CCT AND BDNF DURING BED REST: PROTECTING AGING INDIVIDUALS FROM ACUTE STRESS


During acute stress (such as 14 days of horizontal bed rest, BR) plasma level of the neurotrophin brain-derived neurotrophic factor (pBDNF) was demonstrated to increase in older, but not younger adults. We hypothesized that this increase might represent a mechanism of brain protection, and that performing computerized cognitive training (CCT) would alter this pBDNF increase. Thus 16 older adults (healthy volunteers) were divided into two groups: CCT (59.1 ± 3.6 years old) and control (C) group (59.1 ± 2.5 years old). All subjects underwent 14-day BR; the CCT group performed 45 min/day of spatial navigation task. PRE- and POST-BR pBDNF, muscular mass, neuromuscular function and metabolic parameters were measured.

There was a significant interaction effect between time and group (p= 0.011) on pBDNF levels, that increased POST-BR for C (p=0.009) but not for CCT (p=0.281) group. CCT group showed anti-insular modifications in metabolism (increase in plasma glucose) whereas C group showed an increase in fat mass and decrease in plasma triglycerides. Muscle mass decreased in both groups. There was a negative correlation (r=-0.821) between POST-BR maximal explosive power of lower limbs and pBDNF in CCT group and a positive correlation in C group (r=0.810). Finally, only in C group, the variation of maximal voluntary contraction of knee extensors negatively correlated with pBDNF variation (r=-0.905). Our data seem to support the concept that if an external protection for brain occurs (i.e. CCT) there is no pBDNF increase, however if no CCT takes place pBDNF increase is associated to a certain preservation of neuromuscular function.

ASSOCIATIONS BETWEEN APOE GENOTYPE AND PSYCHOLOGICAL CONSEQUENCES POST STROKE

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The contribution of genetic factors such as the presence of ApoE E4 allele and its association with cognitive impairment post stroke remains inconclusive generally and is unknown within Middle-Eastern regions. This study examined the association of ApoE genotype with cognitive impairment and mood in stroke patients and compare these functions to healthy older adults.

A prospective stroke sample of n=50 patients (case group) and n=50 healthy ageing individuals (control group) were recruited from the largest Medical Complex in Bahrain. A neuropsychological battery of cognitive assessments (including pre-morbid, global and executive cognition), were conducted on all participants, and then stratified by cognitive function: no cognitive impairment, mild cognitive impairment and moderate to severe cognitive impairment. Anxiety and depression were assessed using the Hospital Anxiety and Depression Scale (HADS).

The most frequent ApoE genotype was E2/3 in both case (44%) and control groups (63%). No statistical significant association was found by cognitive impairment stratification and ApoE genotype for either case or control groups. ApoE genotype E2/4 had worse cognitive function ($\chi^2 (3) = 8.29$, p<0.05) in the control group. A statistical significant difference was found between ApoE genotype and total anxiety scores in that ApoE genotype E3/3 were highly anxious in the case group ($\chi^2 (2) = 6.77$, p<0.05).

The presence of ApoE genotype E4/3 and E4/4 was low to non-existent in this Bahrain sample explaining why no significant associations were found with cognitive impairment. Further examination of mood dysregulation and ApoE genotype polymorphism may be warranted.

DEVELOPMENTAL PROGRAMMING ACCELERATES BRAIN AND CARDIAC AGING IN THE NONHUMAN PRIMATE

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Decreased fetal nutrient delivery leads to developmental programming. We hypothesized that programming predisposes to premature brain and cardiac aging. We developed baboon offspring of mothers fed ad lib (control) or with reduced nutrition of 70% control diet during pregnancy and lactation, resulting in intrauterine growth restriction (IUGR). MRI data from 29 control (CTL) baboons (aged 4–22y; human equivalent 16–88y) were used to construct a reference curve for brain aging. We also studied IUGR baboons (8 male, 8 female) age 5.7 y and CTL offspring (8 male, 8 female), age 5.6 y with MRI to evaluate left ventricular (LV) and right ventricular (RV) functional parameters, normalized to body surface area. Premature brain aging by +2.7 y (p<0.01) occurred in young adult female IUGR offspring vs. CTL. Cardiac data are presented for CTL, IUGR, OLD, mean ± SEM: left ventricular ejection fraction (58 ± 3%, 45 ± 2%, 50 ± 3%), filling rate (88.8 ± 7.1mL/s2, 63.5 ± 7.0mL/s2, 62.0 ± 7.3mL/s2), right ventricular ejection fraction (49 ± 2%, 32 ± 3%, 39 ± 3%) and stroke volume (26.5 ± 1.8mL/m2, 20.0 ± 1.8mL/m2, 17.5 ± 2.2mL/m2) were all decreased (p < 0.05) similarly in IUGR and OLD. To our knowledge these cohorts are the first to reveal both premature brain and cardiac functional aging by young adulthood resulting from developmental programming and IUGR in any species. Further studies across the life-course will determine progression of cardiac dysfunction. These and other multi-organ non-invasive in-vivo aging related biomarkers we are developing will reveal determinants of premature aging and aid the development of preventive interventions and pharmacological treatments on an individualized basis.

