overall survival (OS) was 26.0 months (95% CI 14.0–38.1) in the afatinib group, 24.6 months (95% CI 17.8–31.4) in gefitinib group and 20.8 months (95% CI 15.9–25.7) in erlotinib group. Overall survival was not significantly different among patients who received afatinib compare with gefitinib (HR 1.06, 95%CI 0.61-1.84; p=0.834) and erlotinib (HR 0.77, 95%CI 0.43-1.38; p=0.382).

Conclusions: In patients with locally advanced unresectable or metastatic NSCLC harboring EGFR mutation, treated with EGFR TKIs in the first-line setting, patients who received afatinib had a significantly longer progression-free survival and numerically longer overall survival. However, with a small patient number and retrospective in nature, additional analyses may be needed to validate our result.
Objectives: Owing to the high mortality and rapidly growing costs related to lung cancer, it is worth examining the health benefits of treatment in this cancer. This study attempts to quantify the real-life practice quality-adjusted life expectancy (QALE) of non-small cell lung cancer (NSCLC) patients with different stages and systemic treatments.

Materials & Methods: This cross-sectional study was conducted by reviewing and collected quality of life (QoL) data from 256 eligible all stages NSCLC patients treated at Rajavithi hospital from May 1st to October 31st, 2018. The iSQoL statistical package was used to evaluate QALE compared with the reference Thai population in different stage of disease. For advanced stage, QALE was compared among treatment groups (chemotherapy and epidermal growth factor receptor tyrosine kinase inhibitors; EGFR TKIs).

Results: The QALE for patients with early and advanced stage NSCLC were 4.49 ± 0.43 and 1.03 ± 0.08 QALY, with the corresponding loss-of-QALE were 14.02 ± 0.44 and 20.13 ± 0.09 QALY, respectively. The difference of QALE between early and advanced stage was 3.46 QALY (p<0.001). Based on systemic treatment in advanced stage, The QALE for patients who received chemotherapy and EGFR TKIs were 1.05 ± 0.08 and 2.19 ±0.28 QALY, with the corresponding loss-of-QALE were 20.48 ± 0.09 and 19.12 ± 0.29 QALY, respectively. The difference of QALE between treatment with chemotherapy and EGFR TKIs was 1.17 QALY (p=0.001).

Conclusions: The utility gained from treatment with EGFR TKIs in advanced NSCLC is substantial. Early stage had better QALE than advanced stage NSCLC patients which emphasized the importance of early detection and diagnosis of lung cancer. Future study will assess the cost-effectiveness of targeted therapy in Thailand.

Keywords: Non-small cell lung cancer, quality-adjusted life expectancy
Exploratory elemental analysis of lung cancer tissue in Maharaj Nakorn Chiang Mai hospital

Thanika Ketpueak, Busayamas Chewasakulyong, Apichat Tantraworasin, Yoshiyuki Tohno, Pasuk Mahakanukrauh, Nirush Lertprasertsuke

Division of Medical Oncology, Department of Internal Medicine, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Background: Lung cancer is most common cancer worldwide and also the leading cause of cancer death in Thailand. There are many associated risk factors causing lung cancer, for example, smoking, cooking fume, occupational exposure, radon exposure, and heavy metals. Moreover, stepwise carcinogenesis and molecular alteration play an important role in cancer development that have been clearly establish. The evaluation of fundamental component of lung cancer like trace elements and stable isotope ratio is still scarce. This prospective study aimed to study the trace element from tissue to detect the difference between lung cancer tissue and normal tissue from lung cancer patients

Methods: Lung cancer patients were collected both lung cancer specimen and normal lung tissue specimen from curative surgery and all specimen were evaluated by inductively coupled plasma-mass spectrometry (ICP-MS) and measure 10 elements which are calcium (Ca), phosphorus (P), sulfur (S), magnesium (Mg), zinc (Zn), ferrous (Fe), sodium (Na), nickel (Ni), copper (Cu) and Lead (Pb). Furthermore, the specimens are measured for nickel isotope ratio, copper isotope ratio, and Pb isotope ratio. This study aimed to define the difference of composition in lung cancer tissue and normal lung tissue.

