ISNPR

International Society for Nutritional Psychiatry Research

Inaugural Meeting in Tokyo

ABSTRACT

President Felice Jacka (Deakin University, Australia)
Date 21 June 2013
Venue National Institute of Health and Nutrition, Japan

Welcome Message from the President of ISNPR

Welcome to the inaugural meeting of the International Society for Nutritional Psychiatry Research (ISNPR).

It is a great pleasure to have the opportunity to join with colleagues working in this new and exciting field of research. Although there has long been interest in the links between nutritional deficiencies and psychiatric illness, as well as interest in the role of food allergies in such illnesses, the last five years has seen a significant and notable growth in this nascent field of research, with an accompanying impact on the viewpoints and practices of scientists and clinicians working in mental health.

In my particular field of interest – that of the role of overall dietary quality in the common mental disorders, depression and anxiety - there has been an exponential growth in the literature since the end of 2009. It is exciting and gratifying to see concordant results from across the globe, in young children and adolescents through to older adults, and from countries as diverse as Norway and Taiwan.

The study of the efficacy of nutritional interventions in psychiatric illness is also developing rapidly, with high quality randomised controlled trials now being conducted in multiple settings and with outcomes that include cognition as well as depression, bipolar disorder, schizophrenia and anxiety disorders. Another important development in this field is the rapidly growing recognition that nutrition is of central importance in the risk for cognitive decline and dementia. As this new recognition filters through to clinical researchers, I look forward to seeing new interventions in this area.

Another area of research with significant interest and activity grows from the understanding of the centrality of physical health to mental health and vice versa. There are many nutrition researchers, dietitians and other health practitioners working to address the physical health of patients with mental illness; acting on the recognition that physical and mental health are closely related and mutually reinforcing.

There is no doubt that the formation of an international society is timely; we now have the opportunity to join forces to share knowledge and build important collaborations. Building capacity in this field by sharing our knowledge with students and early career researchers will be another important activity of our society, as will building the credibility of nutritional psychiatry research through a clear understanding and implementation of best practice scientific methodology.

I welcome each of you to extend the invitation to join our new ISNPR to colleagues and students in your networks. I would also encourage you to contribute to the discussions and sharing of knowledge by contributing short pieces to our newsletter, which will be disseminated by the end of this year. For those who are unable to attend this year's meeting, we hope that 2014 may present a possibility for attendance.

Our aim is conduct our first Annual General Meeting before the end of July 2013 via teleconference and I welcome agenda items from those interested.

With very best wishes

Felice Jacka
President ISNPR (2013-14)

PROGRAM

Oral presentation

9:00-9:30 Reception

9.30-9.40 Welcome Address- A/P Jacka & Dr Mizoue

9.40-10.30 Keynote Lecture:
Can we prevent depression by modifying diet? – A/P Jacka (Australia)

10.30-10.45 COFFEE BREAK & Poster

10.45-12.15 Overview of Nutritional Psychiatry (Chair: Prof Su and Dr Matsuoka)

1. A historical perspective on nutritional psychiatry - Dr. Jonsson (Sweden)
2. Epidemiologic approach for nutritional psychiatry - Dr. Mizoue (Japan)
3. Omega-3 fatty acids in depression: The clinical, biological and therapeutic implications - Prof. Su (Taiwan)
4. Biology for the role of nutrients in psychiatric disorders - Dr. Maekawa (Japan)

Summary of poster presentation (1)

12.15-13.30 LUNCH & Poster

13.30-14.45 Observational Studies and Reviews (Chair: A/P Jacka and Dr Nishi N)

5. Healthy diet for the prevention of depression in a Japanese working population - Dr. Nanri (Japan)
6. The role of nutrition in late-life depression - Dr. Chiu (Taiwan)
7. Living circumstances and dietary patterns of Great East Japan Earthquake victims - Dr. Nishi N (Japan)
8. Fatty acid metabolism and the onset of psychosis - Prof. Amminger (Australia)

Summary of poster presentation (2)

14.45-15.00 COFFEE BREAK & Poster

15.00-16.50 Intervention Studies (Chair: Dr O'Neil and Dr Nishi D)

9. A double-blind, randomized, placebo controlled trial of the efficacy and safety of micronutrients for the treatment of ADHD in adults - Dr. Rucklidge (New Zealand)
10. Diet as a therapeutic target in depression: A randomised controlled trial - Dr. O'Neil (Australia)
11. Omega-3 fatty acids for attenuating posttraumatic stress symptoms among rescue workers after the Great East Japan Earthquake: A randomized controlled trial - Dr. Nishi D (Japan)
12. Omega-3 fatty acids versus placebo for secondary prevention of PTSD after accidental injury: A randomized controlled trial - Dr. Matsuoka (Japan)
13. Stress and earthquakes: a case control and RCT of micronutrients - Dr. Rucklidge (New Zealand)

Summary of poster presentation (3)

16.50-17.00 Summary and future directions- A/P Jacka (Australia)

17.00-17.05 Closing

17.30-19.30 Banquet

Poster presentation

1. Findings of fatty acid composition in the postmortem brains of patients with psychiatric disorders	- Dr. Hamazaki (Japan)
2. Artificially reared mice indicate the increase of anxiety levels	- Dr. Moriguchi (Japan)
3. Green tea and coffee consumption is inversely associated with depressive symptoms in a Japanese working population	- Dr. Pham (Japan)
4. High intakes of soft drinks and total sugar are associated with depressive symptoms in Japanese workers	- Dr. Pham (Japan)
5. Dietary pattern and insomnia symptoms in a Japanese working population	- Dr. Kurotani (Japan)
6. Association of leptin and ghrelin levels with depressive symptoms in a Japanese working population	- Dr. Akter (Japan)
7. Broad spectrum micronutrient formulas for the treatment of Psychiatric symptoms: A systematic review	- Dr. Rucklidge (New Zealand)
8. Association between suspected depression and suspected posttraumatic stress disorder (PTSD) and food intake frequency among resident victims after the Great East Japan Earthquake, March 11, 2011	- Dr. Matsubara (Japan)

ABSTRACT

Keynote Lecture

Can we prevent depression by modifying diet?

