



บทคัดย่อ
การนำเสนอผลงานวิจัยกลุ่ม
Poster-Basic Science



Anti-insomnia and Anti-seizure Activities of the Novel Food Supplement Containing the Combined Extract of *Bombyx mori* and *Morus alba* Leaves

Pratthana Srichomphu^{1,3}, Wipawee Thukham-mee^{2,3}, Jintanaporn Wattanathorn^{2,3}, et al.

¹Department of Physiology and Graduate School (Neuroscience Program), Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

²Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

³Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand

Abstract

General description/Objectives: Currently, the therapeutic strategies against insomnia and epilepsy, the commonly found neuro-psychiatric disorders, are limited. Based on the reputation of *Bombyx mori* (*B.mori*) and *Morus alba* (*M.alba*) leaves and the synergistic effect advantage, the anti-insomnia and anti-seizure effects of the novel food supplement containing the combined extract of *B.mori* and *M.alba* was investigated in mice model.

Materials and methods: Male mice, weighing 20-30 g, were orally given the novel food supplement containing the com-

bined extract of *B.mori* and *M.alba* at doses of 30, 60 and 90 mg/kg BW once daily for 28 days. At the end of study, anti-insomnia was assessed via pentobarbital potentiation test while anti-seizure effect was assessed in PTZ-seizure model. In addition, the activity of GABA-T activity in cerebral cortex was also investigated.

Results: All doses of the novel food supplement containing the combined extract of *B. mori* and *M. alba* decreased sleep onset but only the high dose of the tested substance showed the increased sleep time latency. All doses of the novel supplement also decreased the seizure duration. How-

ever, the suppression of GABA-T activity was observed only in the medium and low doses treatment groups.

Conclusion: The novel food supplement containing the combined extract of *B. mori* and *M. alba* may provide beneficial effect as the potential food supplement to prevent insomnia and seizure. However, further investigations concerning the precise underlying mechanism and possible active ingredient are necessary.

Acknowledgement: This study was supported by Integrative Complementary Alternative Medicine Research and Development Center and Targeted Research, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.

Key word: *Bombyx mori*, *Morus alba*, anti-insomnia, anti-seizure

A Novel Polyherbal Chicken Soup Enhances Memory, Oxidative Stress and Cholinergic Function in Animal Model of Menopause

Warin Ohnon^{1,3}, Jintanaporn Wattanathorn^{2,3}, WipaweeThukhammee^{2,3} et al.

¹ Department of Physiology and Graduate School (Neuroscience Program), Faculty of Medicine, KhonKaen University, Thailand 40002

² Department of Physiology, Faculty of Medicine, KhonKaen University, Thailand 40002

³ Integrative Complementary Alternative Medicine Research and Development Center, KhonKaen University, KhonKaen, Thailand 40002

Abstract

General description/Objectives: The novel memory enhancer for menopause is required due to the limitation of the current therapy. Based on the crucial roles of oxidative stress and cholinergic function on memory and the synergistic effects polyherbal recipe, the effects of polyherbal chicken soup (WO1) on memory, cholinergic function and oxidative stress markers in ovariectomized (OVX) rat model were determined.

Materials and method: Female Wistar rats were divided in to 6 groups i) sham plus vehicle ii) OVX plus vehicle iii) OVX plus isoflavone iv)-vi) OVX plus WO1 at doses of 0.8, 1.6 and 2.4 mg.kg⁻¹ respectively. All

rats were treated for 35 days and memory assessment was performed every 7 days throughout the study period. Then, they were determined malondialdehyde (MDA) level together with the activities of superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPx) and acetylcholinesterase (AChE) in hippocampus.

Results: All doses of WO1 improved memory and decreased both AChE activity and MDA level in hippocampus. The enhanced SOD activity was observed in all WO1 treatment groups but the increased CAT and GPX activities were observed only in high dose treatment group.

Conclusion: "WO1", a polyherbal recipe, can enhance memory in experimental

menopause. Therefore, our findings suggest that “WO1” may provide the potential alternative therapeutic value for mitigating memory impairment in menopausal women. However, further researches concerning the active possible ingredients, safety and effective memory enhancing effect of “WO1” in clinical trial are still essential.

Acknowledgement: This study was supported by Integrative Complementary Alternative Medicine Research and Development Center and Targeted Research, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand.