Results: During November 2017 to February 2019, 18 patients were recruited. We reported preliminary analysis from 12 specimens, 9 were lung cancer tissue and 3 were normal tissue. There was no difference between lung cancer tissue and normal tissue from both trace element analysis and stable isotope ratio. Among 9 lung cancer tissues, there were significantly lower zinc and calcium level in smokers compared to non-smokers. Median value (interquartile range, IQR) of zinc level is 54.55 µg/g (0 - 64.39) and 82.14 µg/g (69.85 -104.48) and geometric mean difference was -0.33 (95% CI = -0.99, +0.33), p-value 0.07. Median value (IQR) of Calcium level was 1.83 mg/g (1.71 – 1.94) in smoker and 2.58 mg/g (1.53 – 3.66) and geometric mean difference was -0.28 (95% CI =-1.18, +0.61), p = 0.19. Moreover, there was significantly lower Nickle isotope ratio 60/58 in PD-L1 positive patients compared to PD-L1 negative patients ( Median value (IQR) =7.36 (0 - 14.56) versus 17.56 (15.86 – 19.57) respectively, geometric mean difference = 0.51 (95%CI - 0.13, +1.14),p-value 0.019. However, small sample size might affect the results.

Conclusions: There was no significant difference of between lung cancer tissue and normal tissue as well as Cu, Ni, Pb isotope ratio. In our study is only preliminary analysis and now the rest of samples from 9 patients are evaluating in Japan. After gathering and analyzing all information, we might detect the difference of trace element and also the Cu, Ni, Pb isotope ratio. We try to report the full analysis soon.
Excision repair cross-complementation group 1 and 2 (ERCC1/2) variants and chemotherapy treatment outcome in Cholangiocarcinoma

Thanachai Sanlung 1,2, Kosin Wirasorn 2, Suda Vannaprasaht 3, Prakasit Sa-ngiamwibul 4, Aumkhae Sookprasert 2, Jarin Chindaprasirt 2, Narong Khuntikeo 5, Attapol Titapun 5, Sarinya Kongpetch 3, Areerat Dornsena 3

1 Medical oncology fellowship, 2 Medical oncology unit, Department of internal medicine, 3 Department of Pharmacology, 4 Department of Pathology, 5 Department of Surgery, Khon Kaen University, Khon Kaen, Thailand

Introduction: LERCC1 and ERCC2 are major enzymes involved in nucleotide excision repair (NER). Single nucleotide polymorphisms (SNPs) affect the mRNA level and stability resulting in an alteration in protein translation. ERCC1/2 SNPs potentially association with survival in various cancers but the data in CCA was limited.

Methods: We did a retrospective review and genomic DNA analysis from FFPE tissue of patients diagnosed locally advanced or metastatic CCA who received palliative chemotherapy. The target variants included ERCC1 C19007T, C8092A and ERCC2 C312T, A2251C.

Results: Genomic DNA analysis was done in 64 patients but only 54 patients received platinum-based chemotherapy were use in the survival analysis. The ERCC1 C19007T CT variant had a trend to have better OS than wild-type (CC), 8.8 vs 6.3 months respectively, the HR was statistically significant in multivariate survival analysis (HR 0.47 (0.23-0.94), p=0.032). The ERCC1 C8092A both homozygous (AA) and heterozygous (CA) variants had shorter OS compare with wild-type (CC), 6.2, 8.0 and 9.5 months respectively, there was a trend to statistically significant between CT and CC group HR 1.83 (0.96-3.51), p=0.067. These findings also observe in response rate and disease control rate. Conversely, ERCC2 variants did not associate with the outcome.

Conclusions: ERCC1 C19007T and ERCC1 C8092A variants are associated with the overall survival but not the ERCC2 variants in cholangiocarcinoma patients receiving platinum-based chemotherapy. Longer survival is seen in ERCC1 C19007T heterozygous variant (CT) but shorter in ERCC1 C8092A variants.

