

Young Investigators Abstracts

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Hybridtagung



Österreichische Alzheimer Gesellschaft

C9ORF72 repeat length might influence clinical sub-phenotypes in dementia patients

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INTRODUCTION: *C9ORF72* repeat expansions have been observed in a wide variety of neurodegenerative disorders. The cut-off between normal and pathogenic alleles is not well established, as repeat sizing methods are often semi-quantitative. However, intermediate alleles might influence disease prevalence and phenotype, as seen for other repeat expansion disorders. We aimed to further delineate the prevalence of small, intermediate and expanded *C9ORF72* alleles and elucidate their potential influence on the disease phenotype.

METHODS: DNA derived from patients (n=1804) and healthy individuals (n=643) was obtained from the Department of Neurology of the Medical University of Vienna (n=1644), the FTLA registry in Linz (n=139), the PRODEM (n=510) and the VITA cohorts (n=154). Genotyping was performed using a two-step PCR assay followed by Southern blotting.

RESULTS: In our cohort, 3.4% of clinically diagnosed FTD cases and 0.8% of clinically diagnosed Alzheimer's disease (AD) cases were carriers of a pathological *C9ORF72* repeat expansion. A significantly earlier disease onset was detected in *C9ORF72* repeat expansion carriers compared to non-carriers in the FTD (median 50 years, range 39-64 vs. median 64 years, range 36-92, $p=0.018$) and in the AD (median 63 years, range 54-71 vs. median 74 years, range 45-92, $p=0.006$) cohort. Expansion carriers accounted for 3.4% of total early onset AD (EOAD) cases. *C9ORF72* intermediate alleles were significantly associated with cerebellar symptoms ($p=0.0004$) and sensory deficits in the dementia cohort ($p=0.01$).

CONCLUSION: *C9ORF72* repeat expansions occur in a remarkably high proportion of patients with clinically early onset FTD and AD. Furthermore, our results suggest that *C9ORF72* intermediate repeats might modify the phenotypic expression in dementia. As some of the AD patients may represent FTD with an atypical, AD-like phenotype, or even a mixed AD/FTD pathology, post-mortem studies are needed to verify these findings.

Effects of Vortioxetine in Mild Cognitive Impairment Measured by Functional Magnetic Imaging – A Clinical Trial

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Introduction: Mild cognitive impairment is a syndrome characterized by memory impairment beyond that expected for age and education. It is an intermediate stage between subjective cognitive decline and Alzheimer's disease, where deficits can be detected in the ability to learn new information or recall stored information. (1) Neuropathological and neuroimaging studies have consistently found evidence for an early degeneration of the serotonergic neurotransmitter system in AD, making it an interesting target for prevention and early treatment of MCI patients. (2-4) Furthermore, there is evidence that MCI is accompanied by alterations in resting-state functional connectivity that can be detected by fMRI at an early stage of the disease. (5)

In particular, the antidepressant vortioxetine shows improvements of the cognitive

function in patients with major depressive disorder in several studies, which might render this drug an interesting study candidate for symptomatic treatment in MCI. (6-9)

Objective: We propose to measure the effects of vortioxetine on brain functional connectivity with fMRI in a sample of MCI patients.

Methods: In this single-center, randomized, double-blind, placebo-controlled clinical trial we will examine the effects of vortioxetine 10mg or 20mg or placebo in a group of 45 MCI patients over 12 weeks. Neuroimaging with fMRI will be carried out three times in all study subjects at weeks 0, 4 and 12. The clinical trial will include patients suffering from MCI between 50 and 80 years with MCI according to the Petersen criteria (Petersen et al., 1997). Patients with a DSM-5-axis disorder or significant physical illness will be excluded.

As the role of vortioxetine as a possible treatment of MCI has rarely been investigated before, this trial will provide preliminary clinical data for this interesting compound. Furthermore, we will be able to study treatment-associated changes of brain functioning with fMRI.