Keywords: Polyherbal chicken soup; memory enhancing effect, oxidative stress, ovariectomized rat

Neuroprotective Effects of a Combined Extract of *Zingiber officinale* and Purple Rice on Cerebral Ischemia in Rat

Putthiwat Thongwong^{1,3}, Supaporn Muchimapura^{2,3}, Wipawee Tukhammee^{2,3}, Jintanaporn Wattanathorn^{2,3}, Panakaporn Wannanon^{2,3}, Terdtai Tong-un^{2,3}

¹ Department of Physiology and Graduate School (Neuroscience Program), Faculty of Medicine, Khon Kaen University, Thailand 40002

² Department of Physiology, Faculty of Medicine, Khon Kaen University, Thailand 40002

³ Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand 40002

Introduction and Objective: Recently oxidative stress and inflammation have been reported to play a crucial role on the pathophysiology of stroke. Due to the pathophysiology of stroke, inflammation has been reported to play a crucial role. Required further investigation, the limitation of the current therapy, the searching for food supplement targeting at stroke prevention from the medicinal plants possessing antioxidant and anti-inflammation has gained attention. Therefore, we aimed to develop the neuroprotectant and to determine the neuroprotective effect of the combined extract of *Zingiber officinal* and *Oryza sativa* (purple color) in MCAO rats.

Materials and Method: Various ratios of the water extract of *Z.officinale* and *O.sativa* were tested for antioxidant activity via DPPH and FRAP assays whereas anti-inflammation was tested via COX 2-inhibition assays. The ratio which provided optimum benefit was selected for further study. Various doses of the combined extract of *Z.officinale* and *O.sativa* were orally given to rats for 14 days then they were subjected to sham operation or to the occlusion of right middle cerebral artery. The animals were determined brain infarcted volume and oxidative stress in cortex and striatum.

Results: The combination extract of *Z.officinale* and *O.sativa* showed lower

IC₅₀ of COX 2 inhibitor, DPPH and FRAP than *Z. officinale* or *O.sativa*. The ratio of *Z. officinale* and *O.sativa* which provided optimum potential was 1: 1. High dose of the combined extract decreased brain ischemic volume in cerebral cortex whereas low dose induced ischemic volume in right MCAO rats. In addition, the decreased MDA level in cerebral cortex was observed in cerebral ischemic rats which obtained high dose treatment.

Conclusion: This study has demonstrated the neuroprotective potential of the combined extract of *Z.officinale* and *O.sativa*. However, the possible underlying mechanism still requires further study.

Acknowledgement: This study was supported by Invitation Research, Research Affair, Faculty of Medicine, Khon Kaen University and Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand.

Keywords: *Zingiber officinale*, *Oryza sativa*, cerebral ischemia, stroke

The Mitigation Effect of the Novel Food Supplement Containing the Combined Extract of Mulberry on Metabolic Syndrome and Brain Damage in Animal Model of Metabolic Syndrome Induced by High Fat Diet

Premrudee Hemha^{1,3}; Wipawee Thukhammee^{2,3}; Jintanaporn Wattanathorn^{2,3}

¹ Department of Physiology and Graduate School (Neuroscience Program), Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand 40002

² Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand 40002

³ Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand 40002

General description/Objectives: To date metabolic syndrome (MetS) is recognized as one of the challenges in this decade. MetS produced not only metabolic disturbance but also brain damage. Based on the crucial role of oxidative stress on the pathophysiology of both conditions, we aimed to determine the protective effect against MetS and brain damage induced by MetS of the combined extract of mulberry root and pineapple pulp (PH56).

Methods: We had developed the PH56 a novel product comprising of mulberry

roots and pulp of pineapple at the optimal ratio 4:1. Then, it was determined the protective effect against MetS and brain damage. Female Wistar rats, weighing 150-180 g, were induced MEtS by high fat diet. Then, they were orally given PH56 at doses of 8, 40 and 200 mg.kg⁻¹ BW at a period of 6 weeks. Body weight was determined every week. At the end of experiment, fat mass, fat size, plasma glucose and plasma insulin level were assessed. In addition, the oxidative stress markers including MDA level and the activities of SOD, CAT and GSH-Px in hippocampus.

Results: PH56 significantly decreased the weight of fat pad at retroperitoneal and urogenital areas and decreased adipocyte size at both areas mentioned earlier and subcutaneous and mesenteric areas. In addition it also decreased both plasma glucose and plasma insulin together with the decreased MDA level in hypothalamus. No changes in SOD, CAT and GSH-Px in hypothalamus were observed.

Conclusion: PH56 exerted the mitigation effect on MetS and brain damage by decreasing oxidative stress in hypothalamus which in turn decreased insulin resistance. It might also decrease adipocyte which in turn decreased insulin resistance induced by cytokine from adipocyte. Therefore, PH56 is the potential food supplement to combat brain damage and MetS.

