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Cerebral venules are major factors in formation of brain microinfarcts at systemic inflammation: Implications for dementia

Gunel Ayyubova, Nigar Guliyeva, Shahla Huseynova, Leyla Yildirim, Shahana Gurbanova and **Ilaha Sadigi**
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Statement of the Problem: Despite the widely accepted facts regarding the role of neuroinflammation as well as vascular pathology in the pathogenesis and progression of neurodegenerative diseases no special significance was given to the pathology of different cerebral microvessels. The purpose of this study is to describe the structural alterations in neuro-glio-vascular elements of brain cortex at early stages of acute inflammation.

Methodology: Systemic inflammation was induced by intravenous injection of purified lypopolysacharide (LPS) from E. coli [Serotip 0111:B4] at a dose of 1,0 mg/kg dissolved in saline. Semi thin and ultrathin tissue sections were examined by means of light and electron microscopy.

Findings: Investigation of brain capillaries revealed insignificant changes in the integrity of their wall. Despite of edematous perivascular Astrocytic EndFeet (AEF) the architecture of surrounding brain parenchyma was structurally intact. However, the destructive changes in the wall of cortical venules and their obturation with blood cells were found as indicatives of early onset of neuroinflammation. Pathological changes were especially intense in the postcapillary venules draining blood from brain capillary bed and permeability of which is greater than that of other vessels. In fact, the disruption of intercellular tight junctions, significant increase in the amount of pinocytotic vesicles in endotheliocytes, the appearance of transendothelial channels and thickening of perivascular basal membranes were indicators of blood-brain barrier disruption in those vessels. The discontinuous adluminal plasma membrane of endothelial cells and amorphous material in the lumen of venules were observed. Though AEF around venules were not swollen the integrity of their membranes was disturbed. Moreover, electron microscopy revealed the apparent indicators of parenchymal damage around venules: degenerative changes in nerve and glial cells, signs of vasogenic edema among neuropil elements etc.

Conclusion: the pathology of cerebral venules should be considered as primary causes for brain microinfarcts with subsequent neurodegeneration at inflammatory conditions.

Biography

Gunel Ayyubova is a senior lecturer, PhD holder at the department of Histology, Embryology and Cytology of Azerbaijan Medical University. Her research area as the Neuroscience and topic of research is the Immunofluorescence and Electron microscopy of brain tissue at inflammatory conditions and neurodegeneration.

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Validation of a short telephone test (COGTEL) for the diagnosis of symptomatic Alzheimer's disease (AD)

Maria Skondra

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The identification of cognitive impairment in general practice requires short but accurate tests. For epidemiologic surveys and genetic family studies cognitive tests are desirable which can be administered over the telephone. We assessed the ability of the Greek version of the Cognitive Telephone Screening Instrument (COGTEL) to identify patients with symptomatic Alzheimer's disease (AD) and compared it with the diagnostic accuracy of the conventional modified Mini Mental State Examination (3MS). The study refers to 15 patients of the outpatient clinic for cognitive disorders of the University Hospital of Patras who suffered from symptomatic Alzheimer's disease (ten with mild dementia and five with mild cognitive impairment). The study also included 17 cognitively unimpaired age-matched individuals. The COGTEL and 3MS were validated against an expert diagnosis based on a comprehensive diagnostic workup which included the Montreal Cognitive Assessment (MoCA). Statistical analysis was performed using the Receiver-Operator-Characteristics (ROC) method. The COGTEL outperformed the 3MS in the distinction between symptomatic AD and cognitively unimpaired individuals (Area under the curve, AUC: 0.92 vs. 0.89, respectively). The COGTEL is a short and practical but accurate telephone test for the identification of symptomatic AD for use in epidemiological surveys and genetic family studies. The interview achieves higher diagnostic precision than the 3MS and contributes to a valid assessment of cognitive performance.

Biography

Maria Skondra is a PhD candidate of the Medical Faculty of Medicine (University of Patras) and graduate of the Department of Nursing (Western Greece University of Applied Sciences). Her scientific activity is focused on early diagnosis of cognitive impairment in neurodegenerative neurocognitive disorders. She is a graduate of the Hellenic Red Cross Nursing School as well as of the Department of Sociology (Panteion University of Athens). She completed postgraduate studies at the Department of Social and Educational Policy of the University of Peloponnese with specialization in the field of "Health Institutions and Policies". She has been working as a nurse in the Greek Red Cross since 2001 and as scientific scholar of the Department of Nursing (Western Greece University of Applied Sciences) since 2016.