Felice N Jacka

Deakin University, Australia

The last century has seen major shifts in dietary intakes globally, with a marked increase in the consumption of sugars, snack foods, take-away foods and high-energy foods. At the same time, the consumption of nutrient-dense foods, such as high-nutrient vegetables and raw fruits, is diminishing. Chronic, lifestyle-driven diseases are now the largest contributor to early mortality across the globe. Although not classified as one of the noncommunicable diseases, depression also imposes a very large burden of illness in both developing and developed countries.

In early 2010 we published the first study to report a relationship between diet quality and clinical depressive and anxiety disorders. Since then, the evidence regarding the link between diet and mental health has developed and strengthened, with new studies published in a multitude of different countries and cultures, in adults, adolescents and children. Our newest research implicates both prenatal and childhood diet quality in the risk for common mental health problems in children. This presentation will review the new evidence for dietary behaviours as modifiable risk factors for the common mental disorders and address the potential for universal primary prevention strategies for depression and anxiety.

O-1

A historical perspective on nutritional psychiatry

Bo H Jonsson, MD, PhD

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Medical director, Center for Affective disorders, North Stockholm Psychiatry,
S:t Göran´s Hospital, Stockholm, Sweden

Food matters to health. This was described in China 5000 years ago, and in Greece more than 2000 years ago. Modern science studies nutrition in relation to health and disease. Since the end of the 19th century the vitamins were successively discovered, isolated, structurally elucidated, and synthesized. During the same time period genes were discovered. Archibald Garrod explained that all humans are chemically different and introduced *inborn errors of metabolism*. Conrad Waddington created the concept *epigenetic landscape* in 1942. Roger Williams introduced the term *biochemical individuality*. The ruling concept was for a long time *vitamins as prevention*, later it has been challenged by *vitamins as treatment*. In the middle of the 20th century psychiatry shifted its main interest from psychotherapy to patented medical drugs. These are sometimes called *xenobiotics* as they differ from the natural substances our bodies have been used to for thousands of generations. When pharmacologic drugs are not good enough, disease is often considered treatment-resistant or refractory. Then we need to think of other factors including nutrition. Imbalanced nutrition contributes to psychiatric disease, and needs correction for successful treatment. However, to use nutrition as a treatment we need to consider not only deficiencies, but also concurrent medication and genetic factors like polymorphisms. Many patients with treatment-resistant disease have nutrient deficiencies. Substitution with food and/or supplements has been beneficial in randomized controlled trials and other types of studies. The powerful effects of natural food and supplements for treatment and prevention are yet not well understood within psychiatry. Biochemical and clinical studies support an evolving practice of personalized nutrition. The presentation is a personal review.

O-2

Epidemiologic approach for nutritional psychiatry

Tetsuya Mizoue, MD, PhD

National Center for Global Health and Medicine, Japan

The association between nutrition and psychiatric disease can be assessed using standard methods of nutritional epidemiology. Due to unique features of psychiatric diseases, however, attention must be paid when designing a study, especially observational one, and interpreting data.

A questionnaire is commonly used in assessing diet in the past, which psychiatric disorder prevents patients from recalling accurately, leading to a spurious association. Retrospective studies are susceptible to this type of bias. Follow-up studies are considered preferable, but they are also subject to exposure miss-classification due to dietary change over time, leading to an underestimation of the association. Nutritional status can be measured objectively by using biological specimen; however, their results may be of limited use in dietary guidelines.

As regards outcome assessment, questionnaire-based diagnosis of psychiatry disorders differs considerably from clinically-diagnosed one, and it is important to select an appropriate diagnostic tool for each target population. There is a cultural difference in the response to the same mental health questionnaire, and this needs to be considered in deciding cut-off value.

Given the potential of nutrient-nutrient interactions, single nutrient approach may not appreciably modify disease risk and prognosis, and the analysis of dietary pattern would be an alternative. Researchers in the field of nutritional psychiatry are required to provide precise risk estimates associated with diet and nutrition though continuous improvement in methodology.

O-3

Omega-3 fatty acids in depression: The clinical, biological and therapeutic implications

Kuan-Pin Su, MD, PhD

Mind-Body Interface Laboratory (MBI-Lab), Institute of Neural and Cognitive Sciences,
Department of Psychiatry, China Medical University & Hospital, Taiwan

Clinical features, biological markers, and treatment outcomes for depression are extremely heterogeneous. The use of the current diagnostic schemas undoubtedly contributes to difficulties in finding any single biological or genetic marker for major depressive disorder (MDD) (1). For example, the unsatisfaction of monoamine-based antidepressant therapy and the high occurrence of somatic symptoms and physical illness in patients with MDD imply that the serotonin hypothesis is insufficient to approach the aetiology of depression (2).

Omega-3 polyunsaturated fatty acids (omega-3 PUFAs or n-3 PUFAs) are recently enlightening a promising path to discover the unsolved of depression. Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), 2 major bioactive components of omega-3 PUFAs, are both natural anti-inflammatory and anti-depressant agents. Patients with MDD show lower levels of omega-3 PUFAs in blood tissues (3). In addition, omega-3 PUFAs are reported to be effective in MDD treatment (4,5) and proven to be safe and effective in treatment for pregnant women with MDD (6). Furthermore, pre-clinical studies also support the beneficial effects of omega-3 PUFA in cellular (7) and animal models (8).