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Einfluss der Corona-SARS-2-Pandemie auf Menschen mit Demenz und deren Betreuungsumfeld – Eine Fragebogenerhebung der Gedächtnissprechstunde Psychiatrie Innsbruck

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Einleitung: Die Covid-19 Pandemie beeinflusst das Leben älterer Menschen stark, wobei diese neben erhöhten physischen auch psychischen Risiken ausgesetzt sind. Insbesondere Menschen mit Demenz gehören einerseits durch die hohe COVID-19 bedingte Mortalität, aber auch durch Maßnahmen wie soziale Isolation zu einer besonders vulnerablen Gruppe. In dieser Querschnittserhebung sollten Folgen der COVID-19 Pandemie auf unterschiedlichen Ebenen untersucht werden.

Methodik: Querschnittserhebung mittels Fragebogen im Zeitraum zwischen 22. März 2020 bis 28. Jänner 2021 an der Gedächtnissprechstunde der Psychiatrie Innsbruck. Alle PatientInnen und BetreuerInnen/Angehörige wurden im Rahmen der ambulanten Untersuchung befragt. Im Fragebogen wurden Belastungen bedingt durch die COVID-19 Pandemie auf unterschiedlichen Ebenen (z.B. Versorgung, Kognition, Emotion) anhand einer Likert-Skala erhoben.

Ergebnisse: Insgesamt wurde im Erhebungszeitraum 195 Fragebögen für die Datenanalyse herangezogen – 165 der Fragebögen wurden von PatientInnen und BetreuerInnen/Angehörigen ausgefüllt. Die PatientInnen (66% weiblich) waren zwischen 56-95 Jahr alt (77.61 ± 8.1). Bei 85.1% lag eine kognitive Störung vor (55.9% dementielle Erkrankung, 29.2% Mild Cognitive Impairment-MCI). Die explorative Datenauswertung ergab unterschiedlich pandemiebedingte Einschränkungen in sozialen, kognitiven, religiösen und Versorgungsbereichen. Es zeigte sich deutlich, dass eine hohe emotionale Belastung auch mit stärkeren Veränderungen im Versorgungsbereich in Verbindung stand (Selbstbeurteilung: $r = .30$, $p < .001$; Fremdbeurteilung: $r = .46$, $p < .001$). Die emotionale Belastung war außerdem mit stärkerem kognitiven Abbau und einem höher belasteten Betreuungsumfeld assoziiert (Selbstbeurteilung: $r = .41$ bzw. $r = .43$, $p < .001$; Fremdbeurteilung $r = .64$ bzw. $r = .39$, $p < .001$). Alleinlebende Personen und Menschen mit Demenz waren stärker von den Konsequenzen der Pandemie betroffen.

Diskussion: In der vorliegenden Studie zeigten etwa 60% der PatientInnen mit MCI oder einer dementiellen Erkrankung eine teilweise oder häufig Belastung durch die COVID-19 Pandemie. Besonders auf emotionaler Ebene war eine hohe Belastung mit kognitivem Abbau und Angehörigenbelastung assoziiert. Die vorgestellten Ergebnisse heben die weitreichenden negativen Folgen der COVID-Pandemie und verbundenen Maßnahme auf Menschen mit MCI und Demenz hervor.

Promising diagnostic accuracy of plasma GFAP and NfL within the AD continuum: a cross-sectional study

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Introduction: Blood-based biomarkers may add a great benefit in detecting the earliest neuropathological changes in patients with Alzheimer's disease (AD). We examined the utility of neurofilament light chain (NfL) and glial fibrillary acidic protein (GFAP) in plasma and cerebrospinal fluid (CSF) regarding clinical diagnosis and amyloid positivity in an outpatient memory clinic - based cohort.

Methods: In this retrospective analysis, we included a total of 185 patients, 141 patients along clinical the AD continuum, i.e. subjective cognitive decline (SCD, n=18), mild cognitive impairment (MCI, n=63), AD (n=60) and 44 age-matched healthy controls (HC). CSF and plasma concentrations of NfL and GFAP were measured with single molecule array (SIMOA®) technology using the Neurology 2-Plex B kit from Quanterix. Amyloid-PET was performed in 75 patients and graded as amyloid positive and negative by visual rating. To assess the discriminatory potential of different biomarkers, age- and sex-adjusted receiver operating characteristic (ROC) curves were calculated and the area under the curve (AUC) of each model was compared using DeLong's test for correlated AUC curves.

