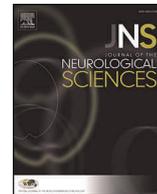


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## Dementia

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WFN15-0177

## Dementia

## Profile and determinants of neurocognitive dysfunctions in a sample of adult nigerians with heart failure

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**Background:** African patients with heart failure (HF) are younger, have lower socio-economic and educational level as well as high prevalence of hypertension related aetiology. However, the prevalence and pattern of cognitive dysfunction among sub-Saharan African patients with HF have not been evaluated against this background.

**Objectives:** To determine the one year prevalence and the factors contributing to cognitive dysfunction in a cohort of Nigerian patients with heart failure.

**Materials and methods:** Cognitive performance was evaluated in 111 consecutive individuals (60 HF patients and 51 age, gender and level of education matched controls) using the community screening interview for dementia (CSI'D), Word List Recall (WLR), Boston Naming Test (BNT) and Modified Token Test (MTT). Other clinical and disease specific variables were collated and correlated with cognitive performance. Patients and IRB approval were obtained.

**Results:** The mean total CSI'D, WLR, BNT and MTT scores were significantly lower among HF patients ( $p < 0.001$ ). The prevalence of global cognitive dysfunction was 90.0% in HF and 5.9% among controls (OR 15.3, 95%CI = 5.08–46.01). Elevated systolic blood pressure, increased comorbidity index and wide pulse pressure were significantly associated with poorer performance on at least one neuropsychological battery. Using a multivariate linear regression analysis, pulse pressure retained its significance ( $p = 0.029$ , 95%CI =  $-0.117$  to  $-0.007$ ) as the most important predictor of cognitive dysfunction in the cohort of HF patients.

**Conclusion:** Cognitive dysfunction is prevalent. Regular cognitive screening is advocated among this high risk group. Controlling comorbidities as well as blood pressure may improve cognitive performance among patients with HF.

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WFN15-1007

## Dementia

## Abbreviated boston naming test as a visuospatial screening tool for cognitive impairment

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**Background:** Boston Naming Test (BNT) is a widely used neuropsychological assessment tool to measure confrontational word retrieval in individuals with language disorder. In our routine clinical practice, we often find different answers for lack of recognition of some of the items. We selected those figures that generated more difficulty for patients and we design a shortened version as visuospatial test screening.

**Objective:** The aim of this study was to analyze the usefulness of this tool for diagnosing cognitive impairment.

**Material and methods:** We included all outpatients with mild-Neurocognitive Disorder (mNCD) according DSM-5 criteria that were assessed from September 2013 to December 2014. All cases were evaluated with a comprehensive neuropsychological battery, brain MRI and the "shortened visuospatial version of BNT" (SVBNT) that consists of 7 items (sharpener, volcano, snail, escalator, muzzle, pacifier, harmonica). We evaluated: a recognition score (RS), all spontaneous answers (SA) and number of items (NI) with different SA. This group was compared with Normal Controls (NC). Patients with mNCD with Lewy Bodies (LB) and mNCD due others etiology also were compared.

**Results:** Men age was  $72.63 \pm 6.9$  years and 80 (61%) were females. No differences in sex or age between groups were found. Statistically significant differences were found between NC ( $n = 42$ ) and mNCD ( $n = 89$ ) in: SR ( $p 0.0001$ ), SA (0.001) and NI (0.002). No significant differences between mNCD with LB ( $n = 37$ ) and others mNCD ( $n = 52$ ) were found.

**Conclusion:** Our SVBNT is a useful visuospatial screening tool to detect cognitive impairment. More studies are necessary to validate this data.

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319

WFN15-0954

## Dementia

## Alzheimer's dementia imaging assessment with fractional anisotropy of the corpus callosum

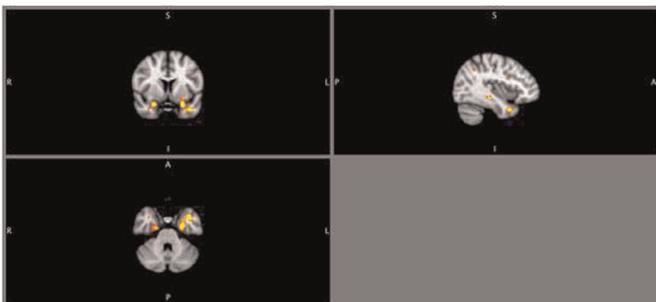
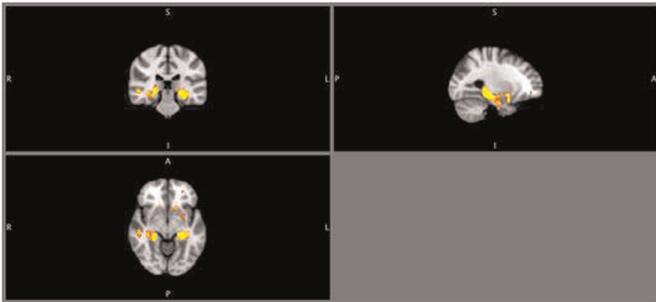
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**Purpose:** Pilot study fractional anisotropy of the corpus callosum in subjects with Alzheimer's disease.

**Method:** 3 control subjects and six with clinically suspected diagnoses of Alzheimer's disease referred to memory clinic and imaged as part of the usual evaluation protocol, were studied with diffusion tractography due to unclear history of previous small vessel disease. MRI studies were carried out at 3 T, including localisers, axial T2, sagittal 3D T1, coronal FLAIR, axial GET2 and DWI for tractography in 32 directions. Quantifiable variables included degree and patterns of atrophy according to Global Cortical Atrophy (GCAS) and Scheltens (S) scales, presence of small vessel disease measured with Fazekas scale and fractional anisotropy of the corpus callosum. Additional variables included ACE-III scores. Diagnoses of AD were confirmed with SPECT-HMPAO scans only in those subjects with suspected dementia. Forward stepwise multiple regression test was run considering FA as dependent and GCAS, S, Fazekas and ACE-III as independent variables.

**Results:** Regression was found between FA and GCAS with  $R = .98$ ,  $R^2 = .97$ ,  $F = 65.60$ ,  $t_{(2)} = 23.86$ ,  $p = .0018$  (Fig. 1). No regression was found with the other variables. Mean FA values were 700 for the controls, 550 for prodromal AD, 410 for mild and 340 for moderate cases of AD. Mean values for the other variables shown in noted in Table 1.

**Conclusion:** Findings suggest FA values as a potential reliable quantitative indicator of neurostructural indemnity of the callosal tracts showing in this pilot study a high correlation with GCAS in subjects with AD.



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## 321

### WFN15-0104

#### Dementia

#### Relationship between cognitive impairment and instrumental activities of daily living (IADL): sabe bogotá, colombia study

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**Introduction:** In the elderly, the impairment of instrumental activities of daily living (IADL) is associated with cognitive impairment, however some of these activities are altered to a greater extent and during earlier stages. The identification of these activities could help to make more concise and accurate early diagnosis.

**Objective:** Identify the main IADL affected in older adults with cognitive impairment and evaluate the associations between them.

**Methods:** Data was analyzed from the SABLE Bogotá Study (2012), including 2,000 older adults ( $\geq 60$  years) in a cross-sectional study, collecting a probabilistic cluster sample, with a coverage of 81.9%. We used: the modified Mini Mental State Examination (MMSE-M) instrument and 13 IADL. We performed bivariate and multivariate analyses with logistic regression models to identify statistically significant associations ( $p < 0.05$ ).

**Results:** The IADL association were -not being able to: "use the phone" OR 5.007 (95% CI 3.01-8.32), "manage his/her own money" OR 2.58 (95% CI 1.57-4.23), "prepare meals alone" OR 1.83 (95% CI 1.11-3.02), "take their own medications" OR 1.83 (95% CI 1.06-3.02), and "doing heavy work at home such as wash the floor or walls OR 1.696 (CI 1.075-2.75).

**Conclusion:** The IADL associated with cognitive impairment were those requiring greater capacity for abstraction and planning. This information can be helpful for the clinician to optimize the time of the interview during consults and ordering of diagnostic studies for ruling out or make an early diagnosis.

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## 322

### WFN15-0188

#### Dementia

#### The role of inflammation and free radicals in ad type of dementia

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**Background:** The pathogenic action of toxic free radicals is one of the hypotheses put forward to account for the onset of Alzheimer's (AD) dementia.

**Purpose:** Study aimed at investigation of blood several free toxic radicals relation with cognitive decline in probable AD patients.

**Methods:** The total of 75 probable AD patients had been investigated. Diagnosis was established according to NINCDS-ADRDA criteria. Brain visualized by conventional MRI. Neurological and neuropsychological examination had been performed. Cognitive status was researched 2 times with 1 year period between examinations by MMSE. Control comprised 30 age matched healthy persons. Blood free radicals: Hydroxyl radical (OH<sup>-</sup>) and lipoperoxyradical (LOO<sup>-</sup>) were researched 2 times in accordance with cognitive examination

by Electron Paramagnetic Resonance (EPR) method. The  $\alpha$ -phenyl-tert-butyltriton (PBN) (SIGMA) was used as LOO- trap. EPR signal intensity was measured in millimeters on milliliter blood matter. Statistics performed by SPSS-11.0.

**Results:** During both examinations EPR signals of blood free radicals OH- and LOO- found to be significantly higher in AD patients as compared to control ( $p < 0.001$ ), while the second examination of AD patients showed the increased EPR signals of LOO- against the first data ( $p < 0.05$ ) but the EPR specters of OH- were non-significantly increased ( $p > 0.05$ ). Positive correlation revealed between the blood LOO- and the cognitive decline in selected AD patients ( $r = +0.47$ ;  $p < 0.05$ ).

**Conclusion:** Membrane lipid degradation product lipoperoxyl radical (LOO-) seem to be involved in cognitive decline in Alzheimer's type of dementia.

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WFN15-1029

Dementia

**Memory impairment at initial clinical presentation in posterior cortical atrophy**

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**Background:** Diagnostic criteria for posterior cortical atrophy (PCA) emphasize core visuospatial and visuoperceptual deficits not attributable to ocular disease, and relatively preserved episodic memory. Longitudinal studies have suggested that anterograde memory is not impaired in the early stages, and gradually deteriorates with progression of disease. However, variable findings have been reported regarding memory performance in PCA.

**Objective:** To examine memory and visuospatial performance at presentation in PCA patients compared with early-onset Alzheimer's disease (EOAD) patients and healthy controls.

**Patients and methods:** 14 PCA patients, 28 EOAD patients and 38 healthy controls were recruited. All patients met diagnostic criteria with supportive neuroimaging. Patients were administered the Addenbrooke's Cognitive Examination (ACE) at clinical presentation, incorporating tests of memory and visuospatial skills. Patients were matched for symptom duration (mean = 2.6 years). Institutional Review Board (IRB) approval was obtained.

**Results:** Both PCA and EOAD patients were impaired compared with controls on the ACE total score ( $p < .001$ ), on visuospatial skills ( $p < .001$ ) and on memory ( $p < .001$ ). There was no difference between patient groups on ACE total score ( $p = .823$ ). As expected, PCA patients were more impaired on visuospatial skills than EOAD patients ( $p < .001$ ). However, there was no significant difference between patient groups ( $p = .238$ ) on the memory subscore. Memory impairment was evident in 11/14 PCA patients (79%).

**Conclusion:** Misdiagnosis in PCA is common. The presence of memory impairment early in the disease may assist in the recognition of PCA and reduce diagnostic delay.

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WFN15-0936

Dementia

**Impact of obstructive sleep apnea syndrome on cognitive function in patients with dementia with Lewy Bodies (LBD)**

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**Background:** Some previous studies showed an association of sleep-disordered breathing with decreased cognitive function among patients with dementia. However, there are conflicting reports about the impact of this disorder on various cognitive functions, and any previous research was found in patients with LBD.

**Objective:** The aim of this study was to determine the impact of the severity of sleep apnea on cognitive performance in a sample of patients with LBD.

**Material and methods:** Consecutive patients with diagnosis of mild LBD that have been studied in our sleep unit during 2014 were included.

All patients were evaluated with a comprehensive neuropsychological battery including tests for memory, attention, verbal fluency, abstract thinking, visual-spatial and executive functions.

All cases underwent one night polysomnography to detect sleep apnea/hypopnea, measured with apnea-hypopnea index (AHI).

We analyzed the association between AHI and deficit in each cognitive function, considering 3 groups: AHI > 15; AHI > 5 and AHI < 5 using a statistical program SPSS. ( $p < 0.05$ ).

**Results:** Thirty six patients were included. 14 were females (39%) and mean age was 71,39 + - 7,6.

The groups showed no significant differences in age, sex and education.

We found a significant association between memory deficit and AHI > 15 ( $p < 0.05$ )

The other functions didn't show significant associations in any group.

**Conclusion:** Our results suggest that in patients with LBD, memory is the only domain affected by the presence of sleep-disordered breathing, and this only occurs when the breathing disorder is severe.

Future studies with more patients and other dementias should be made.

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WFN15-1066

Dementia

**Impact of sleep characteristics on cognitive performance in Mild Cognitive Impairment (MCI)**

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**Introduction and objectives:** Cross-sectional studies generally associate poorer sleep quality with lower level of neuropsychological functioning in healthy ageing subjects. However, the relationship between sleep quality and cognitive performance in MCI patients, has not been fully established.