Increasing evidence suggests that inflammation responses play an important role in pathophysiology of several major psychiatric disorders, including MDD (9,10). Furthermore, the anti-inflammatory pathway has become a hot topic in looking for new antidepressant therapies (7,10). Anti-inflammatory omega-3 PUFAs prove beneficial in depression and several inflammation-related physical diseases, which imply a “mind-body interface” connection (2). Omega-3 PUFAs may particularly benefit children, pregnant women, and/or patients with comorbid cardiovascular or metabolic disorder, who face greater risks of adverse effects from antidepressants, antipsychotics, and mood stabilizers. Cost of omega-3 PUFAs is relatively modest
as compared to many psychiatric treatments and other over-the-counter natural products. Given the potential benefits and safety, omega-3 PUFAs deserve greater attention and wider application.

(1) Su KP. BioMedicine 2012; (2) Su KP. NeuroSignals 2009; (3) Lin PY, Huang SY & Su KP. Biol Psychiatry 2010; (4) Lin PY & Su KP. J Clin Psychiatry 2007; (5) Lin et al. Molecular Psychiatry 2012; (6) Su KP et al. J Clin Psychiatry 2008; (7) Lu DY et al. Neuropsychopharm 2010; (8) Huang SY et al. J Psychiatric Res 2008; (9) Su KP et al. Biol Psychiatry 2010; (10) Lu DY et al. Int J. Neuropsychopharm 2013.

O-4

Biology for the role of nutrients in psychiatric disorders

Motoko Maekawa M.D., Ph. D.

Laboratory for Molecular Psychiatry, RIKEN Brain Science Institute

Schizophrenia is a debilitating mental disorder that afflicts about 1% of the population worldwide. Despite intensive and multifaceted research, its exact etiology remains largely elusive. The neurodevelopmental hypothesis of schizophrenia suggests that the subtle disturbances occurred in early brain development increases the risk of later developing schizophrenia. Accordingly, various prenatal and perinatal risk factors have been linked to schizophrenia, including exposures related to infection, malnutrition and obstetric complications. Currently, researchers are revisiting the importance of relevant epidemiological data: “Dutch Hunger Winter in 1944 to 1945” and “A massive 1959-1961 famine in China”. These epidemiological data show that when pregnant mothers experienced malnutrition or famine, the risk of schizophrenia in their children increased by about two fold. Therefore, in this review, I discuss human and rodent studies of 1) inadequate nutrition [e.g. one carbon metabolism and polyunstaturated fatty acids (PUFA)] during neurodevelopmental period as a potential factor of mental disorders including schizophrenia, and 2) gene by environment (GxE) interactions.

O-5

Healthy diet for the prevention of depression in a Japanese working population

Akiko Nanri

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National Center for Global Health and Medicine

In Japan, deaths from suicide per year were recorded approximately 30,000 since 1998, with those aged 40 to 60 accounting for over half of the total. In addition, the prevalence of depression, which is one of risk factors of suicide, has been increasing. Suicide and depression is known to be associated with psychosocial factors, but epidemiological evidence of lifestyle factors such as dietary factors are limited. In the present study, we examined the association between dietary patterns or serum concentrations of folate, and vitamin D in a Japanese working population.

Participants were 547 subjects (323 men and 224 women aged 21-67 years) who participated in a health survey at the time of periodic checkup in 2006. Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression scale (CES-D). Dietary patterns were derived by using principal component analysis of the consumption of 52 food and beverage items, which was assessed by a validated brief diet history questionnaire.

We identified three dietary patterns: healthy Japanese, animal food, and westernized breakfast patterns. A healthy Japanese dietary pattern characterized by high intakes of vegetables, fruit, mushrooms, and soy products was associated with fewer depressive symptoms. Other dietary patterns were not appreciably associated with depressive symptoms. Serum folate concentrations were associated with a decreased prevalence of depressive symptoms in men but not in women. In the workplace surveyed in November, the prevalence of depressive symptoms tended to decreased with serum 25-hydroxyvitamin D, whereas there was no such association in the workplace surveyed in July. Our findings suggest that a healthy Japanese dietary pattern, higher serum folate, and higher serum vitamin D in sun-deprived season may be associated to decreased prevalence of depressive status.

O-6

The Role of Nutrition in Late-Life Depression

Chih-Chiang Chiu, M.D., Ph.D.

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Depression in late life severely affects the quality of life in older people and their careres. Older people with late-life depression have higher risk of cognitive impairment and dementia. Nutritional factors may have a potential role to decrease recurrence of depression and further cognitive impairment in this population; however, it has not been adequately studied. This brief review will focus on only a few nutritional factors, vitamin B12, folate, and omega-3 polyunsaturated fatty acids (PUFAs), which have been investigated more frequently in recent years.

In terms of omega-3 PUFAs, increased fish consumption has been found to be associated with lower likelihood of depression in older people. Plasma omega-3/omega-6 PUFA ratio has been reported to be lower in older people with depressive disorders. In addition, plasma EPA may be negatively associated with the severity of depressive symptoms in this group. In older people with late-life depression, erythrocyte total n-3 PUFA levels are positively associated with cognitive function, particularly immediate recall, in older people with previous depression.

Lower concentration of folate or vitamin B12 and higher homocysteine concentration have been reported to be associated with depression of older people in cross-sectional and prospective studies in spite of inconsistent results. The results of investigating their relationships with cognitive impairment seem to be less evident.