Results: We constructed a panel combining plasma NfL and GFAP with known AD risk factors (age+sex+APOE4+GFAP+NfL panel). Using this panel, AUC was 91.6% for HC vs. AD, 81.7% for HC vs. MCI, 85% for SCD vs. AD, 81.3% for SCD vs. MCI, 77.7% for HC vs. SCD and 72.3% for MCI vs. AD. In terms of predicting amyloid PET status, we computed an AUC of 88.4%.

Conclusion: The combination of plasma GFAP and NfL with well-established risk factors could contribute crucially to the identification of patients at risk, and thereby facilitate inclusion of patients in clinical trials for disease modifying therapies.

Are High Frequency Oscillations in Scalp EEG Related to Age? A clinical trial.

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Keywords: high frequency oscillation, electroencephalogram, scalp- EEG, HD- EEG, epilepsy

Abstract Background: High-frequency oscillations (HFOs) have received much attention in recent years, particularly in the clinical context. In addition to their application as a marker for pathological changes in patients with epilepsy, HFOs have

also been brought into context with several physiological mechanisms. Furthermore, recent studies reported a relation between an increase of HFO rate and age in invasive EEG recordings. The present study aimed to investigate whether this relation can be replicated in scalp-EEG.

Methods: We recorded high-density EEG (HD-EEG) from 11 epilepsy patients at rest as well as during motor performance. Manual detection of HFOs was performed by two independent raters following a standardized protocol. Patients were grouped by age into younger (< 25 years) and older (>50 years) participants. Inclusion criteria were sufficient signal to noise ratio (SNR) as well as minimal artificial distortion. Patients who were classified as non-epileptic by the physicians served as controls to test for significant differences between patients suffering from epilepsy and patients with no epilepsy diagnosis. Patients amount of sleep the night before hospitalization as well as a possible lateralization effect regarding an increase of HFO-frequency was tested by comparing the epileptogenic hemisphere with the non-epileptogenic hemisphere.

Results: No significant difference of HFO-rates was found between groups [$U = 10.5$, $p = .429$, $r = .3$]. Furthermore there was no lateralization effect [$r_s = -.397$, $p = .436$] as well as no significant influence of sleep on mean HFO rate detected [$r_s(9) = -.002$, $p = .995$].

Conclusions: Lack of replicability of the age effect regarding HFOs may be due to local propagation patterns of age-related HFOs occurring in deep structures. However, limitations such as small sample size, decreased signal-to-noise ratio as compared to invasive recordings, as well as HFO-mimicking artefacts must be considered as a factor decreasing identifiability of true HFOs in scalp EEG.

Prescription of co-medication in patients with dementia and its association with quality of treatment