The aim of this study was to determine the impact of sleep characteristics on performance in neuropsychological tests, in a sample of patients with MCI.

**Material and methods:** We recruited consecutive patients with diagnosis of MCI according to Mayo Clinic criteria between January and December 2014.

Patients underwent one night polysomnography and a neuropsychological battery, including RAVLT, Digit Symbol (DS), digit span, block design and similarities subtest (WAIS), Trail Making Test AB (TMA -TMB), verbal fluency tests, and Wisconsin Card Sorting Test.

Sleep measures were scored from the polygraphic records according to conventional criteria including sleep stage time, REM latency (RL), the arousal index, and sleep efficiency(SE).

Pearson correlation analysis, ANOVA and Chi 2 were performed. ( $p < 0,05$ ).

**Results:** The mean age of 36 subjects was  $67,28 \pm 8,16$  years and 20 were females (55.55%).

SE positively correlated with MMSE's score ( $r = 0.36$ ), DS ( $r = 0.38$ ), block design ( $r = 0.41$ ) and inversely correlated with TMTA ( $r = -0.39$ ), number of false recognition responses ( $r = -0.37$ ) and sum of intrusions( $r = -0.41$ ) in RAVLT.

RL is inversely correlated with TMTA( $r = -0.36$ ).

The other sleep variables showed non correlations with results of cognitive tests.

**Conclusion:** In our sample, MCI patients with lower sleep efficiency showed worse performance in visuospatial skills, executive functions and orbitofrontal functioning, while a longer RL correlated with better performance in attention.

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### 326

#### WFN15-0046

##### Dementia

##### Pain assessment in patients with dementia

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**Background:** Pain severely impairs quality of life, increases delirium risk and may lead to progression of dementia. Assessment of pain performed by taking anamnesis is not reliable in dementia patients due to cooperation and communication problems. Therefore, pain is usually underdiagnosed in dementia patients.

**Objective:** The aim of this study was to assess pain in dementia patients.

**Method:** Seventy five nursing home residents with dementia were enrolled. After comprehensive geriatric assessment presence of pain was asked, PAINAD(Pain Assessment in Advanced Dementia), DS-DAT(Discomfort Scale for Dementia of the Alzheimer's Type), PADE(Pain Assessment for the Dementing Elderly), FACES(Wong-Baker Faces Pain Rating Scale), and NS(Numeric Rating Scale) tests were performed.

**Results:** Mean age was  $81.1 \pm 7.0$  and 46.7% was female. Thirty two percent of the patients were at early stage, 24% at moderate stage, and 44% at severe stage. Number of patients that declared they had pain was 23, however, PADE, PAINAD, DS-DAT pain scales scores were similar between groups declaring and not declaring pain. Number of patients declaring pain was lower in moderate and severe stage (early stage 48.7%; moderate stage 22.2%; severe stage 27.3%). However, scores of PADE, PAINAD, and DS-DAT were significantly higher in severe stage showing the presence of pain ( $p < 0.001$ ).

**Conclusion:** These results demonstrate that in dementia patients

pain is not rare, but they are not usually capable of expressing it, especially in the severe stage. For pain assessment in dementia, anamnesis is not sufficient, objective pain assessment scales developed for dementia should be routinely used.

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### 327

#### WFN15-1220

##### Dementia

##### Prevalence of cognitive impairment in tremembe, Brazil

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**Background:** Dementia is one of the major health issues due to the rapidly growing elderly population. The aim of this study was to ascertain the prevalence of cognitive impairment no dementia (CIND) and dementia in a community-dwelling elderly in Brazil.

**Methods:** This was a single phase epidemiological study with the elderly (aged  $\geq 60$  years) living in the municipality of Tremembé, Brazil. Twenty percent of the households with elderly were randomly selected from urban and rural areas, in order to obtain a homogeneous representation of all socioeconomic and cultural levels. In addition to clinical and neurological evaluations, questionnaires were applied to informants to assess functional activities (Informant Questionnaire on Cognitive Decline in the Elderly [IQCODE] and Pfeffer Functional Activities Questionnaire); and neuropsychological tests were administered to participants (Brief Cognitive Screening Battery, Mini-Mental State Examination, verbal fluency test and clock drawing test) along with psychiatric rating scales.

**Results:** We assessed 630 individuals (mean age, 71.3 years; mean years of education, 4.9) and found prevalence rates of 17.5% (95% CI: 14.6 - 20.6) for dementia and 19.5% (95% CI: 16.6 - 22.8) for CIND. These prevalences were influenced by age ( $p < 0.001$ ) and by educational level ( $p < 0.001$ ). There was no significant gender difference among diagnostic groups ( $p = 0.166$ ). Diagnosis of dementia was significantly associated with low socioeconomic status, stroke, previous psychiatric disorder, alcoholism, and epilepsy, while diagnosis of CIND was only associated with stroke.

**Conclusions:** The prevalence of dementia in this study was higher than in other studies, particularly among younger elderly.

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### 329

#### WFN15-0680

##### Dementia

##### Sliencing SOAT1 attenuates B-amyloid-induced toxicity in neuroblastoma SH-SY5Y cells through regulating MAPK signaling

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Extracellular amyloid plaque is a major pathological hallmark in Alzheimer's disease. Aggregates of A $\beta$ , the main constituent of amyloid plaques, is believed to play a pivotal role in the pathogenesis of AD, thus the suppression of which might be useful for the treatment of AD. The mechanism of A $\beta$ -induced neurotoxicity is complex and remains obscure, consequently, the present study is trying to evaluate the neuroprotective effect of knocking down SOAT1

on A $\beta$ 25 – 35-induced neuronal injury and the possible mechanism in the human neuroblastoma SH-SY5Y cells. qPCR, RT-PCR, immunofluorescence, and Western blotting were used to investigate the expression variation of SOAT1 and PTGS2 in SH-SY5Y after exposure to A $\beta$ 25-35. We constructed the expression regulatory network of SOAT1 through eQTL and genetic correlation analysis. Furthermore, there were 712 genes expression variation highly correlated with both SOAT1 and PTGS2, which were involved in MAPK and Erk pathways. Our results showed that silencing SOAT1 significantly attenuated A $\beta$ 25 – 35-induced cell death and reduced neuronal apoptosis. Furthermore, down regulation of SOAT1 could partially reverse the elevations of A $\beta$ 25 – 35-induced active COX-2 expressions in model of neuron injury in vitro and which may be due to the regulation of CACNA1E through NF- $\kappa$ B signaling cascade that has been demonstrated to play a key role in the generation and regulation of proinflammatory mediators including COX-2, activation of the NF- $\kappa$ B signaling cascade is associated with the activation of MAPKs, which consequently phosphorylate and activate other kinases or stimulate downstream transcription factors resulting in the alteration of the target gene expression.

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WFN15-0333

Dementia

**Dietary patterns and conversion from amnesic mild cognitive impairment to dementia: a credos study**

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**Background:** There is a little information on the association of dietary patterns with conversion from mild cognitive impairment (MCI) to dementia in Asian people. The objective of this study is to evaluate the association of dietary patterns with conversion from amnesic MCI (aMCI) to dementia.

**Methods:** A total of 219 aMCI patients enrolled from 31 memory clinics using the standard assessment and diagnostic processes were followed for incident dementia for mean (SD) 15.4 (6.0) months. Demographic and vascular risk factors were evaluated and dietary patterns were also investigated using 10-item Mini Dietary Assessment Index (MDAI) questionnaire at baseline in all patients.

**Results:** Seventy-one (32.4%) patients were converted to dementia and 68 (95.8%) of them were converted to AD dementia. In a multivariate model adjusted for age and MMSE score, compared to subjects who rarely ate vegetables other than Kimchi at meal, subjects who often ate vegetables other than Kimchi at meal had 58% (HR, 0.42; 95% CI, 0.23-0.80;  $p = 0.008$ ) less risk of developing AD, while those who always ate vegetables other than Kimchi at meal had 55% (HR, 0.45; 95% CI, 0.24-0.84;  $p = 0.01$ ) less risk of developing AD. In a multivariate model adjusted for age and MMSE score, compared to subjects who ate only what they wanted, subjects who had a balanced diet had 57% (HR, 0.43; 95% CI, 0.22-0.87;  $p = 0.02$ ) less risk of developing AD.

**Conclusions:** Higher adherences to eating vegetables at meal and having a balanced diet are associated with reduced risk for MCI conversion to AD.

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332reviewed

WFN15-0202

Dementia

**The identification of a possible biomarker for cognitive impairment**

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Alzheimer's disease is a non-curable neurodegenerative disease, hence there is a constant search for novel therapies. However, the lack of reliable biomarkers has made the evaluation of new treatments difficult. The aim of our study was to use an animal model to search for a novel biomarker that reflected the cognitive impairment of Alzheimer's disease. The Ethics Clearance number was 011/13/Animal. **Sprague–Dawley** rats, received 10  $\mu$ l of  $\beta$ -amyloid (88.63 mg/ml) directly into the dorsal hippocampus to induce cognitive impairment. Spatial learning and memory tests were conducted with the Morris Water Maze (MWM) before and after the bilateral intra-hippocampal injections. Control animals received 10  $\mu$ l of saline. Animals were sacrificed on day 3, 7, 10 and 14 following the intracerebral injection. Blood was collected via cardiac puncture of the left ventricle. Microwave technology was used to detect the conductivity and dielectric constant of plasma samples collected. Prior to the intra-hippocampal injections, all the animals displayed excellent learning ability in the MWM. On all 4 days tested, all animals exhibited excellent recall of their memory. The average conductivity and dielectric constants of the plasma of  $\beta$ -amyloid treated animals were also similar to controls on all 4 days investigated. Although our study was unable to statistically show that intracerebral injection of  $\beta$ -amyloid into the dorsal hippocampus lead to cognitive impairment, experimental rats have shown a tendency to increase their time to find the platform compared to normal rats. Interestingly, plasma of experimental animals compared to normal plasma has exhibited distinct variation of dielectric constant and conductivity.

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WFN15-0592

Dementia

**Prevalence of cognitive impairment in older adults in rural areas of La Paz, measured with four neurocognitive test**

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**Objective:** To determine the prevalence of cognitive impairment in older adults in the rural area of La Paz.

**Methods:** descriptive cross-sectional study; 367 people  $\geq 60$  years living in rural area of La Paz - Bolivia, September 2013, were applied: Minimalist version Lobo, Fototest, Test Clock, Test currencies. Interview homes. Statistical analysis was performed with SPSS version 20.0.

**Results:** 367 seniors, 54% male, 46% female, mean age 72 years men, 70 years women.

In the Clock Test, 86.4% were unable to perform the test correctly. 6.9% prevalence of cognitive impairment in 2 of the 3 test, 4.5% prevalence of cognitive impairment in 3 of the 3 test, greater involvement in females; age of onset of cognitive decline after 70 years.

**Discussion:** In rural areas they are unaccustomed to wearing the watch, this test is not suitable for application to the rural population. The other test showed good agreement between them. The tests are easy to apply in the rural population, especially the phototest and the test of currencies, due to the low level of education of the population.

Women have a higher incidence of cognitive impairment due to greater illiteracy among women in rural areas. The level of education is an important factor in the development of cognitive impairment. The prevalence that was found is similar to other populations.

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337

WFN15-1517

Dementia

**Dementia and alzheimer's disease (AD). Experience of the memory center of rabat**

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Memory clinics are not very common in the developing world. The purpose of the study is to investigate demographic profile and etiologies of dementia in the Memory Center of Rabat.

We studied all dementia cases presenting between January 2000 and May 2013. Diagnosis of dementia was based on complete neurologic and somatic clinical examination, and neuropsychological assessment. All patients had cerebral imaging (CT Scan or MRI). Routine laboratory tests were performed in all cases and sometimes more analysis for specific etiologies. We used the usual criteria for diagnosis of AD and other degenerative dementias.

We found 561 cases, of which 283 males and 278 females. The mean age was 64.42 years (SD 13.28; range 18 to 95 years). The mechanism of dementia was degenerative in 328 cases (58.5%) including 287 AD, vascular in 95 cases (16.9%), mixed in 42 cases, infectious in 33 cases and inflammatory in 18. Other etiologies were found in 35 cases, and dementia was of undetermined cause in 10 cases. Early-onset dementia (EOD), defined by an age-onset before 65 years, represented 44.7% of our dementia cases.

Our study shows a large diversity of etiologies in dementia. As in developed countries, AD is the first cause of dementia, followed by vascular dementia. Other etiologies, like infectious and inflammatory diseases, are less frequent and mainly diagnosed in EOD. The percentage of EOD is high in our series, perhaps due to selection bias, and shows that dementia needs careful investigations in order to detect the potentially reversible conditions.