Key words: *Morus alba*, *Ananas comosus*, metabolic syndrome, brain damage

Benefit of the Purple Corn Cob Extract Loaded Electrospun Nanofiber on Spinal Cord Injury

Rujikan Chaisanam¹; Supaporn Muchimapura^{2,3}; Wipawee Thukham-mee^{2,3};

Parichat On-ong-arj³; Waraporn Mahasap³; Jintanaporn Wattanathorn^{2,3}

¹ Department of Physiology and Graduate School (Neuroscience Program), Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

² Department of Physiology, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

³ Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand

Introduction and Objective: Accumulative lines of evidence have demonstrated that oxidative stress plays a crucial role on the pathophysiology of spinal cord injury. Since the current therapeutic strategy against spinal cord injury is surgery which requires high surgical skill and cost consuming, we aimed to determine the effect of purple corn cob extract loaded electrospun nanofiber on the functional recovery and oxidative stress status of spinal cord.

Materials and Methods: Male Wistar rats were divided into 6 groups; 1) Sham operation group 2) SCI or spinal cord injury group 3) SCI treated with Dexamethasone or spinal cord injury rats which received dexamethasone via oral route for 14 days.

4) SCI treated with zein nanofiber patch 5) SCI treated with 5%PPCE (purple corn cob extract nanofiber patch 6)SCI treated with 10%PPCE- nanofiber patch. All of the patches were changed once daily and the treatment was performed for 30 days. The functional recovery were assessed via Basso, Beattie, and Bresnahan (BBB) locomotor rating scale, walking track analysis, Von Frey filament and hot plate tests on the 3rd, 7th, 14th, 21st and 28th day after treatment. The rats were terminated at the end of study and biochemical assays for determining oxidative damage markers including malondialdehyde (MDA), protein carbonyl, superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase

(GSH-Px) were performed.

Results: Rats with spinal cord injury which received either 5% or 10% PPCE loaded- nanofiber improved BBB score, brain motor score and the responses of foot withdrawal reflex to both mechanical and thermal stimuli. The decreased MDA level in spinal cord was also observed.

Conclusion: The present study reveals that both 5% and 10% PPCE-loaded nanofiber patches are the potential biomaterial to enhance the recovery process after spinal

cord injury. The possible underlying may be partially via reduction of the oxidative damage. However, the precise underlying mechanism is required further study.

Acknowledgement: This study was supported by National Research Council of Thailand and the Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand.

Keywords: eletrospun nanofiber, spinal cord injury, purple corn cob

Anxiolytic and Anti-insomnia Effect of *Haliotis asinina* Linnaeus, *Zanthoxylum limonella* Alston and Combined Extract of Both Substances

Khanaphan Wongsathit^{1,3}, Wipawee Thukham-mee^{1,3}, Jintanaporn Wattanathorn^{2,3} et al.

¹Integrative Complementary Alternative Medicine Research and Development Center, KhonKaen University, KhonKaen, Thailand 40002, +66-43-348394

²Department of Physiology and Graduate School(Neuroscience Program), Faculty of Medicine, KhonKaen University, KhonKaen, Thailand 40002, +66-43-348394

³Department of Physiology, Faculty of Medicine, KhonKaen University, KhonKaen, Thailand 40002, +66-43-348394

Introduction and rationale: Anxiety and insomnia are the most commonly found psychological manifestation. The current pharmacological regimes usually produce side effects so the herbal medicine has gained much attention. To search for the potential herbs for treating these conditions, we aimed to determine the anti-anxiety and anti-insomnia effects of abalone (*Haliotis asinina* Linnaeus), makhwaen (*Zanthoxylum limonella* Alston) and combination extract of abalone and makhwaen.

Materials and method: Male mice were orally given the extract of *H.asinina* or *Z.limonella* or the combination extract of *H.asinina* and *Z.limonella* at doses of 4, 40 and 400 mg/kg BW once daily and then they were evaluated the anti-anxiety and anti-insomnia by using elevated plus maze test and pentobarbiturate potentiation test.

Results: The results showed that low dose of the combined extract of *H.asinina* or *Z.limonella* significantly number of open arm entries and total time spent in the open arm. In addition, it was found that the com-

combination extract of *H.asinina* or *Z.limonella* at dose of 40 mg/kg BW also enhanced sleep time.