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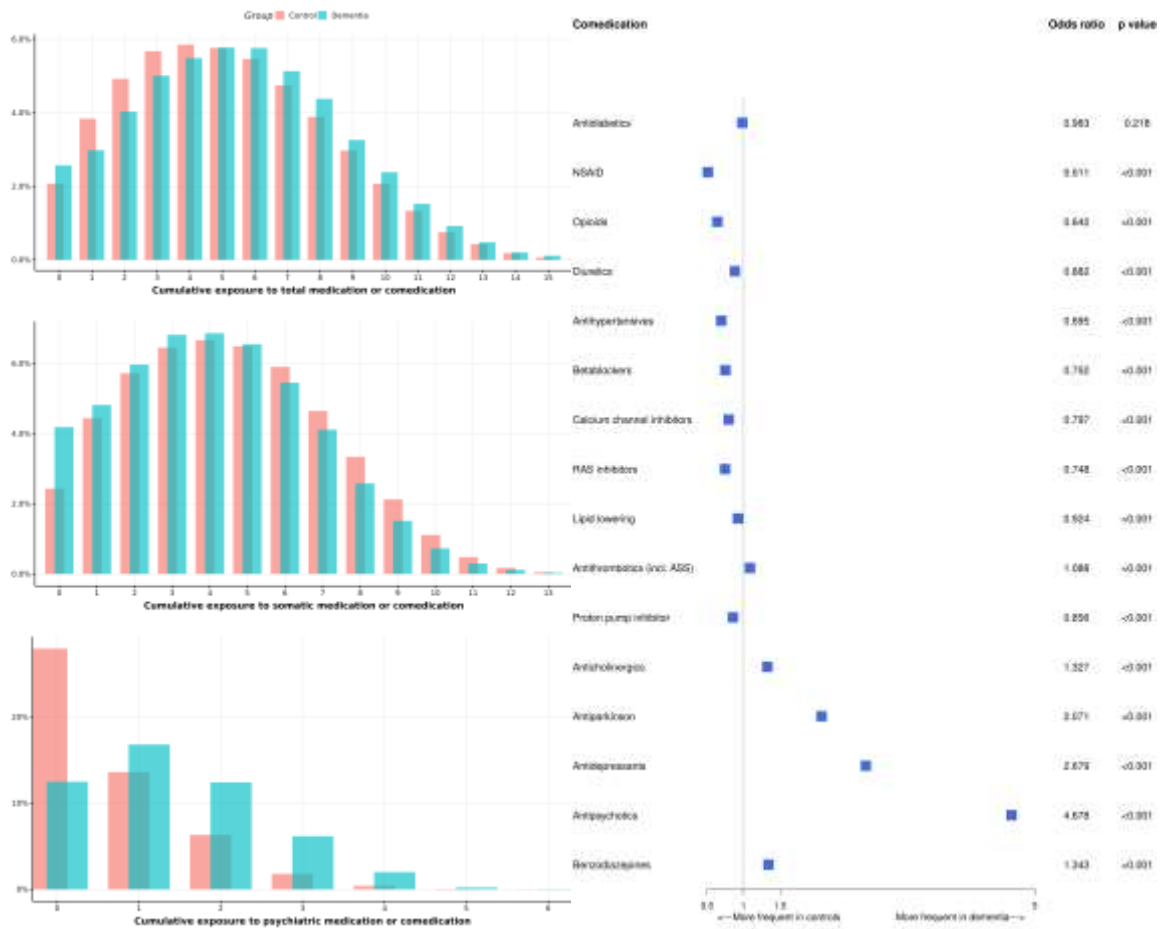
Background: Patients with dementia suffer more frequently from common age-associated diseases such as hypertension, diabetes, or chronic pain. In the absence of disease modifying drugs, optimal treatment of concomitant diseases is important to extend and improve the quality of life.

Methods: We used a national prescription database to compare comedication between patients on antidementive drugs (ADD) and age- and sex-matched controls. Additionally, the association of comedication with treatment patterns of dementia was analysed.

Results: 70799 patients on ADD, aged 80.5 years were matched 1:1 to a control group and followed for 3 years. Patients on ADD were exposed to a mean of 5.5 comedICATIONS while control patients were treated with a total of 5.2 drugs ($p < 0.001$, Table 1). Polypharmacy was significantly more frequent in dementia (59.9% vs 55.3%, Figure 1a). Separating medication into psychiatric and somatic, we found that patients on ADD received significantly less somatic (4.1 vs 4.5, Figure 1b) but significantly more psychiatric medication (1.4 vs 0.7, Figure 1c). Patients on ADD were significantly less likely to receive medication used to treat pain, cardiovascular conditions or hyperlipidemia, but more likely to be treated with antithrombotics and anticholinergics (Figure 2). More comedication was associated with markers of higher quality of antedementia treatment, i.e. lower odds of discontinuation and higher odds of switching or escalating treatment (Table 2).

Conclusion: Patients on ADD are treated with more medications than controls but less frequently treated for somatic conditions that are known to be more prevalent in patients with dementia. However, more comedication was associated with higher quality of antedementia treatment, possibly indicating better medical care. Together, our data suggest that management of comorbidities in dementia could be improved, leading to gains in outcome and quality of life.