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WFN15-1064

Dementia

**Platelets tau mRNA isoforms in neurodegenerative diseases**

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Neurodegenerative diseases have been steadily increasing as life expectancy increases in world population; in this context, the search for treatments and the search for biomarkers for diseases like Alzheimer's and Parkinson's disease has become an increasingly important need. Tau protein is one of the most important biomarkers in CSF, since this protein is directly linked to pathophysiology of many neurodegenerative diseases and several authors have reported characteristic

expression patterns of tau in neurodegenerative diseases<sup>1,2</sup>. Studies aimed by Dr. Farias and cols., have also reported the presence of tau protein in platelets from peripheral blood samples<sup>3,4</sup>. This finding gives rise to a new source of potential non-invasive biomarkers.

Using PCR techniques we have also found the presence of tau mRNA in platelets, and with qPCR we have made quantitative analyses of tau mRNA isoforms (3R and 4R) in carriers of neurodegenerative diseases as well as healthy controls.

These results suggest the presence of a new tool for diagnosis of neurodegenerative diseases. Research financed by project FONDECYT 11130233.

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WFN15-0827

Dementia

**Does sleep deprivation affects residents' cognitive functions?**

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**Introduction:** Sleep deprivation is a usual problem in residents during their training program. Lack of sleep causes failures in attention, low cognitive performance and a deterioration in the ability of trial. The purpose of our study was to analyze the cognitive performance of a group of orthopedic residents before and after a 24 hours on call duty.

**Methods:** We include orthopedic residents and their cognitive functions were evaluated by the following tests: *Continuous Performance Test (CPT 2)*, *Digit Spam (Version 5)*, *1letter phonologic fluency and Pasat test*. All the tests were done after a sleeping period at home of at least 6 hours and after being on call (sleeping less than 3 hours).

**Results:** Nineteen residents were included in the study. The median age was 27 ± 1.89 and 15 were male. The mean hours of sleeping at home was 6.5 (range 6–8) and after on call duty was 1.5 (range 0.5–3). Statistical difference were found in CPT 2 test in terms of commissions (p = 0.007), omissions (p = 0.004) and perseverations (p = 0.036). No significant differences were found in the other tests.

**Conclusion:** Sleep deprivation after 24 hours on call duty affects cognitive performance of orthopedic residents, increasing the number of errors and omissions.

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343

WFN15-1139

Dementia

**Visual memory binding is impaired in healthy elderly**

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**Background:** Aging is associated with changes in the brain, especially in medial temporal lobe leading episodic memory impairment. A part

of episodic memory deficit in older adults may consist of memory binding deficit.

**Objective:** The goal of the study was to assess the visual memory binding performance in healthy young vs. older adults by using a novel test based on association between an item and its tempo-spatial information. The next goal was to characterize a possible influence of hippocampal volume on visual memory binding performance in older adults.

**Methods:** 24 young participants (18–26 years old) and 49 older participants (60–81 years old) without cognitive deficit on standard neuropsychological testing underwent visual memory binding testing composed of three consecutive trials with increasing levels of difficulty (with 3, 5 and 7 items). Older participants underwent MRI of the brain.

**Results:** Participants 60 years and older exhibited worse overall memory binding performance than young participants. Older participants made more errors in spatial position and also in temporal order of items. We did not find any relation between left or right hippocampal volume and visual memory binding scores.

**Conclusion:** We found a visual memory binding deficit in adults 60 years of age and older. The deficit involved both spatial and temporal components of episodic memory. The performance in visual memory binding test was not influenced by hippocampal volume in healthy individuals.

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345

WFN15-0868

Dementia

Vitamin D and progression in Mild Cognitive Impairment (MCI)

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**Background and objective:** Data from cross-sectional and longitudinal studies suggest an association between cognitive impairment and vitamin D (VD) deficiency. However, the association of VD status with MCI conversion to dementia has not been fully explored.

The aim of this study was to investigate the association between serum 25-hydroxyvitamin D [25(OH)D] status and progression of MCI to dementia in older adults.

**Patients and methods:** We evaluated patients with diagnosis of MCI according to Mayo Clinic criteria (Petersen, 2001), who were followed for at least 5 years and healthy controls (HC). MCI patients were classified as amnesic or non-amnesic according to presence of memory deficit at baseline. Levels of VD were recorded. VD deficiency was defined as 25(OH)D < 20 ng/ml, insufficiency as 20 to 30 ng/ml, normal > 30 ng/ml. We compared VD levels of patients converted to dementia with those who remain stable. Both groups were compared with HC.

**Results:** 216 subjects were included, 103 MCI and 113 HC. Mean age were 74,16 ± 6,7, 84,1% were females, without demographic differences between groups. The values of VD were similar in both groups. We found that MCI patients with VD deficiency had higher rates of conversion to dementia than the other groups (p = 0,003). Amnesic MCI patients converted to Alzheimer and non amnesic to non-Alzheimer dementias (p < 0,0001).

**Conclusion:** Our findings suggest a significant association of lower VD levels with progression to dementia in MCI patients. A long-time major placebo-controlled randomized trial of vitamin D supplementation in patients with MCI should be started.

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WFN15-1200

Dementia

Vitamin D and progression in mild-neurocognitive disorder due to lewy body disease

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**Background:** Recent studies have shown that vitamin D (VD) status may be relevant for cognitive performance in older population while other studies are inconsistent. Several reports have been published regarding the role of VD in neuroprotection. We published that treatment with VD can slow the progression to severe stage of Alzheimer Disease. There is not evidence in mild-Neurocognitive Disorder due to Lewy body disease (mNCD-LBD).

**Objective:** Determine the association between serum 25-hydroxyvitamin D [25(OH)D] status and risk of developing dementia in patients with mNCD-LBD.

**Patients & methods:** We evaluated 165 subjects, patients with mNCD-LBD according to DSM-5 criteria who were followed for at least 5 years and healthy controls (HC). Levels of VD and parathyroid hormone (PTH) were established. VD deficiency was defined as 25(OH)D < 20 ng/ml, insufficiency as 20 to 30 ng/ml, normal > 30 ng/ml and hyperparathyroidism as PTH > 65 pg/ml. We compared VD levels in patients who progress to major-NCD with those who did no progress and with HC.

**Result:** Dosages of VD in 82 mNCD-LBD patients, and 83 HC were recorded. No difference between groups in age, gender and education were found. No significant differences in VD levels in mNCD-LBD patients who remain stable and those who progress to major-NCD were found. Neither differences between groups were present.

**Conclusion:** Our study suggests that VD levels have no impact on progression to a more severe stage in mNCD-LBD. This finding should be confirmed in future studies, and compared with other etiologies of cognitive impairment.

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350

WFN15-1093

Dementia

Familial alzheimer's disease in a tunisian population: clinical and genetic patterns

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**Background:** Family history of dementia, along with age are known as non modifiable risk factors of Alzheimer's Disease (AD).

**Objective:** To study the epidemiology of familial AD and its clinical and genetic characteristics in a Tunisian population.

**Methods:** A 12 years retrospective cross-sectional study, including AD patients with a positive family history, at the Neurology department of Razi Hospital. Clinical, neuropsychological and neuroimaging data were analysed. APOE genotyping was performed in all patients with familial AD, and a sequencing of the genes APP, PSEN1 and PSEN2 was performed in patients with early onset autosomal dominant AD.

**Results:** 429 patients with familial AD were included (33.1% of a total 1294 AD). Mean age at onset was 70.5 years ± 10. Sex-ratio = 0.69.

Early onset was found in 25.4%. Consanguinity was found in 34.5%. Autosomal dominant inheritance was found in 16.7%, genetically complex (GC) in 73.3%, and autosomal recessive (AR) in 10%. Atypical AD presentation was found in 4.4%. Median MMSE was 12. APOE genotyping was performed in 150 patients. The distribution of APOE allele frequencies was 69.7%, 28.7% and 1.6% for E3, E4 and E2 respectively. No pathogenic mutation was identified. However, genetic polymorphisms were observed.

**Conclusion:** Familial AD is frequent in our population (one third of the total AD patients). AR inheritance, found in 10% in the present study, has never been studied before. A substantial proportion of autosomal dominant AD patients had a late onset. Further genetic investigations may lead to the identification of new genetic substrate in our population.

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352

WFN15-1010

Dementia

**Prevalence of dementia in Sub-Saharan Africa: systematic review and meta-analysis**

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In 2010, the global prevalence of dementia was estimated at 36 million of people, based on a systematic review and meta-analysis of 154 studies conducted worldwide (Prince et al., Lancet 2013). This study highlighted a dearth of published epidemiologic studies in Africa and a distinctively lower prevalence of dementia in the four Sub-Saharan Africa (SSA) regions (2–4%).

For many years, the only available evidence on the prevalence of dementia within SSA population was from the Indianapolis-Ibadan Dementia Project. At baseline, the age-adjusted prevalence of dementia (2.29%) and Alzheimer's disease (1.41%) in the Ibadan sample were significantly lower than those in the Indianapolis sample (4.82% and 3.69% respectively, in the community-dwelling sample) (Hendrie et al., 1995). However, the evidence has significantly expanded over the last decade, allowing now for a better understanding of the burden affecting this region.

We conducted a systematic review of the literature on the prevalence of dementia in Sub-Saharan African countries. We sought and included population-based studies of the prevalence of dementia among people aged 60 years and over (according to DSM-IV or ICD-10 criteria), for which the fieldwork started on or after 1st January 1980. A random effect exponential (Poisson) model was performed to assess the effects of age and sex on the prevalence of dementia.

Results of this meta-analysis, including the characteristics of the each eligible study, will be presented and discussed. An overview of the burden of dementia and its implications for African populations will be given.

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WFN15-0917

Dementia

**PSEN1 mutation presenting as posterior cortical atrophy**

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**Background:** Posterior cortical atrophy (PCA) is a form of focal atrophy, most commonly associated with Alzheimer's disease (AD) neuropathology; hence it is regarded as an atypical presentation of AD. Other neuropathological entities, such as Lewy body disease (LBD), corticobasal degeneration (CBD), prion disease were also reported as the underlying cause. Familial PCA is rare and there are only a handful of reported cases harbouring a neurodegenerative disease causing mutation.

**Objective:** Our objective is to report a patient with PCA phenotype, who was found to carry L173S mutation in the presenilin 1 gene (*PSEN1*). We have obtained patient/caregiver approval, as necessary.

**Patients and methods / Material and methods:** A 40-year-old lady presented with a 1-year history of progressive cognitive decline, the salient feature of which was topographical disorientation. Her mother died at the age of 45, severely demented after a 7-year history of progressive cognitive decline. A younger, asymptomatic sister was also found to carry the same mutation. Examination revealed multiple cognitive deficits with a simultanagnosic core. Although, her initial MRI scan was normal, FDG-PET revealed a clear-cut precuneus and bilateral parietal hypometabolism. She rather rapidly progressed and within 4 years her dementia severity reached into severe stage.

**Results:** To our knowledge, this patient is going to be the 2nd reported PCA case with a *PSEN1* mutation and 1st with a L173S mutation.

**Conclusion:** This patient, together with the one reported by Sitek et al. in 2013, expands the wide clinical spectrum of *PSEN1* mutations to include PCA phenotype.

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WFN15-0222

Dementia

**Singapore famous faces test- validation for diagnostic purposes in cognitively impaired and healthy controls**

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**Introduction:** Prosopagnosia, in short, face blindness, is an impairment in recognizing familiar faces (Bate & Cook, 2012), with the recognition of other objects remaining intact (Grüter, Grüter, Carbon, 2008). Despite having agnosia being one of the criteria for dementia, there is currently a paucity of available measures in Singapore to assess prosopagnosia causing prosopagnosia to remain undiagnosed in Singapore. There are several measures overseas to assess prosopagnosia, such as the recognition of famous faces (Burns, 2004). However, Psychologists in Singapore cannot use existing overseas tests since they are not culturally appropriate (Burns, 2004).

**Methodology:** 50 participants both normal controls and cognitively impaired were administered this test. *Powerpoint slides including 56 faces of prominent Singaporeans*. Participants were tasked to name and give the reason of fame for each face of prominent Singaporean. Multiple choice were given if they failed to spontaneously answer. The scoring format for both naming and reason for fame is as follows: 2 points for spontaneous answer, 1 point if cues were required and 0 points for incorrect answer. The maximum and minimum score for each face was 4 and 0 points respectively.

**Results:** The mean SFFT score of the three groups Normal, MCI and Dementia were 187.32, 135.91 and 112.14 respectively.

**Conclusion:** The present study showed that subject groups affects the SFFT score, with healthy controls performing the best and persons with dementia performing the worst. This SFFT has to be studied further to establish normative data. SFFT will be an important culturally appropriate neuropsychology tool in Singapore.

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WFN15-0690

Dementia

**Symptoms and progression of alzheimer's disease among south-east asian population: a pakistani study**

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**Background:** Alzheimer's disease is one of the emerging health issues all around the world involving both the developed as well as the developing countries. Little data is available regarding this disease in Pakistan. So the basic aim of our study was to determine the prevalence and clinical correlates of disease among Pakistani population.

**Methods:** This study was conducted at the teaching hospitals of Rawalpindi Medical College, Rawalpindi, Pakistan from Aug 2014 till Dec 2014. A total of 38 patients presenting in the medicine outpatient departments having symptoms of the disease and meeting WHO diagnostic criteria for probable Alzheimer's disease were recruited in the study. 9 patients were using neuroleptics. 29 of the neuroleptics-free patients were re-examined during an 6-month period in order to determine the possible role of extrapyramidal symptom as a predictive factor of the clinical course of the disease.