Keywords: Single nucleotide polymorphisms, excision repair cross-complementation group 1 and 2, Cholangiocarcinoma, C19007T, C8092A, C312T, A2251C
Recurrent colorectal cancer: clinical presentation and mode of detection

Tanarat Ruchakorn, Ekaphop Sirachainan
Division of Oncology, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Introduction: Active surveillance after colorectal cancer (Stage I-III) treatment with curative intent aims to detect recurrences. The objective of this study is to assess how recurrent disease presents and is diagnosed within scheduled follow-up according to the Faculty of Medicine Ramathibodi Hospital, and to determine how much different in survival benefit between symptomatic and asymptomatic patients.

Methods: In a retrospective study of consecutive patients with colorectal cancer who were treated in Faculty of Medicine Ramathibodi Hospital, we identified patients with colorectal cancer who underwent surgery with curative intent between January 2013 and December 2016. Patients who developed recurrent disease were included for further analyses.

Results: From a total of 1096 patients who were been treated for colorectal carcinoma (Stage I-III) with curative intent, 184 developed recurrent disease (16.7%). In 155 of those patients (84.2%), recurrent diseases were detected during a scheduled follow-up visit, being asymptomatic. Tumor marker testing, imaging, and colonoscopy identified all of these recurrences. In the remaining 29 patients with recurrent disease (15.7%), recurrence was found during non-scheduled interval visits; patients were symptomatic. The most prevalent symptoms were gut obstruction and abdominal mass. Patients with asymptomatic recurrences had significantly higher overall survival compared with patients with symptomatic recurrences (45.2 months vs. 28.4 months, HR 2.4 (95% CI 1.52 - 3.87) p = 0.0006). Patients with asymptomatic recurrences had a significantly longer time to treatment compared with patients with symptomatic recurrences (1.6 month vs. 0.5 month, HR 1.85 (95% CI 1.23 - 2.17) , p = 0.003).

Conclusions: Active surveillance after adjuvant therapy in colorectal cancer (Stage I-III) could prolong survival of the patients with recurrent disease due to the detection of resectable metastatic disease. Early detection of recurrent disease during asymptomatic period could prolong survival than late detection when symptom occurred.
Clinicopathological Characteristics and Survival Outcomes of Adolescent and Young Adult-Onset Sporadic Microsatellite Stable Colorectal Cancer in Thai Population

Kanjana Sukhokjananachusak ¹, Charuwan Akewanlop ¹, Ananya Pongpaibul ², Akarin Nimmanit ³, Krittiya Korphaisarn ¹,*

¹ Division of Medical Oncology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
² Department of Pathology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
³ Division of Clinical Epidemiology, Office for Research and Development, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
* Corresponding author

Background: The incidence of colorectal cancer (CRC) is increasing in adults aged younger than 50 years. This study evaluated the clinicopathological characteristics and survival outcomes of adolescent and young adult (AYA)-onset sporadic CRC and outcome in Thai population.

Methods: Medical records of patients who were diagnosed with primary colon or rectal adenocarcinoma at Siriraj Hospital during 2007 to 2018 were retrospectively reviewed. Patients were classified into either the AYA-onset CRC group (age 15-39 years) or the adult-onset CRC group (age >50 years). Associations between sporadic microsatellite stable (MSS) AYA-/adult-onset CRC and clinicopathological features and survival outcomes were evaluated.

Results: A total 202 patients were diagnosed with AYA-onset CRC with no known history of familial CRC syndromes. Of those, 116 had data on mismatch repair status, and 94 were confirmed MSS CRC. AYA-onset CRC patients had more left-sided than right-sided tumors (77.7% vs. 21.8%), and more late-stage than early-stage disease (72.7% in stage III-IV vs. 24.7% in stage I-II). Compared to adult-onset disease, AYA-onset MSS CRC had a higher proportion of female gender (p=0.042), signet ring cell/mucinous histology (p=0.039), and perineural invasion (p=0.004). Male gender and mucinous/signet ring cell histology were significantly associated with worse overall survival (OS) in both univariate and multivariate analysis. There were no differences between groups for overall or disease-free survival.

Conclusions: Sporadic MSS AYA-onset CRC in Thai patients was associated with female gender and aggressive pathological characteristics. No difference in survival outcome was observed between the AYA-onset and adult-onset groups.