The possible role of these nutrition factors in people with late-life depression will be presented in this review. The possible clinical application and further study direction will be addressed.

O-7

Living circumstances and dietary patterns of Great East Japan Earthquake victims

Nobuo Nishi

National Institute of Health and Nutrition, Japan

Background: During the year after the Great East Japan Earthquake on March 11, 2011, health conditions and lifestyles of victims were widely surveyed. Psychological distress measured by the K6 was shown to be strongly associated with living circumstances of the victims. This study aimed to examine the relationship between their living circumstances and dietary patterns.

Methods: A total of 10,466 people aged 18 years or older, who comprised 25% of the area population of the same age-group, participated in the survey in Iwate Prefecture. The average number of times of daily consumption of eight food groups was determined by questionnaire. After excluding staple foods, which were consumed by 85% of subjects three times a day, factor analysis was performed on seven food groups among 9,789 people (3,795 men, 5,994 women).

Results: Factor analysis identified two dietary patterns—prudent and meat. The prudent dietary pattern—characterized by high intakes of fish and shellfish, soybean products, vegetables, fruit, and dairy products—was more evident in older subjects and women than in men. The meat dietary pattern—characterized by high intakes of meat and eggs—was more evident in younger subjects and men than in women. Age-adjusted multiple logistic regression analyses showed that for both men and women, current smokers and those living in difficult circumstances were likely to have a lower prudent dietary pattern score; among men, current smokers and daily alcohol drinkers were likely to have a higher meat dietary pattern score.

Conclusions: Among victims during the year after the earthquake, the prudent dietary pattern was associated with better living circumstances whereas the meat dietary pattern was not.

Key words: Great East Japan Earthquake, living circumstances, dietary patterns

O-8

Fatty acid metabolism and the onset of psychosis

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Potentially chronic diseases often have a critical point in their course beyond which treatment becomes less effective. In support of this, early treatment in schizophrenia and other psychoses has been linked to better outcome. Intervention prior to the first episode therefore holds the promise of even better outcomes, with the potential to prevent psychotic disorders. In the 1990s, criteria were developed and tested in a series of prospective naturalistic studies which identify a clinical population with subthreshold symptoms at ultra-high-risk for psychosis. The emergence of simultaneous brain volume changes in those ultra-high-risk individuals who develop psychosis indicate an active biological process, and underline the importance of pre-onset treatment. However, pre-psychotic intervention has also been questioned as, using current criteria, only 20-50% of individuals classified as prodromal develop a psychotic disorder within a 1-2 years period. Bioactive lipids are molecules that have both intra- and intercellular roles, including mediation, modulation and control of neurobiological processes, such as ion channel and receptor activity, neurotransmitter release, synaptic plasticity, second messenger pathways and neuronal gene expression. Long-chain omega-3 polyunsaturated fatty acids (PUFAs) have been shown effective for both, mood and psychotic symptoms, and they have neuroprotective properties. Because of the controversy concerned with the extent to which an intervention may produce harm which outweighs its benefits, omega-3 PUFAs are prime candidates for evaluation in putatively prodromal individuals. We conducted the first randomized, placebo-controlled trial on the preventive use of omega-3 fatty acids in 81 ultra-high-risk individuals[1]. A 12-week intervention with omega-3 PUFAs significantly reduced the transition rate to psychosis and led to significant symptomatic and functional improvements during the entire follow-up period (12 months). Extending this evidence, we address (1) putative mechanisms of omega-3 action; (2) biomarkers of progression to psychotic disorder; (3) biomarkers associated with response to treatment with omega-3s.

O-9

A double-blind, randomized, placebo controlled trial of efficacy and safety of micronutrients for the treatment of Attention-Deficit/Hyperactivity Disorder in adults

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[3]Canterbury District Health Board, Christchurch, New Zealand

Objectives: The role of nutrition in the treatment of Attention-Deficit/Hyperactivity Disorder (ADHD) is gaining international attention; however, treatments have generally focused only on diet restriction, diet manipulation or supplementing with one nutrient even though nutrients work synergistically. This study investigated the efficacy and safety of a micronutrient formula, consisting mainly of a broad-spectrum of minerals and vitamins, in the treatment of adults with ADHD.
Methods: Eighty (66.3% male) unmedicated adults with ADHD drawn from a sample of 136 community referrals in Christchurch, New Zealand diagnosed with standardized instruments, were randomly allocated to receive micronutrients (n=42) or placebo (n=38) for eight weeks; 74 completed. Primary outcomes were the Conners Adult ADHD Rating Scale (CAARS) self, observer and clinician scores; clinical global impression (CGI); and Montgomery-Asberg Depression Rating Scale (MADRS).
Results: Intent-to-treat analyses showed significant between-group differences favouring the micronutrient treatment (p<0.05) for CAARS DSM-IV Total Symptom subscales on self-ratings and observer ratings, but not clinician scores. However, clinicians' CGI ratings favoured active treatment over placebo: "Much" or "very much" improvement was seen in 48% (20/42) on micronutrients versus 21% (8/38) on placebo (OR=3.4; 95% CI 1.3-9.2). No group differences were observed on the MADRS, but baseline ratings were low; for those who entered the trial moderately to severely depressed, there was significantly greater change in active versus placebo. There were no differences between groups in adverse event rates. The active group had significantly higher prolactin levels, vitamin D, B_{12} and folate than placebo at endpoint.
Conclusions: This is the first objective evidence that micronutrient treatment is of benefit in adults with ADHD. This study provides evidence of efficacy that broad-spectrum vitamin and minerals, without omega fatty acids, treat ADHD symptoms in adults, including normalization of hyperactivity/impulsivity ratings.

None of the authors have any financial disclosures or competing interests to declare.