**Results:** 10 % of the neuroleptics-free patients were free of extrapyramidal symptoms. Most common extrapyramidal symptoms were hypomimia (54%), difficulty in talking (49%), bradykinesia (43%), postural instability (36%), abnormal gait (29%) and rigidity (21%) respectively. No significant differences were found when examining for the presence of resting tremor, dystonia and dyskinesia among neuroleptics positive and free groups. The mean duration of the disease in patients appearing with extrapyramidal symptom was found to be  $2.12 \pm 1.23$  years. The presence of extrapyramidal symptoms increases proportionally with the progression of the disease and cognitive and functional decline.

**Conclusions:** Almost all of the patients who were neuroleptics-positive presented no extrapyramidal symptom, while 90% of the neuroleptics-free patients manifested such symptoms. Patients who presented extrapyramidal symptom at initial examination appeared to deteriorate faster, mainly cognitively, but also functionally.

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WFN15-0595

Dementia

**The possible role of sirtuin 1 in the pathogenesis of alzheimer's disease**

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**Background:** Increasing evidence suggest that AD pathogenesis is not restricted to the neuronal compartment, but includes strong

interactions with immunologically and biochemical mechanisms in the brain.

**Objective:** Recent data shows that patients with of type 2 diabetes (T2D) in the aging population are at high risk of AD. On the other hand sirtuin 1 (SIRT1) pathway has a crucial role in AD. SIRT 1 activity plays a role in the central regulation of glucose metabolism and accumulation of tau.

**Material and methods:** In light of these informations, the possible role of SIRT1 in the pathogenesis of AD is intended to be explained by examination of SIRT1 in human serum. In our study, serum SIRT1 levels in the groups of AD, AD + T2D and controls were measured by Enzyme Linked Immunosorbent Assay (ELISA) method.

**Results:** When compared with the controls, in the groups AD and AD + T2D were significantly decreased levels of serum SIRT1, when compared with the AD and AD + TD2 groups, in the group AD + T2D was significantly decreased level of serum SIRT1. When compared with the AD and AD + T2D groups, in patients with AD + T2D were significantly decreased in mean Mini Mental State Examination (MMSE) score.

**Conclusion:** In accordance our results, the significant decrease in mean MMSE score and serum SIRT1 levels in patient with AD + T2D suggested that sirtuin and insulin resistance might have a role in the pathogenesis of AD and can be a therapeutic strategy to suppress the neurodegeneration in the AD brain.

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WFN15-0273

Dementia

**Factors influencing the survival period in japanese patients with sporadic creutzfeldt-jakob disease**

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Although Japanese cases of sporadic Creutzfeldt-Jakob disease (sCJD) generally involve longer survival periods compared to those from other countries, details regarding the factors influencing survival are unclear. To determine the influence of certain factors on survival, we retrospectively assessed 51 Japanese MM1-type sCJD patients with respect to background, clinical course, and disease management. No significant differences were found between men and women, tracheotomy and nontracheotomy patients, or patients treated in public and other types of hospitals. Although the survival period of tube-fed patients was significantly longer than that of patients who were not tube fed, survival of patients fed via a nasal tube did not differ significantly from that of gastrostomy-fed patients. The proportion of tube-fed patients was 68.6% (35/51). Disease duration was not significantly associated with age or year of onset. However, it was associated with time from onset to first recognition of myoclonus, first recognition of periodic sharp-wave complexes on electroencephalogram, and progression to the akinetic mutism state. Mechanical ventilation was not performed for any patient. Because the total disease duration increased in cases with a slowly progressive clinical course as a natural outcome, we concluded that the most crucial factor contributing to the prolonged survival of Japanese sCJD patients was tube feeding once the akinetic mutism state had been reached.

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WFN15-0730

**Dementia****Factors contributing to improve the quality of life in dementia-free centenarians**

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**Background:** There are dementia-free centenarians despite the substantial presence of neuropathological evidence of dementia, suggesting the existence of cognitive reserve. Longevity is beneficial if it is accompanied by a high quality of life.

**Objective:** The goal of this study was to identify factors that would improve the preservation of physical and cognitive function during old age.

**Material and methods:** Centenarians were evaluated as cognitively intact with MMSE or Hasegawa dementia scale. Neuropathological changes related to Alzheimer's disease, Lewy body disease, argyrophilic grain disease, senile dementia of the neurofibrillary tangle type and Binswanger's disease were observed in the autopsied brains from the dementia-free centenarians, indicating the brain reserve. The medical records of ten dementia-free centenarians were available for the analysis of vascular risk profile (i.e. hypertension, diabetes and hypercholesterolemia) and lifestyle aspects (i.e. smoking, alcohol, diet and physical activity).

**Results:** Six dementia-free centenarians had hypertension and two had hypercholesterolemia. None had diabetes mellitus. They were slim (average body mass index of 19.2) and one usually eat until 80% full, a cultural habit "hara hachi bu" in Japan. Only one smoked and drank alcohol. Most remained active (i.e. sumo fan, karaoke singer). One usually read the Bible in English. However, the Activities of Daily Living capabilities were impaired by blindness, deafness and femoral neck fracture.

**Conclusion:** Following a healthy life-style, "Hara hachi bu" and using two languages may increase brain reserve. Protecting eyes, ears, and legs are also important to improve the quality of life during oldest old age.

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WFN15-1335

**Dementia****Evaluation of a brief cognitive screening tool in primary care setting**

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**Background:** Population-based screening has not been demonstrated to improve decision making in dementia. In the Chilean primary care centres, an abbreviated Mini-Mental State Examination of 19 points (MMSE-19) is annually applied by nurses to older people, but its accuracy has not been examined.

**Objective:** Our aim was to evaluate the utility of this tool to detect dementia.

**Methods:** We obtained patient and Institutional Review Board approval. All people evaluated with MMSE-19 by a trained nurse within 6 months in a primary care centre were invited with an informant for a clinical evaluation by two neurologists blinded to

MMSE-19 score, in order to establish the diagnostic of dementia using DSM-IV-TR criteria. Additionally, a complete Mini-Mental State Examination (MMSE-30) was applied.

**Results:** 13 of the 54 people evaluated fulfilled diagnostic criteria for dementia. The sensitivity of MMSE-19 was 53,8% (95% CI; 25.1,80.8) and the specificity was 82,9% (95% CI; 67.9,92.8). In ROC curve analysis the area-under-curve (AUC) was 0,68 (95% CI; 0.53,0.83). MMSE-30 with a 24 cut-off had 84,6% sensitivity (95% CI; 54.6,98.1), 58,5% specificity (95% CI; 42.1,73.7) and the AUC was 0,71 (95% CI, 0.58,0.84). Socio-demographic variables did not influence our results and alternatives cut-off evaluated did not reach the accuracy of clinical evaluation.

**Conclusion:** Our results are in agreement with the last evidence against the use of cognitive screening tools to detect dementia in elderly general population. Timely detection requires better strategies based on a speedy response to the first complaint of memory loss reported by patients or their families.

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WFN15-0310

**Dementia****Diagnostic challenges in primary progressive aphasia**

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Primary Progressive Aphasia (PPA) is a language-based dementia, in which a progressive language decline precedes more global cognitive deterioration. Recently proposed criteria (Gorno-Tempini et al., 2011) outline **language profiles** and specify **neuroimaging correlates** for three variants of PPA (agrammatic, logopenic, and semantic); however, while some patients' profiles reflect the consistency between language findings and neuroimaging, others do not. Frequently, patients with one variant PPA present with either (1) different imaging results but similar language profiles, or (2) very distinct language profiles, but similar neuroimaging findings. This often makes the ultimate diagnosis of a PPA variant subject to a judgment call, which has both clinical and theoretical implications.

A careful assessment of congruence between language findings and neuroimaging results was undertaken through a review of over a 110 charts of patients with consensus diagnosis of either PPA or Alzheimer's disease (due to its similarity to the logopenic variant PPA). Language profiles and results of neuroimaging were examined to (1) establish consistency between imaging and clinical profile in view of the new diagnostic criteria, and (2) determine whether any one of the PPA variants is more prone to incongruence between language and neuroimaging than others.

The analysis helped delineate specific differences between the variants and to establish language features/tests that should be taken into account during the diagnostic process. Means of language scores were compared between groups using ANOVA to establish language tests that are of greatest diagnostic value.

I have obtained Institutional Review Board (IRB) approval for this study.

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WFN15-0957

**Dementia****Clinical characteristics and frequency of dementia syndromes: comparisons in a memory clinic population**

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**Background:** Dementia and particularly Alzheimer's disease is a progressive, irreversible neurodegenerative condition that has been described as a rapidly growing epidemic of modern societies because of its large societal and financial impact.

**Objective:** To investigate the frequency and clinical characteristics of different types of dementia in people reporting memory complaints. Participants were examined at HYGELA Hospital Memory Clinic in Athens from 2011 to 2014.

**Patients and methods:** 2113 people with memory complaints participated in the study. All underwent physical and neurological examinations and were also assessed by experienced neuropsychologists.

**Results:** Participants (median age  $73.43 \pm 7.48$  years) were predominantly women (68.7%). Among female subjects, 43.3% were married and they had  $9.55 \pm 4.44$  years of education. Among males, 84% were married and they had  $11.66 \pm 4.50$  years of education. An increase in admission in the Memory Clinic was observed, from 198 individuals in 2011 to 800 in 2014. 45.1% of the examined people were diagnosed with Dementia, 34.9% with Mild Cognitive Impairment while 20% had no cognitive deficits. In the demented group, 45% had Alzheimer's disease, 25% vascular dementia, 15% mixed dementia, 10% frontotemporal dementia and 5% other forms of dementia.

**Conclusion:** These data contribute to the better understanding of dementia frequency in Greece and underline the increasing demand for specialized Memory Clinics. Dementia subtypes frequency found in the present study is in accordance with that found in other studies as well.

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362

WFN15-1477

Dementia

**Patients with idiopathic normal pressure hydrocephalus improved executive dysfunction after shunt operation**

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**Background:** Idiopathic normal pressure hydrocephalus (iNPH) is a syndrome characterized by cognitive decline, gait disturbance and impairment in bladder control. We evaluate changes in cognitive function before and after medical treatment for patients with iNPH.

**Objective:** To report the changes of frontal dysfunctions.

**Patients and methods:** We have diagnosed clinical inspection using Japanese NPH Grading Scale-revised to them. First of all, patients took mini-mental state test (MMSE) for memory decline, then took frontal assessment battery (FAB) and Behavioural Assessment of the Dysexecutive Syndrome (BADS). Only the cases that improved by tap tests were performed lumboperitoneal (LP) shunt operations. We examined neuropsychological tests once before tap test and same tests in a half year after surgery.

**Results:** Twenty six patients with iNPH were operated. Significant improvement between before and after operation was found in profile scores of FAB ( $9.6 \pm 3.0$  to  $11.2 \pm 2.9$ ) and BADS ( $7.6 \pm 3.8$  to  $9.6 \pm 3.8$ ). At the Conflicting Instructions and Go/No-Go of FAB item showed significant improvement after the operation. And the categorized item of Action Program in BADS was also improved, although no changeable of MMSE score.

**Conclusion:** It was controversial that the executive dysfunction was recovered by LP shunted taking FAB and BADS. The executive dysfunction is related to the prefrontal area. Especially, Go/No-Go and Conflicting Instructions item showed activity in the posterior part of the inferior frontal sulcus. Memory disturbance is not the main affected impairment by iNPH. We think that the obstacle in iNPH is related with frontal lobe functions such as the executive dysfunction.

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363

WFN15-0311

Dementia

**Predictors of admission to long-term care in rural memory clinic patients**

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**Background:** Dementia poses unique caregiving challenges due to its effect on cognition and behavior. Dementia is a strong independent predictor of the need for long-term care (LTC) in both cross-sectional and prospective studies. To postpone or ease transition to LTC, it is helpful to identify specific predictors of institutionalization in patients referred with memory problems.

**Objective:** To identify patient and caregiver factors predicting LTC admission in rural Saskatchewan patients within 2 years of first visit to a memory clinic.

**Patients and methods:** Data collection began in 2004 at the University of Saskatchewan Rural and Remote Memory Clinic. IRB approval was obtained. The dependent variable was admission to LTC within 2 years of first visit. Thirty independent variables included socio-demographic, clinical and functional information collected through patient and caregiver questionnaires and assessments at initial clinic visit. Variables underwent bivariate linear regression analysis. All associated variables then underwent multiple regression analysis.

**Results:** The sample included 222 patients (mean age 71.3; 18% normal; 40.1% Alzheimer's disease, 17.6% Mild Cognitive Impairment; 8.6% Frontotemporal dementia; 5.0% Dementia with Lewy Bodies; 10.8% Other), 49 of whom were admitted to LTC within 2 years. Patient and caregiver age were both significant predictors of LTC in the multivariate model. Patients with lower MMSE and IADL scores were more likely to be admitted. Patients with daily caregiver contact were less likely to be admitted. Caregiver-rated burden was not significantly associated with LTC placement.