Keywords: Colorectal cancer, adolescent and young adult onset, sporadic, microsatellite stable, clinical characteristic, outcome
Tumor Genetic Mutation Profiles in Colorectal Liver Metastasis Patients with Early Recurrence and Long-term Disease Free after Hepatic Resection

Sarit Arayapong, M.D. 1, Suebpong Tanasanvimon, M.D. 1

1 Department of Medicine, King Chulalongkorn Memorial Hospital, Bangkok, Thailand

**Background:** Surgical resection of colorectal liver metastases (CRLM) improves survival and provides the chance for cure. However, about half of patients have recurrence after hepatic resection. The aim of this study was to explore tumor genetic profiles in CRLM patients with early recurrence (ER) and long-term disease free (LF) after complete hepatic resection.

**Methods:** Among CRLM patients undergoing complete hepatic resection at King Chulalongkorn Memorial Hospital during January 2007 – April 2019, the patients with ER (<6 months) and LF (>3 years) were identified. Whole Exome Sequencing was run on tumor samples from liver resection specimens. Genetic alterations of KRAS, NRAS, BRAF, PIK3CA, APC, CTNNB1, SMAD4, MLH1, MSH2, MSH6 and PMS2 were analyzed.

**Results:** Among 521 patients with CRLM undergoing hepatic resection, 20 eligible patients with ER and 19 eligible patients with LF were identified. For clinicopathological analysis, as compared to long-term disease free group, there were significantly more number of liver metastasis (p = 0.02) and pre-operative treatments (P = 0.006) in early recurrence group. Eighteen patients including 11 ER and 7 LF were complete whole exome sequencing analysis. There were more patients with NRAS mutation (18.2% vs 0%, p=0.5) and less MMR gene mutations (9.1% vs 28.6%, p=0.53) in patients with ER. Copy-number variation (CNV) analysis showed differences of amplification or deletion in KRAS, NRAS ,BRAF, CTNNB1,PMS2 and MLH1 gene between the two groups but no statistical significance.

**Conclusions:** As compared with CRLM patients with LF, there were more NRAS mutation but less MMR gene mutation frequencies in CRLM patients with ER but no statistical significance. Result need to be validated in larger population.

**Keywords:** Prognostic factors, Colorectal Cancer, Liver Metastasis, Hepatic Resection
Incidence of oxaliplatin hypersensitivity infusion reaction after premedication with dexamethasone, histamine-1 and -2 blockers in patients who retreated with oxaliplatin, a prospective study

Thichakarn Jhunthasiriyanorn, MD 1, Suebpong Tanasanvimon, MD 1

1 Division of Medical Oncology, Department of Internal Medicine, Faculty of Medicine, Chulalongkorn University and the King Chulalongkorn Memorial Hospital, Bangkok, 10330, Thailand.

Objectives: The incidence of oxaliplatin hypersensitivity infusion reaction was higher in patients who received retreated oxaliplatin-based chemotherapy. We investigated the incidence of hypersensitivity infusion reaction (HSR) in patients receiving additional histamine 1 and 2 blockers as premedication.

Methods: Patients receiving retreated oxaliplatin-based regimens were enrolled. Dexamethasone, histamine 1 (H1) and 2 (H2) blockers were given as premedication in every subject every 30 minutes before every cycle. The incidence and grading of hypersensitivity infusion reaction were recorded.

Results: During February 01, 2018 to April 20, 2019, thirty-five patients receiving retreated oxaliplatin regimens were enrolled. There were five (14.28%) patients having HSR. The HSR severity was grade I in one patient, grade II in three patients and grade III in one patient. The HSR was resolved by steroid and additional H1 blocker. There was no patient discontinuing the treatment because of HSR.

Conclusions: Dexamethasone, H1- and H2 blocker premedication seemed to reduce the incidence of HSR in patients receiving retreated oxaliplatin.