3 key words: micronutrients, nutrition, RCT
Trial registration: www.anzctr.org.au:ACTRN12609000308291

O-10

Diet as a therapeutic target in depression: A randomised controlled trial

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BACKGROUND AND AIMS: Recent epidemiological evidence has revealed the important contribution of diet quality to the development and onset of mental disorders, namely major depressive disorder (MDD). These data provide support for diet, a largely modifiable risk factor, to be used as a therapeutic target for individuals with depression. However, to date, this approach to treatment remains largely under-researched. We aim to conduct the first randomised controlled trial to investigate the efficacy of dietary improvement in the treatment of MDD.

METHODS: At least 176 individuals with current MDD are being recruited from the community in two metropolitan regions of Victoria (Geelong and Melbourne). Participants are those who fulfill the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) diagnostic criteria for MDD (Single Episode/Recurrent), score ≥18 on the Montgomery-Åsberg Depression Rating Scale (MADRS) and are assessed as having poor quality diet. Participants are randomised to a 12-week adjunctive dietary intervention with an accredited practicing dietitian or a control condition. The primary outcome will be change in MADRS depression scores, pre- and post-intervention. A formal economic evaluation will be undertaken.

RESULTS: The presentation will describe study methods and intervention, baseline recruitment and related findings.

CONCLUSIONS: This trial will provide key data regarding the impact of a dietary-based intervention for the management of depression. If efficacious and cost-effective, this program has the potential for wide-scale implementation in a range of health care settings and will be suitable for patients who are non-responsive to pharmacological and/or psychological treatments or prefer alternative approaches to management.

O-11

Omega-3 fatty acids for attenuating posttraumatic stress symptoms among rescue workers after the Great East Japan Earthquake: A randomized controlled trial

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Department of Psychiatry, National Disaster Medical Center; Tokyo JAPAN

Background:
The Great East Japan Earthquake left about 20,000 dead or missing. Previous studies showed rescue workers are at high risk for posttraumatic stress disorder (PTSD). This study aimed to determine whether omega-3 fatty acidsl supplementation could attenuate PTSD symptoms among rescue workers following the Great East Japan earthquake.

Methods:
In this, randomized trial, rescue workers who provided consent to participate were randomly allocated to a omega-3 fatty acids plus psychoeducation group or a psychoeducation alone group. The primary outcome was PTSD symptoms assessed by the Impact of Event Scale-Revised (IES-R) at 12 weeks after omega-3 fatty acids supplements were shipped to the participants. All analyses were by intention to treat.

Results:
Of the 172 participants enrolled between April 2 and 12, 2011, 86 were assigned to each of the two groups. Only 1 participant in the psychoeducation alone group was lost to follow-up. When adjusted for age, sex, and IES-R score at baseline, no significant difference in primary outcome was seen between the two groups (-0.9, 95% CI, -3.0 to 1.2; P=.39). Remarkably, change in the IES-R score of women in the two groups from baseline to 12weeks was -3.9 (95% CI, -7.5 to -0.3; P=.04) when adjusted for age and IES-R scores at baseline.

Conclusions:
This trial did not show the effectiveness of omega-3 fatty acids supplementation for the prevention of posttraumatic stress symptoms in rescue workers. However, supplementation reduced PTSD symptoms significantly in women. Omega-3 fatty acids may offer a safe strategy for preventing PTSD in women.

Reference: Nishi D, et al. Psychotherapy and Psychosomatics 81(5):315-317, 2012

O-12

Omega-3 fatty acids versus placebo for secondary prevention of PTSD after accidental injury: A randomized controlled trial

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To date, we have shown in an open trial that posttraumatic stress disorder (PTSD) symptoms in critically injured patients can be reduced by taking omega-3 fatty acids [1,2], hypothesized to stimulate hippocampal neurogenesis[3]. The aim of the present randomized controlled trial is to examine the efficacy of omega–3 fatty acids in the secondary prevention of PTSD following accidental injury, as compared with placebo.

This presentation outlines the study protocol[4] and a tentative result. We have planned to recruit accident-injured patients and follow them prospectively for 12weeks. Enrolled patients have been randomized to either the omega-3 fatty acids group (1,470mg docosahexaenoic acid and 147mg eicosapentaenoic acid daily) or placebo group.

Primary outcome is score on the Clinician-Administered PTSD Scale (CAPS). We need to randomize 140 injured patients to have 90% power to detect a 10-point difference in mean CAPS scores with omega-3 fatty acids compared with placebo. The trial was initiated on December 13 2008, with 106 subjects randomized by February 28 2013.

This study promises to be the first trial to provide a novel prevention strategy for PTSD among traumatized people.