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The relationship between weight loss and texture-modified diets in patients with Alzheimer's disease in Japan

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Objectives: To determine the prevalence of weight loss in patients with Alzheimer's disease (AD) with normal or Texture-Modified Diets (TMD), and to assess the energy and protein intake required to prevent weight loss.

Methods: We included 75 Japanese long-term care hospital patients with probable AD in an interventional study. Patients with weight loss ≥7.5% over 3 months were at high risk of malnutrition.

Results: Thirty seven (49.3%) patients were already malnourished (BMI <18.5 kg/m2) and 16 (21.3%) had ≥7.5% weight loss, with an energy intake at cutoff of 29.088 kcal/kg and a protein intake at cutoff of 1.129 g/kg. The food consumption rate showed a significant increasing trend with greater texture modification (Ptrend = .038). Odds ratios of weight loss were lower for TMD than for normal food.

Conclusion: A mismatch in food type may cause weight loss. Multicentered research using larger sample sizes is necessary to investigate causality.

	Total	Food type					P-value
		Normal	Soft foods	Porridge and side dishes	Liquidized food	Jellied food	
	(n = 75)	(n = 7)	(n = 14)	(n = 30)	(n = 21)	(n = 3)	
Age (years)	83.7 ± 7.2	79.7 ± 8.2	85.8 ± 6.2	83.0 ± 6.2	85.0 ± 8.2	80.7 ± 13.7	.308
Sex, n (%)							.787
Male	22 (29.3)	1 (14.3)	5 (35.7)	10 (33.3)	5 (23.8)	1 (33.3)	
Female	53 (70.7)	6 (85.7)	9 (64.3)	20 (66.7)	16 (76.2)	2 (66.7)	
Length of disease duration, (years)	5.7 ± 3.6	5.4 ± 4.2	4.9 ± 4.1	5.8 ± 3.8	6.0 ± 2.8	7.4 ± 3.2	.178
Length of stay, (months)	1.8 ± 1.6	1.2 ± 3.1	1.5 ± 1.7	1.7 ± 1.4	1.9 ± 1.5	3.7 ± 1.7	.170
Height, (cm)	149 ± 10	151 ± 11	151 ± 9	149 ± 10	149 ± 10	157 ± 7	.547
Weight,(kg)	42.6 ± 9.3	52.0 ± 11.7	47.3 ± 7.2	43.0 ± 8.2	37.1 ± 7.5	32.3 ± 4.0	<.001[a]
BMI (kg/m2)	19.0 ± 3.5	22.8 ± 4.0	20.8 ± 2.3	19.4 ± 3.1	17.1 ± 2.8	14.1 ± 2.5	<.001[a]
<18.5	37 (49.3)	1 (14.3)	2 (14.3)	15 (50.0)	16 (76.2)	3 (100.0)	.003[a]
18.5–25.0	36 (48.0)	5 (71.4)	11 (78.6)	15 (50.0)	5 (23.8)	—	
≥25.0	2 (2.7)	1 (14.3)	1 (7.1)	—	—	—	
Staff assisting with eating, n (%)							<.001[a]
Yes	27 (36.0)	2 (28.6)	1 (7.1)	11 (36.7)	12 (57.1)	3 (100.0)	
No	48 (64.0)	5 (71.4)	13 (92.9)	19 (63.3)	9 (42.9)	—	
Difficulty swallowing, n (%)							.001[a]
Yes	26 (34.7)	—	1 (7.1)	10 (33.3)	12 (57.1)	3 (100.0)	
No	49 (65.3)	7 (100.0)	13 (92.9)	20 (66.7)	9 (42.9)		

Table 1. Baseline characteristics of patients with AD according to food type

	Food type					P
	Normal (n = 7)	Soft foods (n = 14)	Porridge and side dishes (n = 30)	Liquidized food (n = 21)	Jelly (n = 3)	
No. of patients	3	1	9	2	1	
OR (95% CI) [a]	1.0 (reference)	0.11 (0.01–1.53)	0.58 (0.10–3.42)	0.15 (0.18–1.53)	0.33 (0.19–5.81)	
OR (95% CI) [b]	1.0 (reference)	0.04 (0.01–0.98)[c]	0.32 (0.04–2.99)	0.05 (0.03–0.99)[c]	0.15 (0.02–9.61)	