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Automatisierte Früherkennung der Alzheimer Demenz: Linguistische Merkmale in der Spontansprache als geeignete Prädiktoren?

Einleitung: Im Bereich der Früherkennung der Demenz haben sich sprachliche Merkmale (phonetische, semantisch-lexikalische und syntaktische Variablen) in der Spontansprache von Patienten im Vor- und/oder Frühstadium der Demenz als vielversprechende und zuverlässige Indikatoren erwiesen. Diese sprachübergreifenden, Erfolg versprechenden Ergebnisse unterliegen jedoch zum Teil großen Variationen in der Klassifizierungsgenauigkeit, die auf einen sehr heterogenen methodischen Ansatz zurückzuführen sind.

Ziel: Ziel der laufenden Studie ist es zu überprüfen, ob linguistische Marker in Spontansprachproben potentielle Prädiktoren in der Früherkennung der Alzheimer Demenz sind. Zudem soll evaluiert werden, ob ein automatisches Früherkennungsverfahren mittels Support Vector Machine (SVM), das auf einem ausgewählten Set linguistischer Marker beruht, eine zuverlässige Methode zur Detektion früher neurokognitiver Störungen ist.

Methode: Es werden 50 gesunde und 50 kognitiv beeinträchtigte Personen rekrutiert (25 mit leichter kognitiver Beeinträchtigung, 25 im Frühstadium der Alzheimer Demenz; Alter: zw. 65 und 85 Jahren; muttersprachlich Deutsch; ausreichendes bzw. ausreichend korrigiertes Hör- und Sehvermögen). Für jeden Studienteilnehmer wird ein kognitives Leistungsprofil erstellt. Ferner wird die Stichprobe hinsichtlich anderer Grunderkrankungen und Medikation kontrolliert. Die Erhebung der Spontansprachproben erfolgt über die Elizitierung semi-spontaner Sprache mittels Bildbeschreibungsaufgaben (1 Situationsbild, 4 Bildergeschichten). Dadurch soll jeweils ein Level von > 50 sprachlichen Äußerungen erreicht werden und erstmals auch Begriffe, die kognitive mentale und affektive mentale Zustände offenbaren (engl. *mental state language*), berücksichtigt werden. Nach der orthografischen Transkription der Spontansprachproben werden aus den erstellten Textkorpora linguistische Merkmale mit Hilfe manueller und computergestützter Verfahren (u.a. PRAAT Software) extrahiert und das Potential der linguistischen Diskriminatoren mittels statistischer Verfahren validiert. Mit Hilfe eines Klassifikationsalgorithmus (künstliche Intelligenz, KI) soll das Früherkennungspotential der linguistischen Marker überprüft werden.

Ergebnisse/Ausblick: Dieser Kurzvortrag arbeitet den Forschungsstand zu dieser Thematik auf und gibt einen Einblick in die laufende Studie (Datenerhebung, Extrahieren linguistischer Merkmale auf Basis bereits erhobener Spontansprachsequenzen).

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Cross-sectional study on the relationship between free water diffusion MRI and cognitive speed in healthy aging

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Introduction: Increases of extracellular free water (FW) are suggested to provide pathophysiological information on the aging brain. The aim of the present study was to examine the association between FW in white matter hyperintensities (WMH) as well as normal appearing white matter (NAWM) and cognitive speed in healthy aging. Furthermore, the importance of FW to determine processing speed was compared to standard diffusion and structural MRI measures.

Methods: The community-dwelling cohort of healthy elderly was composed of 292 participants free of stroke and dementia from the Austrian Stroke Prevention Study who underwent brain MRI and neuropsychological examination. Linear regression analysis and random forest analysis were used to assess the relative importance of FW in WMH and NAWM, FW-corrected diffusion measures (FA_t, AD_t, MD_t, RD_t) and measures derived from conventional MRI (normalized brain volume, WMH volume, lacunes) to determine a composite score of cognitive speed.