**Conclusion:** Institutionalization was predicted by older patient and caregiver age, frequency of caregiver contact, IADL and MMSE scores.

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365

WFN15-0799

Dementia

**Examining the trajectory of social and behavioral changes in left- vs. right- lateralised frontotemporal dementia**

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**Background:** Frontotemporal dementia presents with changes in behavior, language and/or social cognition, depending on the pattern of atrophy. Individuals with left anterior temporal atrophy (left-ATL) show changes in language at presentation, whereas individuals with right anterior temporal atrophy (right-ATL) usually show behavioral change and prosopagnosia.

**Objective:** We aimed to examine baseline and longitudinal changes in face perception, emotion processing and behavior in left-ATL and right-ATL.

**Patients and methods:** 22 left-ATL and 8 right-ATL were assessed annually (minimum 2 assessments) and were compared with 33 Alzheimer's disease patients (AD) and 25 controls. Participants completed

the Addenbrooke's Cognitive Examination (ACE), a Face and Emotion Processing Battery and the Cambridge Behavioral Inventory (CBI).

**Results:** At baseline, all the patients showed impaired general cognition. Right-ATL also showed impaired face perception and emotion recognition, whereas left-ATL showed impaired emotion recognition only. On the CBI, right-ATL had increased abnormal behaviors and reduced motivation compared to AD, whereas left-ATL and AD were rated similarly. Longitudinal analyses revealed that all patients' general cognition declined. In contrast, left-ATL and right-ATL showed faster emotion recognition decline than AD. On the CBI, all patients showed increased abnormal behavior, whereas left-ATL showed greater motivation changes than AD, with disease progression.

**Conclusion:** While left-ATL and right-ATL show divergent profiles at presentation, both phenotypes develop deficits in emotion processing and behavior. These findings highlight the pervasive socio-emotional deficits in frontotemporal dementia, even in patients with an initial language presentation, and provide evidence that, right- and left-ATL devolve into a similar clinical syndrome over time.

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367

WFN15-1202

Dementia

**White matter lesions and plasma homocystein levels have different influence on cognitive performance among non-demented and demented elderly**

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**Introduction:** Vascular brain changes and vascular risk factors including homocystein may be linked to decline in cognitive functioning, although studies focused on their mutual effect on different cognitive functions are still lacking.

**Objective:** The aim was to assess relationships between white matter lesions (WML), plasma homocystein levels and cognitive functions among non-demented and demented elderly.

**Patients and methods:** In total, 110 participants (17 with dementia due to Alzheimer's disease, 30 with amnesic mild cognitive impairment [aMCI], 46 with subjective memory complaints and 17 controls) underwent clinical and comprehensive neuropsychological examination, MRI brain scan and blood collection with plasma homocystein levels assessment. Severity of WML was assessed with Fazekas visual scale. The Spearman's correlation coefficients were calculated to explore the bivariate relationships in the whole sample and separately in each group.

**Results:** There was a mild correlation between homocystein levels and severity of WML in the whole sample ( $\rho = 0.23$ ,  $p = .015$ ), especially in the aMCI group ( $\rho = 0.42$ ,  $p = .022$ ). Further, homocystein levels correlated with verbal ( $\rho \leq -0.34$ ,  $p = .002$ ) and non-verbal ( $\rho \leq -0.25$ ,  $p = .025$ ) memory and executive functions ( $\rho \leq -0.19$ ,  $p = .045$ ), but not with global cognitive functioning, attention/working memory, visuospatial and language functions. Finally, severity of WML correlated with global cognitive functioning ( $\rho \leq -0.31$ ,  $p = .001$ ), executive ( $\rho \leq -0.33$ ,  $p < .001$ ) and language ( $\rho = -0.31$ ,  $p = .001$ ) functions, but not with verbal and non-verbal memory, attention/working memory and visuospatial functions.

**Conclusion:** Although plasma homocystein levels may be associated with severity of WML, each of them independently affects different cognitive functions and may thus serve as independent risk factors for cognitive impairment among elderly.

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368

WFN15-0147

Dementia

**Targeting tau protein stability in alzheimer disease to identify novel therapeutic entry points**

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Alzheimer disease (AD) is the most common neurodegenerative disorder characterized by severe memory dysfunction. AD neuropathology is characterized by synaptic and neuronal degeneration, amyloid plaques, and neurofibrillary tangles (NFTs). Amyloid  $\beta$ -peptide, derived from the amyloid precursor protein (APP) is the major component of the plaques, whereas NFTs are composed of hyperphosphorylated forms of the protein tau. These two accumulating protein products are believed to play critical roles in AD. However, the exact molecular mechanisms by which they cause neurodegeneration remain to be established. Several lines of evidence suggest that, in AD, increased level of tau proteins is directly correlated with disease onset and severity and that reduction of tau levels rescues phenotypes in both tauopathy and APP models. We hypothesized that the identification of the genes and genetic networks that control tau levels will reveal potential therapeutic target for AD. To this end, we have developed a high-throughput screening strategy which integrates parallel cell-based and *Drosophila* genetic screens, to identify therapeutic entry points for AD by screening the whole "druggable genome" to uncover multiple targets, that reduce the levels of tau protein. The cross-species screens and multiple validation steps in cells and *Drosophila* help us identify "high confidence" hits as robust targets that we are currently validating in mouse models of the disease. The rationale for focusing on a broad set of targets stems from the need to gently inhibit 2–4 of them working in independent pathways to avoid the secondary effects resulting from significantly inhibiting one single pathway.

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369

WFN15-0124

Dementia

**iPSCs from alzheimer's disease patients display neuronal differentiation impairment of neural progenitor cells**

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**Background:** Alzheimer's disease (AD) is the most common age-related dementia associated with progressive neuronal loss. However, the cause of the disease is still unknown. Induced pluripotent stem cells (iPSCs) derived from somatic cells of AD patients provide unique opportunities to model the early development of AD.

**Objective:** The objective of this study is to use iPSCs system to determine the molecular mechanisms of neuronal loss in AD.

**Materials and methods:** We used iPSC lines generated from fibroblasts of two familial AD (FAD) patients with autosomal dominant mutations in *presenilin 1* (*PSEN1*) (S169del) or (A246E). We characterized the AD-iPSCs characteristic properties of human pluripotent stem cells and differentiate them into functional neurons.

**Results:** We found abnormally enhanced neuronal differentiation in AD iPSC-derived neural progenitor cells (AD-NPCs), and a reduction in the number of NPCs in AD-NPCs during differentiation. Consistently, we detected a decreased proliferation and an increased

apoptosis in differentiating AD-NPCs. In addition, we identified the same phenotypes when *PSEN1* with the mutation of A246E was introduced into control iPSCs. Furthermore, knockdown of mutated *PSEN1* in AD-NPCs significantly attenuated the premature neuronal differentiation. Our results suggest that *PSEN1* mutation causes reduction in the NPC pool, which might be relevant to the neuronal loss in the brain of AD patients. Additionally, our genome-wide transcript analyses identified differentially expressed genes relevant to neuronal differentiation and cell cycle in differentiating AD-NPCs. **Conclusion:** Collectively, our study uncovers previously unappreciated early NPC dysfunctions in FAD-NPCs and provides new cues to elucidate molecular mechanisms underlying AD development.

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371

WFN15-0797

Dementia

**Divergent complex network patterns of amyloid-b deposition between language and typical alzheimer's presentations**

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**Background:** Despite divergent clinical features and cortical atrophy distribution, current evidence indicates that language and typical presentations of Alzheimer's disease (AD) display comparable regional amyloid burden.

**Objective:** By using a statistical network approach, we aimed to identify divergent complex network patterns of amyloid deposition across AD presentations.

**Methods:** Sixteen typical AD participants and 18 cases with logopenic variant of primary progressive aphasia (lv-PPA) with demonstration of high cortical amyloid burden were selected. All cases conducted a thorough clinical assessment and PiB-PET scan. Statistical network analysis was undergone in each group based on the estimation of sparse partial correlations of amyloid burden between cortical regions. Global and regional network statistical parameters of cortical amyloid burden were explored.

**Results:** Both groups showed equivalent distribution of cortical amyloid burden. Statistical network analysis, however, demonstrated divergent connectivity properties. Whereas AD showed a skewed degree distribution and hubs confined bilaterally in prefrontal lobes, lv-PPA showed a close-to-normal degree distribution and left-lateralised hubs, but scattered across the whole cortical mantle.

**Conclusions:** The network analysis reveals intricate interregional interactions not evident by the direct comparison of amyloid burden. This suggests that regional downstream neurotoxicity peculiarities accounts for phenotypical differences in AD.

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372

WFN15-0765

Dementia

**Homonymous hemianopia in posterior cortical atrophy: an enigma**

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**Background:** In over 50% of Posterior Cortical Atrophy (PCA) cases homonymous hemianopia (HH) is found and often first signals a neurological cause for otherwise unexplained visual symptoms. The basis of the visual field loss is unknown.

**Objective:** To characterize HH in PCA.

**Patients and Methods:** Perimetry using kinetic (Goldmann; GP) and static (Humphrey; HFA) techniques was carried out in fourteen patients with PCA and HH. Direct comparison was performed after adjustment for size and luminance of the target, using paired *t* test in SPSS 21. Progression was quantified by change in mean deviation (MD) in HFA and modified Esterman score (mEGS) in GP and was analysed according to the presence of HH at baseline, on a mixed effect model linear regression in Stata 12.

**Results:** Whilst all cases initially showed partial HH on HFA only 50% showed any VF loss on GP. Visual field loss to static remained greater than kinetic over time. HFA fields degraded at a rate of  $-0.20$  MD/month ( $p = 0.000$ ) and was asymmetric, occurring faster in the initially affected hemifield ( $-0.17$  against  $-0.06$  monthly) but this difference diminished with time. Dissociation between static and kinetic VFs also decreased due to accelerating kinetic loss.

**Conclusion:** HH in PCA has unusual characteristics: it is incomplete, shows stato-kinetic dissociation and is progressive. Its pathophysiological basis is unknown.

\*I have obtained patient and/or Institutional Review Board (IRB) approval, as necessary.

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373

WFN15-1134

Dementia

**A literature review on dementia diagnosis**

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**Introduction:** Dementia is a syndrome characterized by acquired cognitive decline, with a chronic and progressive nature, that compromises several brain functions, including memory, thinking and orientation. There is primary and secondary dementia, and both have increased in importance due to the higher life expectancy.

**Objective:** Analyze the current literature on dementia diagnosis.

**Materials and methods:** A search was performed in SciELO and PubMed using "dementia AND diagnostic". Only texts published in the last 5 years were considered. 7 articles approached the subject of interest.

**Results:** Laboratory and imaging exams are helpful in excluding non-degenerative causes (syphilis, kidney failure, hydrocephalus, compressive factors), and evidencing signs of disease as atrophic limbic system, typical of Alzheimer's disease (AD). But clinical history is still sovereign to evaluate cognitive functions and memory. Degenerative causes are: AD, which is progressive with memory impairment as early symptom; Vascular Dementia (VD), fast evolution, with focal deficits associated with stroke history; Lewy Body Dementia (LBD), there are parkinsonism signs, hallucinations and fluctuations of cognitive deficit; Frontotemporal Dementia (FD), with progressive behavior changes, and later memory impairment. FD and VD happen before 65 years, while AD and LBD are typically more senile. Laboratory tests have low sensitivity and specificity, although Memory Alteration Test have been effective in early diagnose.

**Conclusion:** Despite the existence of laboratory and imaging exams, the diagnosis of dementia is clinical, associated with cognitive

function tests that play an important role in dementia identification, aiming at early diagnosis. Besides, patient follow up is essential for diagnostic confirmation.