Keywords: Hypersensitivity infusion reaction, Oxaliplatin retreatment

Abbreviation: Hypersensitivity infusion reaction (HSR), Eastern Cooperative Oncology Group performance status (ECOG), Common Terminology Criteria for Adverse Events (CTCAE)
Reliability, validity and feasibility of the Thai translation (Thai G8) of the G8 screening tool in geriatric oncology

Sarunkorn Sakchinabut, MD 1, Suchira Chaiviboontham, RN 2, Thanyanan Reungwetwattana, MD 1, Siriporn Semsarn, APN 3, Intira Mahaweranon, RN 3, Phichai Chansriwong, MD 1

1 Division of oncology, department of medicine, Faculty of medicine  
2 Ramathibodi School of nursing  
3 Ramathibodi Palliative care Center  
Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

**Background:** A comprehensive geriatric assessment (CGA) is recommended method in determine the medical, psychological, and functional capabilities of elderly patients but it is a time-consuming tool to use in clinical practice. G8 screening tool is a quick and simple tool to screen elderly cancer patients. The aims of this study were to identify reliability, validity and feasibility of the Thai translation (Thai G8), including sensitivity, specificity and optimal cutoff point score Thai G8.

**Methods:** Thai G8 was translated from G8 tool and evaluated for content validity. The reliability was performed in 2 times, 2 weeks apart. Sensitivity and specificity were evaluated in new diagnosed patients who received chemotherapy comparing who received standard and adjusted dose. Feasibility was done by surveyed in doctors and nurses.

**Results:** Thai G8 had excellent content validity (content validity index was 1). 76 elderly patients were enrolled. Time-consuming for assessment were 5 minutes. Mean score of Thai G8 was 12 (4.5-17). 74% of patients had score ≤ 14 which defined as abnormal. Mainly causes of lowering score were malnutrition, low BMI and polypharmacy. The reliability was high (the intra-class correlation coefficient was 0.97). 20 newly diagnosed patients were evaluated for sensitivity and specificity. At cutoff point ≤ 14, sensitivity was 66.7% and specificity was 35.7%. But at cutoff point < 11, Thai G8 showed higher specificity (85.7%). 34% of patients had score < 11. For feasibility, 82.6% of participants accepted Thai G8 feasibly in using Thai G8 as a screening tool in elderly patient and helped in decision making for treatment.

**Conclusions:** Thai G8 had excellent reliability, validity and feasibility. Three-fourth of Thai elderly patients had abnormal score in Thai G8 and required CGA directed interventions. The adjusted cut-off point score < 11, showed higher specificity in chemotherapy intolerability. Most of patients had problems in malnutrition and polypharmacy.
Background: Risk factors of cisplatin induced acute kidney injury (AKI) patients has been well described. In HNSCC, an incidence of cisplatin induced AKI was observed in 34.2%. Most studies reported AKI as a surrogate endpoint. However, delayed cisplatin induced nephrotoxicity and long term renal outcomes were not well studied.

Methods: Locally advanced HNSCC patients treated between 1/2007 and 12/2018 who underwent definitive or post-operative chemoradiotherapy (CRT) with cisplatin were identified. Patient characteristics, treatments, creatinine at baseline, during, 3-, 6-, and 12 months after CRT completion were retrospectively reviewed. Acute kidney disease (AKD) was defined by (i) estimated glomerular filtration rate (eGFR) <60 ml/min/1.73 m2 for <3 months, or (ii) decrease in eGFR by ≥35 %, or (iii) increase in serum creatinine by >50 % for <3 months.

Results: A total of 509 patients were analyzed. Overall AKD occurred in 27.9% patients. Most patients (95%) had prophylaxis feeding. ECOG of 0 was more prominent in AKD patients (p=0.017), diabetes (p=0.044), and hypertension (p<0.001). Most patients received definitive CRT (83%) with mean cumulative dose of cisplatin during CRT and entire treatment of 189, and 399.57 mg/m2, respectively. There was no statistically different in cumulative dose, delay, dose reduction, termination, and hospitalization. In AKD patients, eGFR started to decline significantly during CRT (-36%) and worsening at 3 months (-39%) after CRT. The eGFR started to improve at 12 months after CRT (-29%), but not recovered to baseline nor non-AKD patients. In multivariate analysis, ECOG of 0 (OR=1.77), and hypertension (OR=2.25) were a significant predictive factor for AKD.