Results: Simple linear regressions adjusted for age and hypertension revealed that all FW and DTI measures, except MD_t in NAWM, showed a significant association with cognitive speed while the structural MRI measures from conventional MRI did not. Random forest analyses showed that FW in WMH and NAWM had the highest variable importance among all MRI measures for cognitive speed.

Discussion: The superior contribution of FW in WMH and NAWM as a determinant of cognitive speed suggests that increasing extracellular water in the white matter is associated with cognitive dysfunction in the elderly.

The cross-sectional study design is a possible limitation of the results. Longitudinal studies are warranted to assess the rate of FW change with advancing age and its predictive value for cognitive dysfunction in the elderly.

Conclusion: In a healthy aging population FW in WMH and NAWM is more crucial for cognitive speed than standard DTI and structural brain measures.

LGI-1 Autoimmune Enzephalitis – ein Imitator der Demenz?

3 Fallbeispiele von unserer Kohorte

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Hintergrund: Autoimmune Enzephalitiden (AIE) sind antikörper-assoziierte zerebrale Erkrankungen. Die LGI1 Enzephalitis ist die häufigste AIE, die einem dementiellen Syndrom nachahmen kann. Bei Demenzverdacht sollte sie bedacht werden, da die PatientInnen von einer immunsuppressiven Therapie profitieren. Hier präsentieren wir 3 PatientInnen und wollen auf mögliche Red flags aufmerksam machen.

Methode: Fallbericht

Fallberichte:

Patient 1: Der 62-jährige Patient wurde wegen neu aufgetretenen Verwirrheitszuständen und Panickattacken seit einer Woche auf dem Notfall vorgestellt. Im Serum und Liquor war der LGI-1 AK positiv. Wegen subtilen epileptischen Anfällen wurde der Patient antikonvulsiv eingestellt. Unter der immunsuppressiven Therapie hat sich der Patient kognitiv und psychiatrisch gebessert und die Anfallshäufigkeit hat sich signifikant reduziert.

Patient 2: Der 69-jährige Patient wurde wegen „Gedächtnislücken“ und Verwirrheitszustände seit 2 Wochen vorgestellt. Im Serum und Liquor war die LGI-1 AK positiv. Unter der immunsuppressiven Therapie waren eineinhalb Jahre später nur mehr leichte Leistungsminderungen präsent.

Patient 3: Die 70-jährige Patientin wurde wegen akuter Verwirrtheit und Gedächtnisstörung nach einer Episode mit Bewusstseinsverlust vorgestellt. Im Serum und Liquor war der LGI-1 AK positiv. Unter der Kortisontherapie hat sich vor allem das autobiographische Gedächtnis deutlich gebessert.

Diskussion: Laut einer rezenten Studie¹ erfüllten 38% der PatientInnen über 45 Jahre von 290 AIE-PatientInnen die Demenzkriterien nach NINCDS-ADRDA (2011). 62% von denen hatte eine LGI-1 Enzephalitis. Wichtige Red flags waren die rasche Progression der kognitiven Verschlechterung, subtile Anfälle und auffällige Befunde in den Zusatzuntersuchungen, die atypisch für neurodegenerative Erkrankungen sind. Die zeitige Diagnose ist für die rasche Therapie und bessere Prognose essenziell. Daher sollen auf diese Red flags im Rahmen der Demenzabklärungen geachtet werden.

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Leitfadengestützte Interviews mit Betreuungspersonen von Menschen mit intellektueller Beeinträchtigung zu wahrgenommenen Symptomen und Veränderungen bei Demenz

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Einleitung: Die allgemeine Lebenserwartung von Menschen mit intellektueller Beeinträchtigung (IB) ist in den letzten Jahrzehnten gestiegen (Dieckmann et al., 2016; Ng et al., 2015). Damit steigt auch das Risiko von Menschen mit IB, an altersinduzierten Krankheiten wie Demenz zu erkranken (Grundwald et al., 2017). Für die Möglichkeit einer positiven Beeinflussung des Verlaufs einer Demenzerkrankung ist eine frühe Diagnose wichtig (Falk, 2015). Allerdings ist dies aufgrund der Komplexität der Erkrankung sowie der nicht angemessenen Berücksichtigung der Merkmale einer bereits bestehenden IB seitens der diagnostischen Methoden besonders schwierig (Haveman & Stöppler, 2020).