Conclusion: This study clearly demonstrates the anti-anxiety and anti-insomnia effects of the combination extract of *H.asinina* or *Z.limonella*. However, the possible underlying mechanism and possible active ingredient are still unknown and required further investigations.

Acknowledgement: This study was supported by Invitation Research, Research Affair, Faculty of Medicine, Khon Kaen University and Integrative Complementary Alternative Medicine Research and Development Center, Khon Kaen University, Khon Kaen, Thailand.

Keywords: Abalone, *Haliotis asinina*, Makhwaen, *Zanthoxylum limonella*, sedative

A Study of the Effect of Carbamazepine in Trigeminal Neuralgia Patients Using Functional Magnetic Resonance Imaging (fMRI) of the Brain

Teekayu P. Jorns^{1,4,*}, Panatsada Awikunprasert^{2,4}, Warinthorn Phuttharak^{3,4}, Amnat Kitkhuandee^{3,4}, Orakarn Seubsamarn¹, Jaikaew Pratabsingha¹, Sumaitree Seesuan¹

¹ Faculty of Dentistry, Khon Kaen University, Thailand

² Faculty of Science, Khon Kaen University, Thailand

³ Faculty of Medicine, Khon Kaen University, Thailand

⁴ Neuroscience Research and Development Group, Khon Kaen University, Thailand

*Corresponding author E-mail: teepla@kku.ac.th

Abstract:

Even though novel antiepileptic drugs have been introduced over the years, carbamazepine is still being used as first line medication for the treatment of trigeminal neuralgia, however, the antineuralgic effect of this medication at the brain level is largely unknown. The aim of this study was to evaluate the effect of carbamazepine on trigeminal neuralgia patients' brains by analyzing the differences of blood oxygen level dependent (BOLD) of the brain before and after taking the medication and com-

paring both sides of brain (pain side and non-pain side) after taking the medication by using functional magnetic resonance imaging (fMRI) methods. Paired t-test and two-sample t-test were used for analyzing the fMRI data. Seven classical trigeminal neuralgia patients diagnosed according to the International Headache Society criteria were recruited into the study. The result of the fMRI study of the brain before taking the medication demonstrated that there were statistically significant differences (p -value < 0.005) at the area of anterior in-

sular cortex, somatosensory cortex, caudate nucleus and dorsolateral prefrontal cortex as there were found in the pain processing pathway of the brain. For the effects of carbamazepine on the brain's function, we found that before having carbamazepine there was statistically significant differences (p -value <0.05) in the brain's function at cerebellar cortex on the non pain side that coincide with previous studies that found cerebellar cortex is also responded

to various pain stimulation. After taking carbamazepine there were statistically significant differences (p -value <0.05) at the area of somatosensory cortex on both sides, insular cortex and dorsolateral prefrontal cortex on pain side. The increase in the brain function could be the effect of carbamazepine by inhibits the pain pathway resulting in pain relief.

Keywords: Trigeminal neuralgia, carbamazepine, functional MRI

Association between Ischemic Stroke and Periodontitis in Thai Adults

R. Noisombut¹, S. Tiamkao², P. Klanrit¹, T. DeRouen³, L. Leresche³, W. Pitiphat¹

¹ Faculty of Dentistry, Khon Kaen University, Khon Kaen, Thailand

² Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

³ School of Dentistry, University of Washington, USA

ABSTRACT

Objective: The association between periodontal inflammation and stroke is still controversial and limited to evidence from Western countries. The aim of this study was to investigate whether periodontitis was associated with ischemic stroke among Thai adults.

Methods: A 1:2 matched case-control study was conducted on 96 acute ischemic stroke cases. These cases were individuals aged 45 years or older who were first hospitalized at the stroke unit of Srinagarind Hospital, Khon Kaen. Medical specialists diagnosed stroke by using brain imaging from magnetic resonance imaging and/or computerized tomography. There were 2 groups of controls, the first group consisted of community-dwelling people and the

second group was hospital controls with nonvascular and noninflammatory neurological diseases with age- and sex-matched to cases. Before clinical examinations, each individual was interviewed using a standardized questionnaire to assess potential confounders. A calibrated dentist recorded clinical attachment level (CAL), using a periodontal probe right after stroke attack. All subjects were assessed for other systemic diseases, and other cardiovascular risk factors which were generally recorded in patients' medical records. Conditional logistic regression analysis was used to evaluate the association between periodontitis and ischemic stroke while controlling for possible confounders. Subgroup analyses according to age groups were also performed.