	Energy intake(kcal/kg/day)		P_{Trend}
	≥30 kcal/kg/day (n = 43)	<30 kcal/kg/day (n = 17)	
No. of patients	10	6	
OR (95% CI) [a]	1.0 (reference)	4.63 (1.40–15.37)[c]	.001[c]
OR (95% CI) b[z]	1.0 (reference)	6.62 (1.55–28.34)[c]	.010[c]

	Protein intake(g/kg/day)		P_{Trend}
	≥1.2 g/kg/day (n = 35)	<1.2 g/kg/day (n = 25)	
No. of subjects	4	12	
OR (95% CI) [a]	1.0 (reference)	4.33 (1.21–15.51)	.002[c]
OR (95% CI) [b]	1.0 (reference)	5.21 (1.20–22.62)[c]	.003[c]

Abbreviations: CI, confidence interval; OR, odds ratio

Table 1. Odds ratios and 95% confidence intervals for the prevalence of malnutrition according to food type, energy intake, and protein intake per actual body weight

Biography

Tomiyo Nakamura has her expertise in preventing dementia, cancer, and cardiovascular diseases. She was born and raised at Osaka in Japan, and received her Bachelor's degree from the Osaka City University in 1979. After graduating from the university, she worked as a registered dietitian at Public Health Center in Osaka. From 1992 she was engaged as a leader of registered dietitians, in clinical trials targeting cancer at the Osaka medical Center for cancer and cardiovascular diseases, and began to study the relationship between cancer, cardiovascular diseases and nutrition. She obtained her Ph.D. degree from the Osaka University Graduate School of Medicine in 2010. In 2015 she was appointed Professor of Food Science and Human Nutrition, Ryukoku University. Now, she is investigating the relationship between dementia, cancer, cardiovascular diseases and nutrition in cohort studies.

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Association of dietary patterns with mild cognitive impairment and dementia in the elderly: Findings of the Fujiwara-Kyo study

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Background: Aging is associated with cognitive decline, and the elderly can experience Mild Cognitive Impairment (MCI) before the onset of dementia. Ensuring healthy dietary patterns can be important for preventing dementia, but such information is limited in Japan. Here, we thus investigated the relationship between dietary patterns and cognitive decline, especially MCI, in the Japanese elderly.

Methods: This cross-sectional study included 3,136 community-dwelling people aged 65 years and over who participated in a prospective cohort study, titled "Fujiwara-kyo Study". Food frequency was recorded for 1 week, and dietary patterns were extracted using factor analysis. The Mini-Mental State Examination (MMSE) was used to evaluate the cognitive function of the participants and to classify them with dementia or MCI.

Results: Four dietary patterns were identified: the "healthy Japanese diet", "dairy products", "confectioneries and fruits", and "meat-based diet" patterns. The "healthy Japanese diet" pattern, characterized by a high intake of soy products, seaweeds, fish, vegetables, and rice, was found to reduce the presence of dementia. The "dairy products" pattern, characterized by a high intake of milk and dairy products as well as bread but a lower intake of rice, reduced the presence of MCI and dementia. The "confectioneries and fruits" pattern, which comprised a higher intake of confectioneries and fruits, but a lower intake of pasta, noodles, and alcoholic beverages, reduced the presence of dementia only in females. The "meat-based diet" pattern, characterized by a high intake of meat and eggs, reduced the presence of MCI, but only in males.

Conclusions: In this cross-sectional study, the "dairy products pattern" was inversely associated with the presence of MCI in both males and females. The "meat-based diet" pattern was inversely associated with the presence of MCI only in males, probably due to malnutrition effects. Further investigations at the nutrient level are needed to confirm these findings.