Das Ziel der vorliegenden Studie ist es, Symptome und Veränderungen der Demenz bei Menschen mit IB zu erfassen. Folgende Forschungsfrage wird adressiert: Welche Veränderungen und Symptome im Zusammenhang mit einer Demenz bei Menschen mit IB werden von Betreuungspersonen beobachtet?

Untersuchungsmethode: Zur Erhebung der wahrgenommenen Veränderungen und Symptome durch Betreuungspersonen werden leitfadengestützte Interviews durchgeführt. Wichtiges Kriterium für die Auswahl der Stichprobe ist, dass die Betreuungspersonen mindestens seit einem Jahr eine Person mit IB und Demenz begleiten. Insgesamt werden 41 Interviews mit Betreuungspersonen der Behindertenhilfe (35 Frauen, 6 Männer) durchgeführt. Der Interviewleitfaden thematisiert alltagspraktische Fähigkeiten, Verhalten und Emotionen, kognitive Fähigkeiten und körperliche Fähigkeiten der Personen mit IB und Demenz. Der Leitfaden wurde mit drei Betreuungspersonen pilotiert und anschließend überarbeitet. Die Datenerhebung erfolgte von Juli bis Oktober 2021. Die Interviews wurden transkribiert und inhaltsanalytisch ausgewertet.

Ergebnisse: Erste Ergebnisse der Interviews zeigen, dass vor allem Veränderungen im Verhalten von Menschen mit IB von den Betreuungspersonen frühzeitig wahrgenommen werden. Beispielsweise gehen sie gewohnten Interessen und Hobbies nicht mehr nach oder führen Rituale nicht mehr aus. Weitere Ergebnisse werden bei der Tagung präsentiert.

Literatur

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Table 1

	Dementia (n = 70799)	Control (n = 70799)	p-value
Age (mean (SD))	80.50 (6.36)	80.50 (6.36)	1
Male (%)	22512 (31.8)	25677 (36.3)	<0.001
Follow-up, years (mean (SD))	3.05 (1.92)	3.10 (1.95)	<0.001
Total number of medication (mean (SD))	5.49 (3.17)	5.21 (3.09)	<0.001
Somatic total (mean (SD))	4.11 (2.59)	4.54 (2.65)	<0.001
Antidiabetics (%)	12273 (17.3)	12449 (17.6)	0.221
NSAID (%)	25609 (36.2)	37216 (52.6)	<0.001
Opioids (%)	17059 (24.1)	23436 (33.1)	<0.001
Diuretics (%)	23510 (33.2)	25520 (36.0)	<0.001
Antihypertensives (%)	5410 (7.6)	7532 (10.6)	<0.001
Beta blockers (%)	23109 (32.6)	27748 (39.2)	<0.001
Calcium channel blockers (%)	16390 (23.2)	19414 (27.4)	<0.001
RAS Antagonists (%)	36383 (51.4)	41465 (58.6)	<0.001

Lipid lowering (%)	22062 (31.2)	23279 (32.9)	<0.001
Antithrombotics (incl. ASS) (%)	39005 (55.1)	37525 (53.0)	<0.001
Proton pump inhibitors (%)	41655 (58.8)	44287 (62.6)	<0.001
Anticholinergics (%)	17923 (25.3)	14408 (20.4)	<0.001
Antiparkinson (%)	12181 (17.2)	6455 (9.1)	<0.001
Psychiatric total (mean (SD))	1.38 (1.13)	0.66 (0.89)	<0.001
Antidepressants (%)	39923 (56.4)	23049 (32.6)	<0.001
Antipsychotics (%)	36537 (51.6)	13143 (18.6)	<0.001
Benzodiazepines (%)	15823 (22.3)	12498 (17.7)	<0.001