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375

WFN15-1309

Dementia

**Anatomical correlations of memory impairment measured by the free and cued selective remanding test verbal and visual versions**

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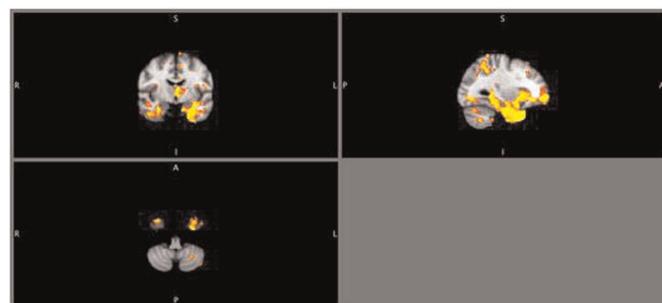
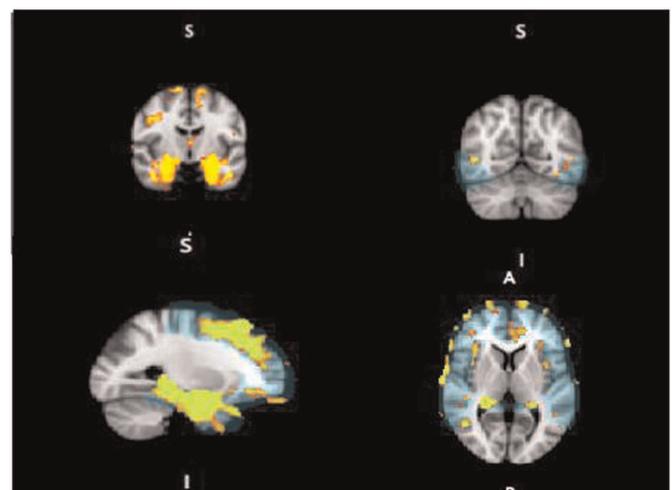
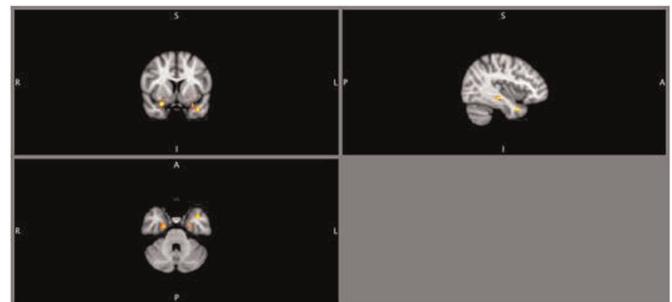
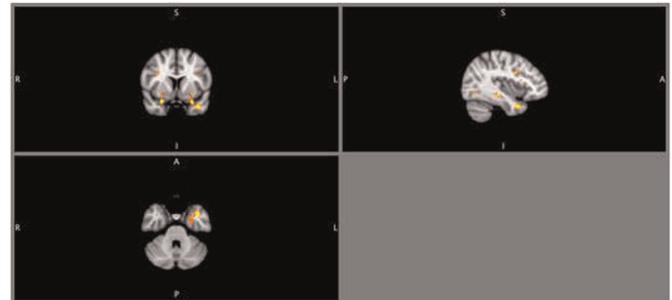
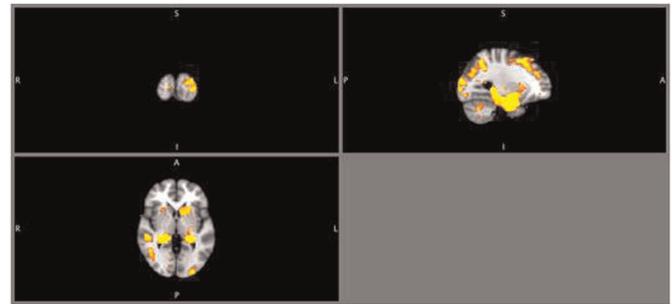
**Background:** Hippocampal atrophy increases the certainty of the diagnosis in Alzheimer's disease (AD). The Free and Cued Selective Remanding Test (FCSRT) has shown to be useful for measuring memory impairment due to hippocampal involvement.

**Objective:** Explore the anatomical correlations of memory impairment measured through the FCSRT Verbal and Visual Versions across a cohort of patients with AD and healthy controls (HC).

**Participants and methods:** 35 patients with AD and 34 HC were assessed with an extensive neuropsychological evaluation. Using a 1.5-Tesla magnetic resonance (MR) scanner, T-1-weighted MR images were obtained for all the participants. Voxel-based morphometry was applied to the brain images using a mask for prefrontal and temporal areas and the respective grey matter atrophies encountered were covaried against different outcomes of both versions of the FCSRT. Ethical approved was appropriately obtained for this study.

**Results:** Table 1 shows the clinical characteristics of the sample. Free and cued recall both versions of the FCSRT covaried with either left, right or bilateral temporal areas including both hippocampi. More details concerning these findings can be seen in Tables 2 and 3 and Fig. 1.

**Conclusion:** Memory impairment was mainly correlated with atrophies in both hippocampi. Performances on the FCSRT and their respective correlations with diverse atrophies varied in accordance with the stimuli used in each version of this tool.



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WFN15-1386

**Dementia****Diabetes mellitus, alzheimer disease and vascular dementia: a clinicopathologic study**

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**Background:** Several epidemiological studies have associated diabetes mellitus (DM) with dementia. However, neuropathological studies examining this relationship are scarce.

**Objectives:** To identify association between DM and dementia, Alzheimer disease (AD) and Vascular Dementia (VaD) in a neuropathological study.

**Methods:** Data were collected from the cases included in the Brain Bank of the Brazilian Aging Brain Study Group between 2004 and 2011. Cases were divided into 2 groups: without DM (G1) and with DM (G2). Clinical diagnosis of dementia was determined by the scores  $\geq 1.0$  in the Clinical Dementia Rating (CDR) and  $\geq 3.42$  in the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE). Immunohistochemistry was used for the neuropathological diagnosis. Mann–Whitney test and multiple linear regression were applied to quantitative variables, and multiple logistic regression and  $\chi^2$  test for categorical ones.

**Results:** Total sample included 829 subjects, divided in G1 = 605 (73%) and G2 = 224 (27%). DM increased the risk for dementia (OR: 1.49, 95% CI: 1.03 to 2.16,  $p = 0.03$ ) and hyaline arteriosclerosis (OR: 1.66, 95% CI: 1, 11 to 2.49,  $p = 0.01$ ) whereas there was no association of DM with neuritic plaques ( $p = 0.76$ ), neurofibrillary tangles ( $p = 0.93$ ) and infarct group ( $p = 0.56$ ) after adjustment for demographic variables and vascular risk factors.

**Conclusion:** DM is a risk factor for dementia probably due to small vessel disease, independently of the neuropathological cause.

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378

WFN15-1065

**Dementia****Chilean health professionals perception of knowledge about dementia**

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**Background:** Worldwide Dementia prevalence is increasing abruptly, especially in Chile. However, we do not know the training that health professionals have to handle this situation.

**Objectives:** Describe the perception of knowledge about dementia management in health professionals.

**Material and methods:** A survey for health professionals in Chile was executed via internet, based on a modified instrument of a study by INECO in Argentina.

**Results:** A total of 799 health professionals answered; 37 % were medical doctors, and 63% were other health professionals. Half of the sample (51%) considered that their knowledge about dementia was inadequate. Although 65% of the professionals had lectures on this subject in University, 81 % consider that it was not sufficient to prepare them to work with this type of patients (table). Only 40% of medical doctors answered that they performed an etiological study

of the type of dementia before start pharmacological treatment, and 42 % referred them to a specialist. The majority of medical doctors did never prescribe symptomatic pharmacological treatment for dementia (53%). However, this situation was more frequent in general practitioners (52%) than in specialist (39 %).

**Conclusion:** Despite of the increasing dementia prevalence, the perception of expertise of Chilean health professionals about the management of dementia patients is very poor.

	Very Prepared	Prepared	Partially prepared	Not prepared at all
General Practitioner	1%	15%	64%	12%
Specialist	12%	28%	37%	15%
Psychologists	4%	9%	55%	32%
Speech Therapists	4%	49%	35%	6%
Occupational Therapists	19%	43%	32%	6%
Nurses	9%	27%	41%	23%

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379

WFN15-0284

**Dementia****Antibodies against glial derived antigens as early biomarkers of hippocampal demyelination and memory loss in alzheimer disease**

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**Background:** Alzheimer disease (AD) is known to exhibit well characterized pathologies including the extracellular accumulation of amyloid plaques, intra-axonal presence of neurofibrillary tangles and glial hypertrophy. Nevertheless the nature of myelin pathology in AD has not been well studied. Recent studies on animal models of AD, revealed however focal demyelination within beta amyloid plaques in hippocampus.

**Aim:** To assess humoral response against proteins of myelin sheath in AD, in hope to find an early biomarkers of memory loss and neuropathological process characteristic for the disease.

**Materials and methods:** We assessed antibodies levels against proteins of myelin sheath: myelin oligodendrocyte glycoprotein (MOG), myelin basic protein (MBP), myelin-associated glycoprotein (MAG), proteolipoprotein (PLP) in sera of 26 AD patients and 26 healthy controls, using commercially available ELISA system (Mediagnost, Germany).

**Results:** In the AD patients subgroup significantly higher titers were observed for all types of assessed IgG autoantibodies compared to healthy control subjects (anti-MOG, anti-MAG, anti-MBP, anti-PLP). For IgM antibodies, among AD patients we observed higher titers for majority of investigated autoantibodies ( $p < 0.05$ ), with exclusion of anti-MAG IgM antibodies ( $p > 0.05$ ).

**Discussion:** The study provides the evidence for the significantly increased production of autoantibodies against proteins of myelin sheath in AD. These results can be of importance in the light of emerging data from animal models of AD, indicating early demyelination of hippocampal region. Further studies on larger population are necessary to confirm whether these autoantibodies could serve as early biomarkers of AD in humans.

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### 380 WFN15-0336

#### Dementia

#### Safety of donepezil in Korean patients with severe Alzheimer's disease

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**Background:** A variety of factors make it difficult to treat severe Alzheimer's disease (AD) patients, including old age, high rates of comorbid conditions, concomitant medications and frail health. However, the results of clinical studies regarding safety of donepezil in severe AD patients are limited in Korea.

**Objective:** To determine the safety of donepezil in severe AD patients and to compare occurrence and frequency of adverse events (AE) between mild to moderate group and severe group.

**Methods:** All patients with mild to severe AD who received at least one dose of donepezil and had one post-dose safety assessment were included in the statistical analysis.

**Results:** A total of 5698 patients were included in safety analysis. AEs were reported in 2.54% (145 of 5698) and adverse drug reactions (ADR) in 1.81% (103 of 5698). The incidence of AE and ADR showed a slightly higher rate in the severe group than mild to moderate group. This is possibly due to higher average age and higher rates of comorbidity, concomitant medications in the severe group compared to the mild to moderate group. Despite this trend, all did not reach statistical significance (AE:  $p = 0.2285$ , ADR:  $p = 0.3458$ ).

**Conclusion:** Donepezil in severe group showed a comparative, equivalent safety profile, compared to mild to moderate group. Thus, no notable concern was observed when donepezil was administered in severe AD patients.

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### 381 WFN15-0583

#### Dementia

#### Clinical usefulness of the geriatric serious games for cognitive impairment

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**Background:** The elderly patients with cognitive dysfunction are increasing rapidly. Because many neuropsychological screening tests are time consuming and so complicated to perform, there are many practical difficulties for screening the patients with cognitive dysfunction. For these reasons, we intended to find out the patients with cognitive dysfunction through a simple, easy and interesting computer games.

**Methods:** We studied total 588 patients (the normal cognitive (control) group: 464 people, cognitive dysfunction (patient) group: 124 patients). We performed neuropsychologic tests, and used the geriatric serious games that are three kinds of computer games ("Catching a fruit" game, "Setting the table" game, "Elevator" game).

**Results:** There is a significant difference in "Setting the table" game scores ( $t = -1.973$ ,  $p < 0.05$ ) and "Elevator" game scores ( $t = -2.777$ ,  $p < 0.01$ ) between patient group and control group. However, there is not a significant difference in "Catching a fruit" game scores and total game scores between patient group and control group. Mini-Mental Status Examination scores are significantly correlated with the game scores of "Setting the table" and the

number of correct answers and also correlated with game scores of "Elevator", the number of correct answers, and ratio of correct answer in both groups.

**Conclusions:** In this study, we can know about a difference between control group and patient group through the games measuring geriatric cognitive function. We conclude that through the simple, easy and interesting computer games, we can screen the patients with cognitive dysfunction, who have difficulties performing the existing neuropsychological screening test.

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### 382 WFN15-0238

#### Dementia

#### Distribution analysis of cerebral microbleeds in Alzheimer's disease and stroke with susceptibility weighted MR imaging

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**Background and objectives:** Cerebral microbleeds (CMBs) are an important finding in cerebral amyloid angiopathy and hypertensive arteriopathy. A few studies showed that these two disorders have different patterns in CMBs distribution on the brain. The aim of this study is determining different patterns in CMBs distribution on the brain in AD and stroke by susceptibility weighted imaging (SWI) which is known to be a sensitive magnetic resonance technique in detecting microbleeds.

**Methods:** Seventy-one patients presenting at our neurology department were included and 1.5 Tesla SWI was used to image. Thirty AD patients and 21 patients who had recent ischemic stroke. Remnant 20 patients was classified with healthy control with subjective memory complaint.

The Microbleed Anatomical Rating Scale (MARS) was used to localize each CMB (lobar versus basal ganglia/thalamus (deep), and infratentorial). Incidence, and numbers of microbleeds in each anatomical division were counted and statistically compared each other.

**Results:** Total CMBs were revealed a preference for the lobar and basal ganglia/thalamus (deep) regions. There was a statistical significance that CMBs in patients with AD had higher incidence of CMBs in lobar region and showed predominant distribution of CMBs in lobar brain area than infratentorial region significantly ( $p = 0.019$ ). In stroke patients, had higher incidence of CMBs in basal ganglia/thalamus (deep) region and showed significant predominance in basal ganglia/thalamus (deep) region than infratentorial region ( $p = 0.033$ ). And there were statistical significance for predominant distribution of CMBs in ganglia/thalamus (deep) region in stroke patients compared with AD ( $p = 0.037$ ) and controls ( $p = 0.011$ ). But there is no statistically significant difference of distribution predominance between AD and controls.

**Conclusion:** Enhanced detection and localization of CMBs through SWI might provide a useful differential diagnosis tool for cerebrovascular and cerebral degenerative disorders.