Biography

Nobuko Amano, Associate Professor of Department of Clinical Nutrition and Dietetics, Faculty of Clinical Nutrition and Dietetics, Konan Women's University, Japan, and received her Bachelor's degree from the Doshisha Women's College of Liberal Arts in 1975. After graduating from the College, worked as a registered dietitian at public health center in Nara. Since 1997, she belongs to the university that she develops registered dietitians and continues his research on nutritional epidemiology. She has received research encouragement prize from the Japan Dietetic Association in 2010, and the Japan Dietician Training Facility Society in 2015.She became the core researcher of the cohort study for 4,500 elderly people in Nara Medical University from 2006 (Fujiwara-kyo study) and began to study the relationship between dementia and nutrition. She obtained her Ph.D. degree from the Nara Medical University Graduate School of Medicine in 2007.

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How poor oral care is killing our geriatric population, how access to mobile dentistry can change that

Sonya Dunbar

Private practice, USA

Many residents in nursing homes have trouble receiving adequate dental care because of unique oral care challenges, such as cognitive skill, poor staff training about oral care, and difficult clinical situations that arise such as diabetes.

High dental cost also presents a huge obstacle, since Medicaid and Medicare pay very little for dental services. Another challenge is getting residents in wheelchairs and Jeri chairs to the dental office and into a dental chair.

Oral health has a significant impact on physical health and mental health including self-esteem and overall quality of life. In addition, there are many systemic diseases that have been directly linked to poor oral health such as aspirated pneumonia which sends many elderly people living in nursing homes to the hospital it is also probably the most common sequelae of poor oral health in the aged person. The plaque build-up on teeth has been found in the lungs of residents with pneumonia due to poor oral care.

Access to oral care is not only needed but critical for most seniors living in long-term care facilities. Mobile dentistry is now on the rise to provide this much-needed care.

Augmented reality technology for people with dementia

Ann Reilly

Monash University, Australia

Background: Augmented Reality technology applies layers of computer-generated visual and/or auditory information to the existing world. Funded by the Australian Government, Augmented Reality technology was trialled to assist people with dementia to increase quality of life and psychological well-being.

Method: Thirty people (n=30) with different forms of dementia or mild cognitive impairment, living in metropolitan and regional Victoria and in different social circumstances, were provided with augmented and/or other assistive technology that was selected and tailored against their personal goals, wishes and intact abilities. Semi-structured interviews and psychometric tests assessing well-being, self-efficacy, functional independence and usability were undertaken with both the person with dementia and his/her family carer at four time points: T0, Pre-Wait Period; T1, Pre-technology; T2, Mid-technology; and T3, Post technology.

Result: This is late breaking research, with T0 - T2 data collected; and T3 data being collected in March 2019. Data analysis will be finalised by June 2019. Qualitative data is being coded and analysed using thematic analyses. Quantitative data is being analysed using repeated measures analyses of variance, in order to evaluate non-equivalence in mean scores across four dependent variables (depressive mood, quality of life measures, functional capabilities and self-efficacy).

Conclusion: This project will provide information on the benefits and challenges of implementing Augmented Reality technology for people with dementia and offer insights into its effect on well-being, quality of life, functional independence and self-efficacy in people with dementia and their family carers.

Temperament, emotional state, masturbation addiction and cyber pornography among college students in South Korea

Baronese Peters

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Statement of the Problem: Sexually explicit material represents a significant part of contemporary internet, with individuals becoming exposed to it at progressively younger ages. This exposure could impact their emotional, psychological and physical health in the long run, leading to the development of addiction and difficulties in connecting with others to form relationships.

Purpose of this study is to evaluate the consumption of cyber pornography in order to identify indicators of addictive behaviour and evidence of guilt about the use of pornography and masturbation.

Methodology: The current study seeked to quantitatively measure the extent of Cyber pornography access among male and female undergraduate students to measure the potential correlations between the extent of Cyber pornography access and indicators of addictive patterns negative affect with personality stats and traits and if the BIS/BAS scale characteristics associated with pornography usage and students will have negative emotions and feel guilty after masturbating.

Findings: An analysis of the BAS/BIS scale factors helped identify the paradox of addiction, leading to the conclusion that there are certain characteristics that can predict the addiction of pornography, such as pleasure, reward, sexual drive or fun seeking as BAS factors or compulsion, lack of self-control and guilt as BIS factors.

Conclusion: This study is salient as it offers new insights on cyber pornography consumption habits of both males and females in a South Korean university and their correlation to masturbation addiction, exploring at the same time the correlation between addictive behavior and guilt.