1. Matsuoka Y, Nishi D, et al. *Psychother Psychosom.* Jun 30 2011;80(5):310-312.
2. Matsuoka Y, Nishi D, et al. *J Clin Psychopharmacol.* 2010 30(2):217-219.
3. Matsuoka Y. *Biopsychosoc Med.* 2011;5:3.
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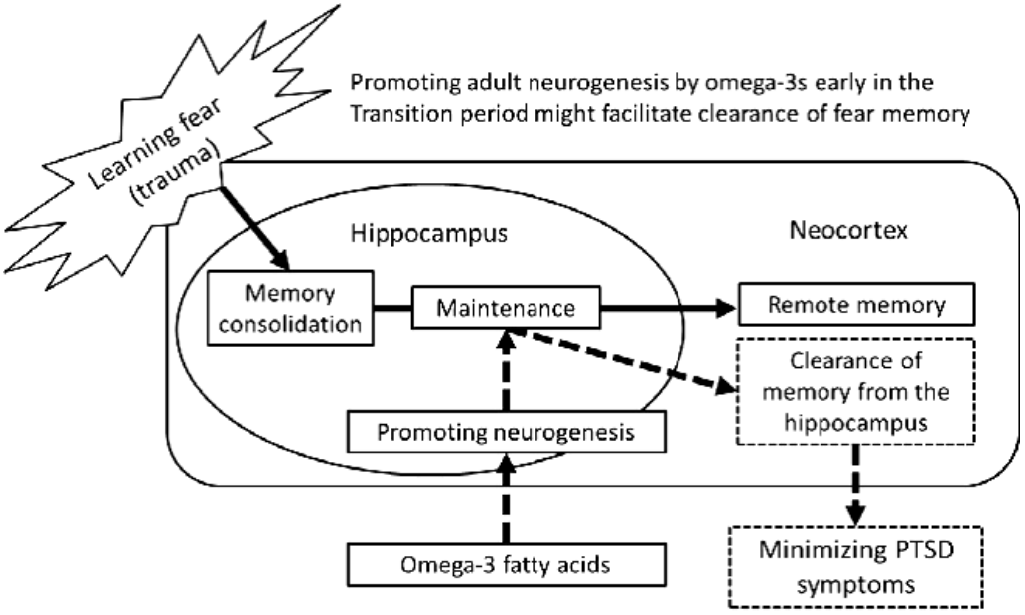

O-13

Stress and earthquake: a case-control and RCT of micronutrients

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[2]Otago University, Christchurch, New Zealand

***Background*:** The role of nutrient supplementation for emotional resilience in the face of stress is a topic of interest, but difficult to study. A 7.1 earthquake took place in the midst of a research trial on a micronutrient treatment for Attention-Deficit/Hyperactivity Disorder (ADHD). This unpredictable, highly stressful event provided a unique opportunity to examine whether individuals with ADHD taking micronutrients demonstrated a greater level of emotional resilience post-earthquake than individuals with ADHD not taking micronutrients.

Methods: Thirty-three adults with ADHD were assessed at two time periods following the earthquake using a measure of depression, anxiety and stress, the Depression Anxiety Stress Scale (DASS). The DASS had also been completed at some point pre-earthquake, which served as the baseline measure. At the time of the earthquake, 16 participants were taking micronutrients (micronutrient group), and 17 were not (control group). The differences between-group were compared.

***Results*:** While there were no between-group differences at one week post-quake, signifying the increased levels of stress and anxiety experienced by both groups, at two weeks post-quake, the micronutrient group reported significantly less anxiety and stress than the controls (effect size 0.69). These between-group differences could not be explained by other variables such as pre-earthquake measures of emotions, demographics, psychiatric status, and personal loss or damage following the earthquake.

***Conclusions*:** The results suggest that taking micronutrients may increase emotional resilience, demonstrated by a reduction in stress and anxiety following a highly upsetting, unpredictable event such as an earthquake. These results are consistent with controlled studies showing the benefit of micronutrient supplementation for mental health.

P-1

Findings of fatty acid composition in the postmortem brains of patients with psychiatric disorders

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According to the epidemiological studies of patients with major depressive disorder (MDD), bipolar disorder or schizophrenia, the level of n-3 polyunsaturated fatty acid (PUFA) was significantly low in peripheral tissues such as red blood cell (RBC), serum, plasma, or adipose tissue [1]. We have previously investigated serum fatty acids, and mood in healthy volunteers, and found that n-3 PUFAs were inversely associated with depression after adjustment for confounding factors [2, 3]. As for suicide, we have also conducted a case-control study with suicide attempters and have found an inverse correlation between risk of suicide attempt and RBC n-3 PUFAs [4]. A recent meta-analysis of n-3 PUFAs in the treatment of bipolar disorder showed that bipolar depressive symptoms may be improved by adjunctive use of n-3 PUFAs; however, manic symptoms were not attenuated [5]. A more recent meta-analysis of n-3 PUFAs in the treatment of DSM-defined MDD showed that n-3 PUFAs, especially EPA, had a significant antidepressant effect on patients with MDD [6]. All these findings above raise the question whether alteration of the level of PUFAs is a universal phenomenon throughout the brain of patients with psychiatric disorder. McNamara et al. examined the postmortem orbitofrontal cortex from patients with schizophrenia [7], MDD [8] and bipolar disorder [9], and found that DHA was specifically lower than controls by 20%, 22% and 24%, respectively. We investigated PUFA levels in the postmortem hippocampus [10], amygdala [11] and entorhinal cortex [in submission] from subjects with psychiatric disorders. Not much change was found in n-3 PUFAs; however, some small changes were seen in n-6 PUFAs in the hippocampus and amygdala. In the entorhinal cortex, a significant decrease of docosapetaenoic acid (n-3), which is an intermediary metabolite of DHA, was found in patients with MDD. Changes in n-3 PUFAs associated with psychiatric disorder may be specific to certain brain regions.

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P-2

Artificially reared mice indicate the increase of anxiety levels

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In rodents, it has been reported that early weaning within 2 weeks of age cause a harmful influence on emotional behavior, such as anxiety and aggression, after maturation. Therefore, we evaluated the anxiety level in mice of early postnatal maternal separation. Newborn mice were separated from dams within 48 hours after birth, and were fed artificial milk. Artificially reared mice were subjected to the elevated plus maze test to assess their emotional behavior, when they were 9 weeks of age. Artificially reared mice showed significantly lower frequency of entries and dipping into the open arms of maze compared with Dams' reared mice. This result means that the anxiety level of artificially reared mice was higher than that of Dams'. Moreover, the concentration of monoamines in brain was determined after behavioral experiment. The hippocampal serotonin (5HT), 5-hydroxyindoleacetic acid (5HIAA) and Norepinephrine (NE) in the artificial rearing groups were significantly higher than those of Dams' group. These results suggest that the interaction with mother during lactation period is extremely important for the social-emotional development of newborn infants.