**Keywords:** cerebral microbleeds, SWI, Alzheimer's disease, stroke

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### 383 WFN15-0181

#### Dementia

#### Comparison of APACHE II and SAPS II between hemorrhagic and ischemic stroke patients

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**Background:** Stroke is the second most common cause of death worldwide and the most frequent cause of permanent disability. While mortality of stroke patients has markedly decreased in most countries with the introduction of intensified treatment protocols and advanced supportive medical therapy, mortality is still high in patients requiring intensive care treatment.<sup>1</sup>

**Materials & methods:** We studied the applicability of APACHE II and SAPS II in patients admitted to the intensive care unit (ICU) with acute cerebral stroke and compared the results with the GCS. We also conducted a comparative study regarding the accuracy of predicting hemorrhagic and ischemic strokes mortality. Between January 2011 and December 2012, ischemic or hemorrhagic stroke patients who were admitted to the ICU were included in the study. APACHE II- and SAPS II-predicted mortalities were compared by a calibration curve, the Lemeshow-Hosmer goodness for fit test, and the receiver operating characteristic (ROC) curve, and the results were compared with the GCS and NIHSS

**Results:** 498 patients were included in this study. The observed mortality was 26.3%, whereas APACHE II- and SAPS II-predicted mortalities were 35.12% and 35.34%, respectively. The mean GCS and NIHSS scores were 9.43 and 21.63, respectively. The calibration curve was close to the line of perfect prediction. The ROC curve showed a slightly better prediction of mortality for APACHE II in hemorrhagic stroke patients and SAPS II in ischemic stroke patients. The GCS and NIHSS were inferior in predicting mortality in both patient groups.

**Conclusions:** Although the APACHE II and SAPS II systems can be used to measure performance in the neurosurgical ICU setting, the accuracy of APACHE II in hemorrhagic stroke patients and SAPS II in ischemic stroke patients was superior

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WFN15-1400

Dementia

**Contrasting longitudinal changes in cognition in alzheimer's disease and behavioural-variant frontotemporal dementia**

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**Background:** Executive dysfunction with relative sparing of episodic memory defines the cognitive profile of the behavioural variant of frontotemporal dementia (bv-FTD). Clinical differentiation between bv-FTD and Alzheimer's disease (AD) remains, however, difficult since executive dysfunctions are common in AD, and bv-FTD can present with marked episodic memory deficits. This contention, however, is based on cross-sectional studies.

**Objective:** To contrast longitudinal changes in cognition between individuals diagnosed with AD or bvFTD, focusing on executive function and episodic memory, as little is known about the progression of these cognitive deficits over time

**Patients and methods:** Using mixed-model regressions, we investigated the trajectory of performances on general cognition, memory, executive tasks and functional scales over a mean follow-up of 2 years in 22 probable bv-FTD and 31 typical AD patients.

**Results:** Bv-FTD experienced a faster functional deterioration and, despite equivalent baseline performance, a steeper decline in global

cognition than AD. At baseline, both groups were significantly impaired on executive function and memory tasks compared to controls, but these deficits were more marked in the bv-FTD group. Bv-FTD showed significantly larger annualised decline than AD on the ACE-R memory domain ( $-2.9$  vs  $-1.3$  z score) and digit span forwards ( $-0.4$  vs  $-0.1$  z score).

**Conclusion:** Despite the different magnitude of deficits, these findings suggest that neither the initial neuropsychological assessment nor projected performances reliably distinguishes the totality of bv-FTD and AD individuals. Additional tasks that measure social cognition may be useful complements to assist with the differential diagnosis between these two dementia syndromes.

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WFN15-0146

Dementia

**Neuroprotection: divalproex sodium-NMR studies-s**

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**Background:** A study in the last 20 years with acute and chronic psychotic patients using MRI-S. We found a decrease in NAA (N-acetyl aspartate) in these clinical entities. The NAA is a metabolite osmoregulator functional life indicator of neuronal bodies and axons. Other metabolites are investigated: Cr Cho, Ins, GLX and Lactated showing changes that can be correlated with each other.

**Objectives:** To verify neuroprotective effect in a study with patients receiving atypical antipsychotics with or without additional medication divalproex sodium (DVA), and the differences obtained in patients with first or recurrent crises. The spectral marker used was the NAA.

**Material and methods:** Patients from the Regional Hospital of IESS Guayaquil (Department of Psychiatry) and Braintronic Institute. Examined 45 patients aged 20–50 years; 35 male and 10 female on a 12-month treatment, and levels of NAA at the beginning and end of treatment compared.

**Results:** Patients first crisis obtained a 80% clinical recovery being also correlated with an increase of spectral NAA. Patients who received atypical antipsychotics OLZ - RISP with DVA, showed a spectral greater improvement compared to those who received only atypical drugs. Patients whose levels remained low NAA did not obtain sufficient clinical recovery. These findings postulate that common psychotic symptoms in psychiatry have a neurodegenerative nature.

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WFN15-1515

Dementia

**PARP-1 activation and interleukin expression in mild cognitive impairment**

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**Introduction:** Mild cognitive impairment (MCI) is a clinical entity defined as a decline in cognitive functioning evidenced by clinical

evaluation, in the absence of major repercussions on daily life. Its importance is the fact that 1 in 3 patients that suffer MCI develop Alzheimer's disease (AD) annually. There is evidence that inflammation mediated by interleukins may have a role in the pathogenesis of AD. In addition, an activation of Poly [ADP-ribose] polymerase 1 (PARP-1) has been reported in various disease models, and that its activation influences the expression of proinflammatory cytokines. Our group has already shown that PARP-1 is overexpressed in patients with AD. The mechanisms involved in amnesic MCI (aMCI) related to interleukin and PARP-1-dependent inflammation are yet to be investigated.

**Objective:** Measure PARP-1 and interleukin levels in LPS-stimulated and non-stimulated lymphocytes from patients with aMCI, non-amnesic MCI, and healthy age-matched controls.

**Materials and methods:** Lymphocytes from patients with aMCI, non-aMCI, and controls diagnosed by Clinical Dementia Rating (CDR), Montreal Cognitive assessment (MoCA) and neuropsychological evaluations were stimulated with LPS and PARP-1 and interleukin mRNA were measured by real time PCR.

**Results:** Lymphocytes from patients with aMCI showed increased PARP-1 expression as previously observed in lymphocytes from AD patients. Analysis of interleukin expression when stimulated with LPS is still in progress.

**Discussion:** These results show that PARP-1 expression in lymphocytes is increased in patients with aMCI and AD, suggesting a role of systemic inflammation and circulating factors in the pathogenesis of early AD. Fondecyt 1151297 (MIB), 3140273 (CSM).

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WFN15-0138

Dementia

**Human prion diseases in Japan: a prospective surveillance from 1999**

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**Background:** A nationwide surveillance system for human prion diseases (PrDs) was established in April 1999.

**Objective:** The aim of this study is to describe the features of epidemiology, clinical manifestations of human PrDs in Japan until September 2014.

**Patients and methods:** We collected information on clinical, neuropathological, and molecular genetic data of patients suspected as having PrDs and analyzed by the CJD Surveillance Committee, Japan, from April 1999 to September 2014.

**Results:** We have obtained the information of 4,749 patients. A total of 2,394 cases of PrDs was identified, including 1,836 cases of sporadic CJD (76.7%), 365 of genetic CJD (15.2%), 95 of GSS (4.0%), 4 of FFI (0.2%), 85 of dura mater graft-associated CJD (dCJD) (3.6%), 1 of variant CJD (0.04%), and 7 of unclassified CJD. The overall annual incidence rate was 1.2 cases per million person-year. Genetic analysis was performed in 1,718 patients, and revealed that 459 cases had mutations in *PRNP* gene. The most frequent was 211 cases of V180I

mutation, followed by 76 cases of P102L, 63 of M232R, 61 of E200K, 6 of P105L, 5 of D178N, and 3 of insertion mutations. Autopsy was performed 16% of total 1,846 patients who had died. Of total 148 dCJD cases in Japan, 85 cases were identified during this surveillance period.

**Conclusion:** Human prion diseases in Japan are characterized by frequent occurrence of dCJD and many patients with genetic prion diseases which are unique to Japan and uncommon in other countries.

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WFN15-1412

Dementia

**Correction of vitamin d status improves lymphocyte susceptibility to oxidative cell death in mild cognitive impairment patients**

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**Background:** Mild cognitive impairment (MCI) is defined as the deterioration of one or more cognitive skills, without dementia. MCI has an annual conversion rate to Alzheimer disease (AD) of 10–30%. Alterations of some metabolic factors, such as deficiency of vitamins D, are a risk factor for the development of MCI. We have previously reported that lymphocytes from AD patients have an increased susceptibility to oxidative death by H<sub>2</sub>O<sub>2</sub> exposure, making lymphocyte death a potential biomarker of the clinical course of MCI.

**Objective:** Determine if the correction of vitamin D levels improves the cognitive status and the susceptibility to oxidative cell death of lymphocytes.

**Patients and methods:** Lymphocytes from 13 MCI patient (CDR = 0.5, Clinical Dementia Rating and Montreal Cognitive assessment, Moca) and 14 control (CDR = 0) were treated with H<sub>2</sub>O<sub>2</sub> for 20 h. Cellular death was determined by flow cytometry. Patients with low levels of vitamin D.

**Results:** Lymphocytes from MCI patients have an increased susceptibility to oxidative death. This susceptibility was decreased after 6 month of vitamin D supplementation.

**Conclusion:** We propose the possibility that lymphocyte death might be an economic MCI and minimally invasive biomarker, useful for the evaluation of cognitive deterioration.

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WFN15-1103

Dementia

**Routine measures and alzheimers disease biomarkers in CSF as potential prognostic indicators in diagnostically unresolved patients referred for dementiae evaluation**

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**Introduction:** Patients referred for cognitive evaluation may even after an extensive diagnostic workup including CerebroSpinal Fluid (CSF) examination, still remain diagnostically unresolved. However distinction between cognitive impairment due to neurodegenerative versus non-degenerative disorders is of great importance for prognosis.

Neuroinflammatory markers and AD CSF biomarkers, are related to the neuropathological features of AD and are diagnostically helpful, but also relevant as predictors of clinical progression in Mild Cognitive Impairment (MCI)/prodromal AD. Elevated T-tau concentration may predict clinical progression, regardless of the underlying condition.

**Methods:** Data were retrospectively collected from 353 consecutively referred patients, of which 61 were diagnosed with MCI, 83 were diagnostically unresolved, and 175 had AD. The cohort also included a healthy control group (n = 34). Lumbar puncture was part of the diagnostic work-up at baseline, and routine CSF-parameters, CSF-biomarkers and IgG index were measured. Patients were clinically followed and progression was determined by an experienced physician.

**Results:** Overall significant difference for P-Tau and T-Tau between groups was found. A significant lower T-tau concentration was found in diagnostically unresolved compared to AD respectively MCI groups. Likewise a significant difference in P-tau concentration between AD and diagnostically unresolved groups was found, with a higher P-Tau concentration in AD group. No significant difference was seen in CSF protein concentration between groups.

**Conclusion:** In this study of CSF parameters as potential prognostic indicators in diagnostically unresolved patients, we found a significant difference in AD CSF biomarkers between groups. Further statistical analysis is ongoing.

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WFN15-1298

Dementia

**Functional correlates of the technology-activities of daily living questionnaire in alzheimer's diseases**

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Information and communication technology (ICT) has become an increasingly important part of daily life. The Technology-Activities of Daily Living Questionnaire (T-ADLQ): is a novel functional assessment scale that incorporates an ICT-related subscale. The assessment of functionality is an essential item in the diagnosis of dementia due to Alzheimer's Disease (AD). There is limited research about AD-related neural change leading to decreased independence. There is no study on the neural correlates of the T-ADLQ in AD.

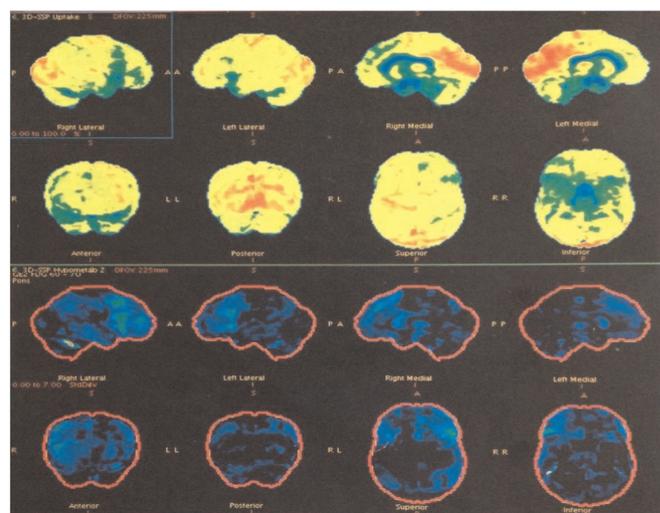
**Objective:** Explore the neural correlates of T-ADL in patients with AD in comparison to healthy control (HC).

**Patients and methods:** MR images were obtained with a 1.5-Tesla magnetic resonance scanner, T-1-weighted. The T-ADLQ were covaried against gray matter atrophy regions via Voxel-based morphometry in AD (n = 33) and contrasted against Healthy Controls (n = 29). The study was approved by the Ethical and Scientific Committee-SSMO.