Results: Ischemic stroke was strongly associated with periodontitis (tertiary percentage of CAL ≥ 5 mm) mm with five times higher odds ratio for cerebral ischemia (OR, 5.88; 95% confidence interval, 2.33 to 14.83) after controlling for all possible confounders. The association also had a dose-response effect (P for trend < 0.001 by Chi-square Test). The association between periodon-

titis and stroke was higher among adults younger than age 60.

Conclusions: Our data suggested that periodontitis is associated with ischemic stroke, and its impact seems to be greater among younger Thai adults.

Translation and Validity and Reliability Testing of the E-San Short-form McGill Pain Questionnaire

Teekayu P. Jorns^{1,4}, Subin Puasiri², Siwimon Loppanthong³, Panchanit Pansaeng³

¹ Department of Oral Biology, Faculty of Dentistry, Khon Kaen University

² Department of Community Dentistry, Faculty of Dentistry, Khon Kaen University

³ Dental student, Faculty of Dentistry, Khon Kaen University

⁴ Neuroscience Research and Development Group, Khon Kaen University, Thailand

Abstract:

The aim of this study was to translate and examine the validity and reliability of the E-san version of the SF-MPQ. This study was a descriptive study involving blinded and independent back to back translation of the English version of the SF-MPQ by five expert individuals and subsequently tested for content validity. 186 patients were assessed by one interviewer and re-assessed again after 15 minutes with E-SFMPO. Pearson correlation coefficient of musculoskeletal group and odontogenic group were high (>0.7) but neuropathic group was quite moderate (0.68). For reliability test of the total, sensory, affective, and evaluate total pain intensity, high intraclass correla-

tions were demonstrated (>0.9 all group). Internal consistency was found to be high with Cronbach's alpha more than 0.8 for test and retest in musculoskeletal group and odontogenic group. Comparing the sensitivity between the 3 groups, we found that the sensitivity of neuropathic pain and musculoskeletal pain were moderate (0.65) but low sensitivity in odontogenic pain (0.2) were found. Specificity of neuropathic pain and odontogenic pain were high but low specificity in musculoskeletal pain. However, excluding the odontogenic pain group, the sensitivity of the neuropathic and musculoskeletal pain group was high at 0.8, and 0.9 respectively. This study suggests that E-SFMPO developed in our

study is reliable, valid and cross-culturally equivalent to the original SF-MPQ questionnaire and responsive for the assessment of pain in patients with neuropathic and musculoskeletal conditions.

Keyword: *Validity, Reliability, E-san Short-form McGill Pain Questionnaire*

Clinical Risk Factors Predictive of Thrombotic Stroke with Large Infarction

Worapot Rojsanga^{1,4}, Kittisak Sawanyawisuth^{2,4}, Veerajit Chotmongkol^{3,4}, Somsak Tiamkao^{3,4}, Kannikar Kongbonkiat³, Narongrit Kasemsap^{3,4}

¹Department of Medicine, Faculty of medicine, Khonkaen University

²Division of Ambulatory, Department of medicine, Faculty of Medicine, Khonkaen University,

³Division of Neurology, Department of medicine, Faculty of Medicine, Khonkaen University, Thailand

⁴North-eastern Stroke Research Group, Khon Kaen University

Background : Large infarction stroke played an important role in early mortality and severe disability. There were still scant information on risk factors in large infarction stroke.

Objectives : The primary outcome of the study was to identify the clinical risk factor predictive of thrombotic stroke with large infarction in Srinagarind hospital, Khonkaen, Thailand.

Patients and method : All adult (age ≥ 15 years old) patients with the diagnosis of thrombotic ischemic stroke who were treated at Srinagarind hospital, Khon Kaen University, Thailand during January 2012 - December 2013 were studied. The association of various stroke risk factors and large

infarction stroke were calculated using logistic regression analysis.

Results : Two - hundred and seventy six patients were included in the study . There were 59 patients (21.38 %) in large infarction group and 217 patients (78.62 %) in small infarction group. The mean age of the patients was 61.28 years old. 192 patients (69.57%) of the subjects were men. 171 patients (61.96 %) were collected from acute ischemic stroke group and 105 patients (38.04 %) were in late ischemic stroke group. The factors predictive of large infarction stroke was significant internal carotid stenosis.

Conclusions : Significant internal carotid stenosis could predict large in-

farction stroke, Then we suggested that carotid Doppler ultrasonography should be done in patients who presented with large infarction stroke to look for internal carotid stenosis because of cost effective and non invasive technique.

Keyword : predictive factor, thrombotic stroke, large infarction.