SESSION 4520 (POSTER)

PHARMOCOLOGY

APPROPRIATENESS OF PROTON PUMP INHIBITOR USE IN A PSYCHOGERIATRIC POPULATION

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IAGG 2017 World Congress
Inappropriate medication use is the use of a medication where the potential risks associated with use outweigh the potential benefits. Inappropriate medication use among older people is known to contribute to adverse health outcomes including hospitalisation and death. Proton pump inhibitors (PPIs) are medications which are commonly used to treat gastric-acid related disorders. Long-term use of PPIs has been associated with several risks including *Clostridium Difficile* infection, pneumonia, kidney disease and potentially dementia. Inappropriate PPI use is common in older people with up to 80% of patients using a PPI inappropriately. This study explored the appropriateness of PPI prescribing in an inpatient psychogeriatric population which is a vulnerable and understudied patient cohort. Pilot data obtained from 67 inpatients showed that 33% of patients were using a PPI at the time of admission. PPI use was found to be potentially inappropriate in 68% of cases. Un-investigated GORD was the most commonly identified inappropriate indication with 41% of patients using a PPI for this reason. The average frailty score was increased by 10% and the Katz index for independence in activities of daily living was reduced by 15% in PPI users compared to non-users. Both nationally and internationally, PPIs are listed as the most commonly prescribed medications and the costs to the government and the individual are significant. This study demonstrates that there is an opportunity to deprescribe PPIs in psychogeriatric patients which would not only reduce the risk of adverse health outcomes but also result in significant cost saving.

PHARMACOLOGICAL IMPACT OF HOSPITALIZATION IN AN ACUTE GERIATRIC UNIT


The impact of hospitalization on the treatment of elderly patients has not been widely studied. Previous studies examine some treatment characteristics in an isolated way and also provide mixed results and few until now have explored the modification of treatments during hospitalization with a mixed comprehensive approach. We have conducted a retrospective observational study in 235 admitted patients, and compared polypharmacy (≥5 and ≥10 drugs), potentially inappropriate prescribing or potentially omitted prescription (PIP-POP), drug interactions, the use of drugs with impaired renal function and the anticholinergic load of the treatments before and after admission to hospital. Their relationship with mortality, readmissions and emergency visits after a six-month follow-up were also analyzed by multivariate logistic regression. We found that the total number of drugs increases (9.1 vs. 10.1; p<0.001), without increasing chronic drugs (8.3 vs. 8.3). There were no significant variations in the number of patients with polypharmacy (86.5% vs. 82.2%), those who presented inappropriate prescribing criteria (68.5% vs. 71.5% STOPP; 58% vs. 58% START) or those presenting interactions (82.5% vs. 83.5%). Those receiving drugs with anticholinergic effect tend to increase but without reaching statistical significance (39.5% vs. 44.5%; p=0.064). An association was found between hyperpolypharmacy and the risk of re-admission (OR 2.302; 95% CI 1.197-4.425), and emergency visits (OR 1.928; 95% CI 1.049-3.546).

PREDICTIVE FACTORS FOR THE PRACTICAL MANAGEMENT OF THE ANTICOAGULANT THERAPY IN FRAIL OLD PATIENTS

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Purpose: Preventing embolic cerebral infarction is important since it decreases activity of daily living and quality of life in old people. However, appropriate use of anticoagulants is difficult in frail old people because of increasing risk of bleeding events. Thus the present study examined the predictive factor for practical management of anticoagulants in older patients.

Methods: 835 patients aged ≥65 who were admitted to the geriatric ward of The University of Tokyo Hospital between 2013 and 2015 were enrolled. 100 patients (men 48%, mean age 84.4±7.4 years) had atrial fibrillation. We followed the patients ≤3 years after baseline. Major gastrointestinal bleeding, stroke and all cause mortality were investigated for outcomes. Comprehensive geriatric assessment was performed and frailty was evaluated by BMI, IADL scale and Barthel index, MMSE, vitality index, GDS15, fall risk index, history of fall and by living alone or not.

Results: Among them, 44% were taking anticoagulant therapy. There was no significant difference between with or without anticoagulant therapy in all three outcomes. The fall risk index had an increased risk of major gastrointestinal bleeding (adjusted hazard ratio 1.8, 95% confidence interval 1.1 to 4.5) and MMSE was increased risk of stroke (adjusted hazard ratio 0.8, 95% confidence interval 0.6 to 1.1), a history of fall was increased risk for all cause mortality (adjusted hazard ratio 5.6, 95% confidence interval 1.1 to 26.7).

Conclusions: Fall risk index, MMSE and history of fall might be the predictor factors for practical management of anticoagulants in frail old people with atrial fibrillation. Further studies are needed to clarify the medical appropriateness of anticoagulants.

CHANGES OF NITRIC OXIDE SERUM LEVELS WITH SSRI USE IN GERIATRIC OBSESSIVE COMPULSIVE DISORDER

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Nitric oxide (NO) is an inflammatory mediator, shown to have a possible role in pathophysiology of some psychiatric disorders such as obsessive compulsive disorder (OCD). Some studies on animal models have shown that increased NO production could lead to reversed effect of selective serotonin reuptake inhibitors (SSRIs). This study tries to assess the correlation of NO serum levels with the use of SSRIs in geriatric OCD.