**Results:** The T-ADLQ, controlled for age and education level, correlated with prefrontal, inferior and medial temporal lobe, as well as occipital brain regions in particular, indicating the importance of those regions in performing ADL type activities.

**Conclusion:** Our study suggests that widespread atrophy of the prefrontal, temporal and occipital brain regions is significantly associated with functional impairment. These findings further corroborate the notion that functional impairments are very sensitive to neurodegenerative processes, as they require intactness of multiple brain regions.

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WFN15-0833

Dementia

**Occupational selfdirection and cognitive performance in older adults, preliminary results**

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**Background:** Cognitive reserve theory emphasizes that people process information in different ways depending on the tasks performed. Different environmental stimuli may provide varying degrees of protection against neurodegenerative diseases in the elderly.

**Objective:** To analyze the association between self-direction of main lifetime occupation and cognitive performance in elderly population.

**Material and methods:** 112 senescent that reside in Buenos Aires' city were assessed. A descriptive-correlational design of cross section was used. Assessment Battery: Occupational Selfdirection Questionnaire, Vocabulary, Analogies, Cubes, Matrix reasoning, Digits WAISIII, Logic Memory Signoret, CVLT, Boston Naming Test, Fluencies, TMTA-B.

**Results:** The statistical processing applied indicates positive correlations between the level of overall complexity, lifetime occupation and cognitive performance: Analogies ( $r = .43$ ,  $p < .05$ ), Vocabulary ( $r = .54$ ,  $p < .05$ ), and Fonological fluency ( $r = .23$ ,  $p < .01$ ), Cubes ( $r = .34$ ,  $p < .01$ ), TMTB ( $r = .38$ ,  $p < .01$ ), Global IQ ( $r = .50$ ,  $p < .01$ ), Verbal IQ ( $r = .52$ ,  $p < .01$ ) and Executive IQ ( $r = .34$ ,  $p < .01$ ). Positive associations were observed between the degree of novelty-routine of main lifetime job and cognitive performance: Analogies ( $r = .26$ ,  $p < .05$ ), Vocabulary ( $r = .39$ ,  $p < .05$ ), Cubes ( $r = .21$ ,  $p < .05$ ), TMTB ( $r = .31$ ,  $p < .01$ ), Global IQ ( $r = .34$ ,  $p < .01$ ) and Verbal IQ ( $r = .37$ ,  $p < .01$ ).

**Conclusion:** It can be concluded that more complex and less routine activities could be associated with better performance in some cognitive areas that constitute the subject's cognitive reserve.

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WFN15-1306

Dementia

**Rapidly progressive dementia in a neurologic unit of a tertiary hospital in Brazil**

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**Background:** Rapidly progressive dementia (RPD) was considered rare and most of the studies have focused on prion diseases. However, advances in immune-mediated disorders have allowed the diagnosis of previously unrecognized treatable dementias.

**Objective:** To describe the prevalence and causes of RPD in a neurology unit of a tertiary hospital and which are potentially reversible.

**Patients and methods:** This study is a cross-sectional evaluation of all inpatients in a neurologic unit of a tertiary hospital in Brazil from March 2012 to February 2015. The inclusion criteria were patients who progressed to severe dementia in up to two years before hospitalization.

**Results:** We identified 1,648 patients and 75 cases RDP were found (4.5%) with a mean age of 48 years. Median time to progression was 6.3 months. The main diagnoses were immune-mediated encephalopathies (25.3%), herpes virus encephalopathies (13.3%) and Creutzfeldt-Jakob disease (10.6%). If we include vasculitis, sarcoidosis, Behçet, paraneoplastic and corticoid-responsive encephalopathies as immune-mediated conditions, they had been responsible for 49.3%. Cases of antibody-mediated encephalopathies were distributed into 10 patients with anti-NMDA and one of following: anti-GAD, anti-LGI1 and anti-GABAA, anti-Glicine and unknown antibody. Outcome of RPD cases was 64% partial or great improvement and 31% no improvement. If only patients aged over 50 years and exclude acute cases, immune-mediated disorders were responsible for 11 (35.4%) of the RPD and six were DCJ.

**Conclusion:** Immune-mediated diseases were the most common cause in our center. The identification of some treatable causes reinforces the importance of rapid evaluation of RPD to initiate specific therapy.

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WFN15-0185

Dementia

**The clinical efficacy of N-Methyl D-Aspartate receptor antagonist for parkinson's disease dementia: brain perfusion spect study**

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**Background:** Memantine's efficacy has been demonstrated in patients with moderate to severe Alzheimer's disease (AD). However, memantine therapy is not typically used in treating Parkinson's disease dementia (PDD), although the deviating glutamatergic pattern evidenced in neuropathological findings suggests that NMDA receptor antagonists in patients with Lewy body disorder may be effective. Therefore, we conducted this longitudinal study to confirm the efficacy of memantine for PDD by analyzing comparative changes in regional cerebral blood flow (rCBF) and neuropsychological tests before and after memantine administration in PDD.

**Methods:** A total of 18 patients with PDD were enrolled in this study. All patients underwent Tc-99m HMPAO SPECT and completed neuropsychological tests before and 12 months after memantine administration.

**Results:** This study showed that there was no significant difference in cognitive functioning before and after memantine administration. No significant difference in rCBF was observed in any regions at baseline compared to 12 months after memantine administration.

**Conclusion:** Our results suggest that memantine delays the speed of deterioration in cognitive functioning and behavioral symptoms in PDD because we found no significant changes in rCBF and cognition after memantine treatment.

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WFN15-1046

Dementia

**Burden of alzheimer type dementia on caregivers**

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The aim of this study was to evaluate the burden on caregivers of patients with Alzheimer's dementia. Fifty patients whose age are over 50 with Alzheimer's type dementia and their relative 50 attendants as caretakers, a total 100 individual is included in the study. Standardized Mini-mental test, Geriatric depression scale, Katz daily life activities index, Lawton and Brody instrumental daily life activities and in order to staging clinic staging scale are applied to the patient group. Beck depression scale and Zarit burden scale are applied to patients' relatives. Groups of patients and their relatives are compared according to scale score calculations. When groups are compared, a statistically significant relationship is detected between Zarit burden scale scores and daily life activities/instruments. Zarit burden score and depression score are increased as clinical stage becomes intensified in patients. While there is a relevance between clinical stage and caretaker burden, a statistically advanced relevance exists with depression. The more increased depression score, the more burden the caretakers have. There exists an advanced relation between zarit score and depression scores. As daily life activities / instrumental daily life activities in patients declines, depression ratio seen on caretakers increases. This study has shown that there is a significant correlation between burnout and depression levels of

patients' relatives as caretakers as dementia stage advances and intensification of depressive compliances increases.

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WFN15-1051

Dementia

Prevalence of dementia one year after stroke

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The aim of this study was to determine the prevalence of dementia after stroke and its possible clinical and sociodemographic risk factors, one year after the index stroke episode. Eighty seven stroke cases were included in this study one year after the index episode as they fulfilled the inclusion criteria. All patients received a detailed systemic and neurological examination and underwent a clinical interview for determining sociodemographic features and vascular and non-vascular risk factors of stroke. Routine laboratory examinations and cranial imaging have also been conducted. Clinical, functional and cognitive status of patients were evaluated at the time of hospitalization and one year later via NIH stroke scale, Barthel index and Mini Mental State Examination (MMSE) respectively. Of 87 patients, 26 (29.8%) were diagnosed as dementia after stroke. Multivariate analyses revealed that increased age, presence of atrial fibrillation, sex and functional status of patients at the time of hospitalization significantly predict the development of stroke in this group of patients. This study has shown that stroke is an important complication of stroke patients even after one year.

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Dementia

Primer progressive aphasia: a case report

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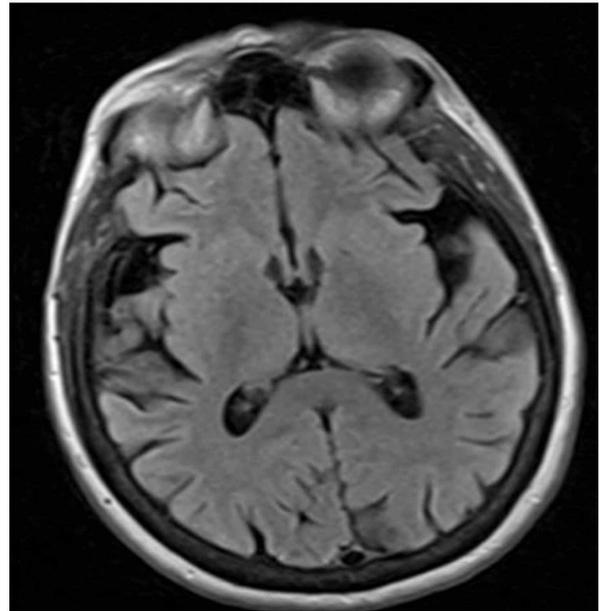
**Background:** Primary progressive aphasia (PPA) is known as subtype of frontotemporal dementia with evident language impairment. There is a progressive disorder in finding and understanding words at least for two years. Mental functions like memory, visuospatial functions, personality traits are generally preserved.

**Objective:** We want to share a quite rare case, PPA by reporting a woman having difficulty in recognizing words and uttering long sentences.

**Patient and methods:** A 65-year-old-woman was admitted to the hospital with complaints with difficult in speaking and fixing long sentences. She stated that she had gathered the sentences in her mind but was not able to find suitable words to express them. On the neurological examination, she could easily transfer her thoughts to writing as well as she could read long sentences, but there were pauses during her speech while using long sentences. She had difficulties in finding the right words to express her thoughts. Insight, judgement, personal care were preserved. In neuropsychological testing, the range of attention was slightly deteriorated and the complex attention was clearly deteriorated.

**Results:** On brain MRI, there were atrophic changes in the perisylvian regions bilaterally. In brain PET hypoperfusion was observed particularly in the left temporal and frontal lobes. She was given donepezil and escitalopram treatment for 6 months and there were no changes on control examination.

**Conclusion:** PPA may not be diagnosed for many years due to the insidious progressive loss of language functions. Neuropsychological testing and neuroimaging is important to diagnose. PPA seemed worth presenting since it was a rare case.



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Dementia

Dysfunction of dorsal visual pathway in myotonic dystrophy type 1

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The patient with myotonic dystrophy (MyD) type 1 is known to be often accompanied by a higher brain function disorder, and there are some reports showing visual cognitive impairment or frontal lobe dysfunction found in MyD. In this study, the patients with MyD type 1 of our hospital were investigated, using cognitive test batteries; Alzheimer's disease assessment scale-cognitive component-Japanese version (ADAS-jcog), frontal assessment battery (FAB), self-motivation score and self-rating depression scale (SDS), visual cognitive function. Single photon emission computed tomography (SPECT) with <sup>123</sup>I-iodoamphetamine (IMP) was examined in the same patients. Total points of each cognitive battery was not correlated each other. In the test battery of visual cognitive function, the ability of the recognition of the slope of a line segment and identify of objects from complicated figures, and the copying ability of the 3-D figures, especially, in transmission images, were decreased. In these patients the <sup>123</sup>I-IMP

SPECT showed marked hypoperfusion in the parietal association area. These results suggest an impairment of spatial orientation caused by dysfunction of dorsal pathway of visual processing.

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Dementia

**The therapeutic effect of rho kinase inhibitor fasudil in APP/PS1 transgenic mice**

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**Background:** The current treatments are unable to prevent or reverse the disease progression in Alzheimer's disease (AD). The novel therapeutic strategy for multiple aspects of AD that attenuates the A $\beta$  burden and Tau phosphorylation and/or converts beneficial microglia polarization could therefore represent attractive targets for AD prevention or therapy.

**Objective:** Based on multi-aspect potential of Rho kinase (ROCK) inhibitor Fasudil on neuroprotection, neurorepair and immunomodulation, in this study, we further observe therapeutic potential of Fasudil in AD of APP/PS1 transgenic mice and explore possible mechanisms.

**Methods:** Male transgenic APP/PS1 mice were treated with Fasudil or saline for 2 months by intraperitoneal injection. The study was approved by the Ethics Committee of Shanxi Datong University. The effects of Fasudil on the impairment of behavioral performance were evaluated by the Morris water maze test.

**Results:** Fasudil treatment ameliorated learning and memory deficits, accompanied by the improvement of A $\beta$  deposition and Tau phosphorylation, the decrease of BACE and the increase of PSD-95 in cortex and hippocampus. Fasudil intervention inhibited the expression of TLR-4, p-NF-kB/p65 and production of IL-1 $\beta$ , IL-6 and TNF- $\alpha$ , which may be related to the shift of microglia phenotype from M1 to M2.

**Conclusions:** Fasudil exhibited multi-target therapeutic effect in APP/PS1 transgenic mice, and presents possible mechanisms, but exact action point still need to be further investigated in different models. (Grant: National NSF of China, 81272163 and 81471412; Research Project Supported by Datong Municipal Science and Technology Bureau, 2014105-1; Shanxi Scholarship Council of China, 2014-00023).

**Keywords:** AD, ROCK, Fasudil

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