Conclusions: Almost one third of locally advanced HNSCC patients who underwent CRT with cisplatin developed AKD with the peak incidence at 3 months after CRT. After 1 year, eGFR of patients with AKD did not recovered, and remained at -30% decline from baseline. ECOG 0 and hypertension were a predictor for AKD, while cumulative dose of cisplatin was not. Physician's awareness of AKD and underestimation of potential complications in fit patients might have explained these findings.
Survival of Hormone Receptor-Positive, HER2-negative Metastatic Breast Cancer that had Progressed on Previous Nonsteroidal Aromatase Inhibitors with or without Everolimus and Exemestane Combination

Thanate Dajsakdipon 1, Jitprapa Konmun 2, Umaporn Udomsubpayakul 3, Thitiya Dejthevaporn 1,*

1 Division of Oncology, Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
2 Department of pharmacy, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
3 Section for Clinical Epidemiology and Biostatistics, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand

Background: Everolimus combined with exemestane has been shown to improve progression free survival (PFS) in patients with endocrine-resistant metastatic breast cancer (MBC). The regimen has been well-accepted despite lack of survival benefit. In real-life setting, patients were not well-selected and hence benefit of such treatment may not be as robust.

Methods: This is a retrospective review of 143 hormone receptor (HR) positive, human epidermal growth factor receptor type 2 (HER-2) negative MBC patients(pts) in Ramathibodi cancer registry progressing on nonsteroidal aromatase inhibitors (NSAI). Pts who received everolimus/exemestane combination in any lines of therapy (EE group) were compared to no everolimus (NE group). The primary end point was overall survival (OS) adjusted to prognostic factors. Secondary end points were subgroup analysis of OS and progression-free survival of the cohort.

Results: There were 52 pts in EE group and 91 pts in NE group. Mean age was 58.6 years. Majority had Eastern Cooperative Oncology Group score 0-1 and < 2 metastatic organ-sites (76%). Visceral involvement in EE and NE were 79% and 67%, respectively (p = 0.13). Sixty-six and 58% of EE and NE, respectively, were treated with first line NSAI (p = 0.56). Three-quarters of patients received everolimus 10 mg daily with 44% required dose reduction. Median follow-up time was 51 months. Unadjusted median OS was significantly longer in EE [33 vs. 25 months, hazard ratio (HR), 0.66 (95%CI 0.44-0.998); p = 0.049]. In univariate analysis, factors affecting survival included numbers of metastatic sites, presence of bone metastasis, treatment with EE, and numbers of line of treatment after NSAI failure. Factors that remained significant upon multivariate analysis were numbers of line of treatment [HR 0.71 (95%CI 0.63-0.79); p < 0.05] and numbers of metastatic site [HR per one site increase 1.35 (95%CI 1.05-1.73); p = 0.02]. Median numbers of treatment line after NSAI failure was 5.2 vs 3.6 lines in EE and NE, respectively. Median OS in those treated with EE in first (N=14), second (N=18) and third (N=20) line after NSAI-failure were 23, 21 and 38 months, respectively, compared to 25 months with NE [HR 0.91, 0.74, 0.499; (p = 0.16, log rank)]. PFS in pts receiving EE as first Rx after NSAI was numerically longer compared to those who received other agents (capecitabine, taxanes, fulvestrant, exemestane) after NSAI [10 vs. 4-7 months, p >0.05].

Conclusions: In this real-life practice data, pts with hormone receptor positive, HER-2 negative MBC who had progressed on NSAI, the sequential use of multiple treatment regimens of endocrine and chemotherapy is an essence to longer survival. Everolimus/ exemestane may have contributed, to a lesser extent, to improvement in survival. Efficacy of EE appeared to be maintained when used in later line of treatment in these heavily pretreated patients.
Keywords: Breast cancer, endocrine resistance, endocrine refractory, everolimus, metastatic breast cancer
Prognostic significance of cyclin B1 expression plus clinicopathologic features in hormonal positive, HER2 negative early breast cancer in King Chulalongkorn Memorial Hospital During 2010-2015

Takonkitsakul K. 1*, Thanakit V. 2, Poovarawan N. 1, Uttamapinan S. 1, Sriuranpong V. 1, Parinyanitikul N. 1

1 Division of medical oncology, Department of Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
2 Department of Pathology, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Background: Approximately one third of hormonal receptor (HR) positive, HER2 negative early breast cancer reported disease relapse after adjuvant treatments. Both clinicopathologic features and multigene assays consider to be predicting factor of relapse. Cyclin B, one of proliferative markers used in OncotypeDx has been explored previously for predicting recurrence in this subgroup of breast cancers. Our study aims to determine the prognostic significance of cyclin B1 in combination with clinicopathologic factors in recurrent HR positive, HER2 negative breast cancer.