P-3

Green tea and coffee consumption is inversely associated with depressive symptoms in a Japanese working population

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Background: The role of green tea and coffee consumption in depression is poorly understood and less studied. The aim of this study was to examine the association between the consumption of green tea, coffee and caffeine and depressive symptoms.

Methods: Data were 537 men and women aged 20-68 years obtained from two cross-sectional surveys in northeastern Kyushu, Japan in 2009. Consumption of green tea and coffee was ascertained with a validated dietary questionnaire, and the amount of caffeine intake was estimated from these beverages. Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D), with a CES-D score of ≥16 being defined as case status. Multiple logistic regression analysis was performed to compute odds ratio (OR) and 95% confidence interval (CI) for depressive symptoms with adjustments for potential confounders.

Results: Higher green tea consumption was associated with a lower prevalence of depressive symptoms. Compared with participants consuming ≤1 cup/d, those consuming ≥4 cups/d of green tea had a 51% significantly lower prevalence odds of having depressive symptoms after adjustment for potential confounders, with significant trend association (*P* for trend = 0.01) . Further adjustment for serum folate slightly attenuated the association. Coffee consumption was also inversely associated with depressive symptoms (OR for ≥2 cups/d versus <1 cup/d = 0.61; 95% CI 0.38, 0.98). Multiple-adjusted OR for depressive symptoms comparing highest with lowest quartile of caffeine consumption was 0.57 (95% CI 0.30, 1.05; *P* for trend = 0.02).

Conclusion: Results suggest that higher consumption of green tea, coffee and caffeine may afford protection against depression.

P-4

High intakes of soft drinks and total sugar are associated with depressive symptoms in Japanese workers

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Background: Few studies have investigated the association between soft drink intake and depression, and none has addressed this issue among Asians. Moreover, little is known about the role of dietary sugar intake in depression. The present study examined the association of intakes of soft drinks and total sugar with depressive symptoms among Japanese.

Methods: Participants were 1686 men and women aged 19-68 years accumulated from three cross-sectional surveys in northeastern Kyushu and Kanto region of Japan in 2009 and 2012. The intake of soft drink and habitual sugar was ascertained with a validated dietary questionnaire. Depressive symptoms were measured using the Center for Epidemiologic Studies Depression Scale (CES-D), and presence of depressive symptoms were defined using three cutoffs: ≥16 (standard cutoff), ≥19 (Japanese criteria) and ≥23 (overall criteria for severe form). Random-coefficient logistic regression analysis was performed to estimate odds ratio (OR) and 95% confidence interval (CI) for depressive symptoms with adjustments for potential confounders.

Results: There was no significant association of soft drink intake with either mild or moderate depressive symptoms (CES-D score ≥16) or severe depressive symptoms (CES-D score ≥23). However, a significant positive association was observed when Japanese criteria were used (CES-D score ≥19); compared with participants without soft drink intake, those consuming ≥4 cups of soft drink per week had a 55% significantly higher prevalence odds of depressive symptoms (95% CI, 1.01-2.3; *P* for trend = 0.04). Habitual sugar intake was significantly inversely associated with depressive symptoms (CES-D score ≥16); the prevalence odds of depressive symptoms in the highest quartile intake of sugar was a 49% significantly greater than that in the lowest category (95% CI, 1.03-2.15; *P* for trend = 0.002). In addition, there was a significant trend of positive association of sugar intake with depressive symptoms using higher cut-off points (CES-D score ≥19 or ≥23).

Conclusion: Results suggest that higher intake of soft drink and dietary sugar may predispose to depression.

P-5

Dietary pattern and insomnia symptoms in a Japanese working population

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Background: Diet is a behavioral factor that may influence sleep, but epidemiological evidence on this issue is sparse. We investigated the relationship between dietary pattern and insomnia in a Japanese working population.

Methods: Participants were 1140 workers, aged 18-70 years, who participated in a health survey at the time of periodic checkup in 2012. Dietary intake was assessed with a self-administered diet history questionnaire. Dietary patterns were extracted by principal component analysis on the basis of energy-adjusted intake of 52 food items. Presence of insomnia symptoms, including difficulty initiating sleep (DIS), difficulty maintaining sleep (DMS), and poor quality of sleep (PQS) were self-reported. Odds ratios of each insomnia symptoms according to tertile categories of each dietary pattern were estimated using logistic regression with adjustment for potential confounding variables.

Results: We identified three dietary patterns; a healthy dietary pattern, a traditional Japanese dietary pattern, and a Westernized breakfast pattern. The healthy dietary pattern score, characterized by high intake of vegetable, potatoes, seaweeds, mayonnaise/dressing, and egg and low intake of rice, was associated with a decreased prevalence of DIS (P for trend = 0.048). In addition, the traditional Japanese dietary pattern score, characterized by high intake of fish and shellfish, soy products, and pickled vegetable and low intake of bread, was associated with a decreased prevalence of PQS (P for trend = 0.003). Dietary pattern was not associated with DMS.

Conclusion: Diet rich in vegetables, fish and shellfish, seaweed, soy products, and egg may be associated with fewer insomnia symptoms.