Recommendations are that future studies evaluate the feelings of guilt and shame after masturbation in relation to other religious confessions, to determine if a correlation exists and to design strategies to support male and female students in distress regarding cyber pornography.

Correlation Matrix of BAS/BIS, Cyber Pornography Addiction, Masturbation Addiction, Positive and Negative Affect (Total)

Variables	Masturbation Addiction	Fantasy and Need for Masturbation	Guilt and Negative Emotions for Masturbation
CP Addiction	.676**	.680**	.602**
Isolated Avoiding Use CP	.668*	.751**	.337***
Compulsive Use CP	548**	.590**	.321**
Guilt Negative Emotions	.452**	.525**	.566**
Cyber Pornography for Chatting	.374**	.444**	.157**
Controllable Use for Cyber Pornography	-.80	-.78	-.59

*$p< .05$, **$p< .01$, CP: Cyber Pornography*

A retrospective chart review of cranial electrotherapy stimulation for clients newly admitted to residential drug treatment

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[2] Fisher Wallace Laboratories, USA

Cranial Electrotherapy Stimulation (CES) has been shown to produce improvements for insomnia, depression, and anxiety among individuals afflicted with these conditions both with and without primary substance abuse dependence. This report presents findings from a retrospective chart review examining the impact of CES on the retention rates of newly abstinent substance dependent individuals in community-based residential treatment. Clients who received CES sessions during their first month in residential treatment exhibited better retention rates during the first 30 days, as well as at 60 and 90 days in treatment, compared to clients who did not receive CES. Sessions were well tolerated and clients reported improved sleep and reduced stress.

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Introducing "Precision Addiction Management (PAM®)" utilizing polymorphic matched alogarithms and Pro-Dopamine regulation to combat Reward Deficiency Behaviors (RDS) including Substance Use Disorder (SUD) globally

Kenneth Blum[*1, 2], **Marjorie C Gondré-Lewis**[2,3,4], **David Baron**[1,2], **DO Lisa Lott**[2], **Jessica Ponce-Rodriquez**[2], **Mark Moran**[2], **Lyle Fried**[5], **Mauro Ceccanti**[2,6], **Raju Hajela**[7], **Rajendra D Badgaiyan**[2,8]

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Research into the neurogenetic basis of addiction identified and characterized by Reward Deficiency Syndrome (RDS) includes all drug and non-drug addictive, obsessive and compulsive behaviors. This keynote presents a new model for the prevention and treatment of RDS behaviors based on objective biologic evidence. Currently, research directed toward improving treatment for highly drug-dependent patients in underserved populations is the basis of an NIH grant awarded to Drs. Kenneth Blum and Marjorie Gondré-Lewis. The grant explores utilization of the Genetic Addiction Risk Score (GARS®) and the neuronutrient pro-dopamine regulator KB220. The development of GARS followed seminal research in 1990, whereby, Blum's group identified the first genetic association with severe alcoholism. The non-invasive GARS test identifies and measures the total number of risk alleles of genes and catabolic enzymes affecting an individual's neurochemical hypodopaminergic function and has been associated in hundreds of studies with RDS behaviors. In an unpublished study, the GARS predicted drug and alcohol severity predisposition as measured by the Addiction Severity Index (ASI) [≤ 4 alleles for Drug & ≤ 7 alleles for Alcohol]. Genotyping data on approximately 1000 subjects [addicted, chronic pain, opioid maintained and non-addicted] will be presented including Italian subjects. "Precision Addiction Management" (PBM®) uses the GARS to customize KB220PAM formulations to deliver putative dopamine homeostasis based on developed algorithms matched to polymorphic results. Presented evidence derived from animal and human studies using BOLD neuroimaging and behavioral methodologies, support homeostatic activation of brain dopamine in the reward circuitry by KB220PAM, as well as anti-substance seeking and modification of RDS behaviors. RDS encompasses behaviors like PTSD, ADHD, over-eating, shopping, hoarding and related RDS cognitive insults. Combating the drug crisis requires PBM across ethnic groups, to bring dopamine homeostasis to those born with RDS predisposition. It is the goal through this novel model that by using PBM the addiction field will have a synergistic tool along with MAT or even alone, to overcome dopamine dysregulation either surfeit (adolescents) or deficit (adults) by the induction of "dopamine homeostasis.