Methods: Two-hundred and fourteen HR positive, HER2 negative early breast cancers who were diagnosed during 2010 to 2015 in King Chulalongkorn Memorial Hospital were retrospectively reviewed. All clinicopathologic factors and level of cyclin B1 expression were evaluated. Correlation of cyclin B1 expression with clinicopathologic features was also compared in recurrence and non-recurrence group.

Results: In 214 patients, 58 patients were recurrence group while 156 patients were non-recurrence group. Mean age at breast cancer diagnosis were 53 years. Recurrence group had high pathological staging, tumor grade, LVI, Ki-67 and lymph node involvement compared to non-recurrence group (p < 0.05). Mean cyclin B1 expression was 9.61% (19.62 % in recurrence group and 5.88 % in non-recurrence group; p< 0.001). We have used cut-off of cyclin B1 expression at ≥ 10 % (7th decile) to classify high and low of expression. Cyclin B1 high expression were demonstrated in 53.4% of recurrence group compared to 22.4% of non-recurrence group. In multivariate analysis, tumor grade (OR 8.42, 95%CI 1.04-67.98; p = 0.046), receiving neoadjuvant chemotherapy (NAC) (OR 4.27, 95%CI 1.41-12.87; p = 0.010) and % cyclin B1 expression (OR 1.04, 95%CI 1.00-1.07; p = 0.013) were associated with recurrent disease. Five-year relapse free survival for cyclin B1 low and high expression were 84.9% and 60.1%, respectively.

Conclusions: Tumor grade, receiving NAC and % cyclinB1 expression were associated with risk of recurrence in HR positive and HER2 negative early breast cancer.
The positive predictive value of immunohistochemistry of HER2 for positive in situ hybridization in breast cancer at Rajavithi Hospital and cardiac safety of trastuzumab

Pichyanin Amorntrakoon MD, Kultida Maneenil, Sunatee Sa-nguansai MD, Songwit Payapwattanawong MD, Jedzada Maneechavakajorn MD, Sudawat Laohavinij, Piyawan Tienchaiananda MD

Oncology Unit, Department of Medicine, Rajavithi Hospital, College of Medicine, Rangsit University, Bangkok, Thailand

**Background:** Several international guidelines defined HER-2 overexpression breast cancer as either immunohistochemistry (IHC) for HER2 scoring 3+ and/or positive in situ hybridization (ISH) of HER-2 gene. Thai regulation of reimbursement for trastuzumab, both IHC and ISH needed to be positive. This study was designed to report the positive predictive value of HER-2 IHC 3+/2+ for ISH positive in real life practice in Thailand.

**Methods:** Breast cancer patients who had ISH testing for HER-2 IHC 3+/2+ during January 2015 - December 2017 at Rajavithi hospital were retrospectively reviewed. The primary endpoint was positive predictive value of HER2 IHC 3+/2+ for positive ISH. Secondary endpoints were disease free survival of early stage HER2 positive breast cancer patients and cardiac safety of trastuzumab.

**Results:** Total 649 patients were newly diagnosed breast cancer at Rajavithi hospital during January 2015-December 2017. Among these patients, there were 102 patients (14.7%) who had both HER2 IHC and ISH testing. The positive predictive value of HER2 IHC 3+/2+ with positive ISH was 92% and 45% respectively. The 3 year-disease free survival for ISH positive breast cancer patients in stage I, II and III was 100%, 97.6% and 83.2%, respectively. Only one patient (1.5%) from 66 patients, who received trasutuzumab, had LVEF less than 50%. There was no symptomatic heart failure.

**Conclusions:** This study demonstrated the positive predictive value of IHC 3+ for ISH positive as high as 92% which relatively comparable with previous publications. The treatment outcome of early stage HER-2 positive breast cancer and cardiac toxicities from trastuzumab were comparable with landmark studies.

**Keywords:** Positive predictive value, Immunohistochemistry (IHC), In situ Hybridization (ISH), HER2 overexpression, breast cancer, trastuzumab