P-6

Association of leptin and ghrelin levels with depressive symptoms in a Japanese working population

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Background: Leptin and ghrelin have been implicated to have a role in the pathogenesis of major depression. However, the evidence is lacking among apparently healthy people with depressive symptoms. This study examined the association of these appetite hormones with depressive symptoms in a Japanese working population.
Methods: A cross-sectional study was conducted among 497 municipal employees (287 men and 210 women) aged 20-68 years. Fasting serum leptin and ghrelin levels were measured. Depressive symptoms were assessed using the Center for Epidemiologic Studies Depression (CES-D) scale.
Results: In women, higher leptin levels were associated with decreased prevalence of depressive symptoms, albeit statistically not significant (P_{trend} = 0.14). The multivariable adjusted odds ratios (95 % confidence interval) of depressive symptoms for the lowest through highest tertiles of leptin levels were 1.00 (reference), 0.41(0.17-0.97), and 0.47 (0.18-1.23), respectively. In men, leptin levels were not associated depressive symptoms. No significant association was observed between ghrelin levels and prevalence of depressive symptoms either in men or women.
Conclusion: The results of this study suggest that lower leptin levels may be related to higher prevalence of depressive symptoms among Japanese women.

P-7

Broad spectrum micronutrient formulas for the treatment of psychiatric symptoms: A systematic review

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Objectives. 20th century reports of psychiatric symptoms treated with micronutrients (vitamins, minerals) almost always studied one nutrient at a time. Only recently have studies emerged that evaluate combination formulas, even though ingesting micronutrients in combination makes greater physiological sense, as many must be taken together to maximize absorption and function. We conducted a systematic review of the mental health effects of taking nutrient formulas consisting of at least four vitamins and/or minerals.
Methods. MEDLINE, PubMed, PsycINFO, and PsycARTICLES databases, the Cochrane Library and Google Scholar were searched using mood, depression, bipolar, stress, anxiety, antisocial, ADHD, autism, PDD, Asperger's, schizophrenia, psychosis, alcohol, substance use, smoking, cannabis, bulimia, eating disorder, and anorexia in combination with vitamin or mineral or micronutrient or nutrients or nutrient supplement. Four methodologies were included: randomized controlled trials (RCTs), open-label trials (OL), case-control studies, and case studies with within-subject crossovers (ABAB). .
Results. Of 958 abstracts retrieved, 47 met inclusion criteria: 25 double blind RCTs, 1 single blind RCT, 1 unblinded RCT comparing different formulas, 2 comparisons of treatment as usual with micronutrients, 2 case-control studies, 1 nonrandomized comparison of two formulas, 10 OLs, and 5 case studies with reversals. The data are generally consistent: nutrients in combination can exert a significant benefit for psychiatric symptoms. Ingredients common to all formulas were the B vitamins, not surprising given the physiological roles that they play, ranging from adrenal support to neurotransmitter synthesis. Overall, the clinical significance of the results may prove substantial; many of the studies documented examples of complete normalization of behaviour with micronutrients alone.
Conclusions. There is evidence for the efficacy of combined micronutrients in the treatment of stress and antisocial behaviours as well as depressed mood in nonclinical and elderly populations. The evidence is sufficiently consistent to influence clinical practice and to stimulate further research.

None of the authors have any financial disclosures or competing interests to declare.

3 key words: micronutrients, nutrition, systematic review

P-8

Association between suspected depression and suspected posttraumatic stress disorder (PTSD) and food intake frequency among resident victims after the Great East Japan Earthquake, March 11, 2011

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Introduction: A tsunami caused by the Great East Japan Earthquake devastated coastal areas of Higashi-Matsushima city, Miyagi prefecture on March 11, 2011. About half of the victims in inundated areas continued to reside in their damaged houses and often lived on the upper floors where the ground floor was devastated by the tsunami. The association between suspected depression and suspected posttraumatic stress disorder (PTSD) and food intake frequency among resident victims was explored.

Method: A cross-sectional household screening was conducted for the resident victims from two to four months after the tsunami. The screening was performed at the local administrative areas which had been totally or partially flooded by the tsunami. The screening questionnaire included demographics, mental status, such as depression and PTSD, house flooding, smoking habit, food intake frequency (vegetable, fruits, fish, meat, egg, milk and dairy foods) during the last two weeks.

Results and discussion: Among 5,455 respondents, 10.0% were suspected of having depression and 5.7% were suspected of having PTSD. Logistic regression analysis showed that no or infrequent intake (‘once a week’ to ‘several times a week’) of any categories of food group was significantly associated with suspected depression, and no or infrequent intake of fish, meat, egg, and milk and/or dairy products was significantly associated with suspected PTSD. The results of this study suggest the need for restoring supply of foods enabling balanced diet, especially protein sources in order to prevent depression and/or PTSD among disaster victims.

OVERALL DIET AND RISK OF DEPRESSION

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The impact of specific nutrients in the physiopathological pathways leading to depression [1] combined with the fact that diet is modifiable has emphasized the importance of research on the possible role of dietary factors into depression and depressive symptoms.. Although a potential beneficial effect of some nutrients on a depression process may exist, focusing on individual nutrients or food may provide an incomplete picture of the relationship between diet and depressive symptomatology at least because the effect of single nutrient may be too small to be detected but also because meals consist of complex combinations of nutrients which interact with each other. The development of nutritional epidemiology methods [2] to assess overall diet were recently applied to depression. Our team previously showed an association between overall diet measured by dietary patterns and subsequent depressive symptoms [3] independently of other health behaviors. Since then, several other studies comfort this finding in adolescents [4, 5] and in adults [6-10]. The aim of this lecture is to present this literature and to discuss the impact of these studies in light of the potential causal inference of diet on depressive symptoms.

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Depressive symptoms Overall Diet Observational studies Nutritional epidemiology

List of Speakers

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CHIU	Chih-Chiang	(Taiwan)
HAMAZAKI	Kei	(Japan)
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