Table 2 - Markers of quality of antidementive treatment

Treatment event	Comedication	OR	95% CI lower	95% CI upper	P-value
Early discontinuation	Total	0.84	0.84	0.85	<0.001
Early discontinuation	Somatic	0.82	0.81	0.82	<0.001
Early discontinuation	Psychiatric	0.75	0.74	0.76	<0.001
Escalation to memantine	Total	1.14	1.13	1.14	<0.001
Escalation to memantine	Somatic	1.11	1.10	1.12	<0.001
Escalation to memantine	Psychiatric	1.54	1.51	1.57	<0.001
Switch to another AChEI	Total	1.16	1.15	1.17	<0.001
Switch to another AChEI	Somatic	1.14	1.14	1.15	<0.001
Switch to another AChEI	Psychiatric	1.54	1.51	1.56	<0.001

Assessing Data Repositories for Answering Clinical Questions Related to Alzheimer's disease.

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Introduction: The increasing availability of published datasets has opened possibilities for neurological analyses of data generated by other neurologists. The Open Science movement is developing tools to analyze data hosted in governmental and research repositories (for example, the European Open Science Cloud, <https://www.eosc.eu>). We are investigating the practical difficulties in using data generated by others, for example, assessing its validity and relevance. In this presentation, we report on our experiences in locating meaningful data to answer AD-related clinical questions.

Methods: From the registry of research data repositories (<http://www.re3data.org>, n=89) and Wikipedia's list of neuroscience databases (n=48), we selected 9 relevant data repositories and characterized them from neurological and information science perspectives. We applied for registration with 4 repositories. We developed clinical questions with the goals of assessing data validity and yielding clinical insights and tried to use available data to answer these questions.

Results: Of the 9 repositories, 3 don't share any data, 4 require registration, and 2 allow open access. Registration approval times are not published. Answering clinical questions with available datasets is challenging. Located datasets (n=8) support the hypothesis of positive effects of cognitive activity, but data correlating age or education with the risk of developing AD or about the risk of conversion of MCI to AD are hard to find (n=0). One repository describes the key results about the efficacy of Acetylcholinesterase inhibitors but does not provide corresponding data.

Conclusion: While repositories host relevant data, there are practical hurdles in gaining clinical insights. Data is not always accessible, the quality of online data sets is questionable, verifying the relevance and validity of data is difficult, and policies for using these data are elusive.

Wearable and App-based behavioral health intervention targeting dementia onset and progression

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Introduction: Dementia has long been considered not to be preventable. However, the FINGER study showed a positive effect after a 2-year intervention targeting several lifestyle and vascular risk factors simultaneously. The H2020 LETHE project tries to establish an information and communications technology (ICT) prediction and intervention framework using Machine Learning methods targeting risk factors causing dementia.

Methods: The approach of LETHE is to implement the promising FINGER intervention protocol through ICT sensing and intervention technology and establish new digital biomarkers. The digital biomarkers can serve as features for the mentioned dementia and risk factor prediction model and provide insights to both disease detection and symptom assessment. The digital biomarkers will be based on long-term behaviour data collected through wearables and apps and determine aspects of a lifestyle domain that is affected by the disease. The preventive lifestyle intervention will make use of individualized profiling, personalized recommendations, feedback and support.

The setup will be validated in a trial with a runtime of 24 months and will take place in centers from four different countries. The validation trial will include 160 individuals. Each of the four centers will include 20 participants as a LETHE intervention group and 20 participants as control group (self-guided multimodal group). Participants complying with the inclusion (age 66-77, CAIDE Dementia Risk Score ≥ 6 points, etc.) and exclusion criteria (dementia, other neurological diseases, current or past AD medication, etc.) will be randomized in the LETHE intervention and control group. The focus-group will receive the LETHE intervention automated by the above described ecosystem, and the Control Group will receive regular healthcare. Recruitment of participants will be done from the well-established memory clinics of the respective clinical centers.

Results and Conclusion: First trial results are expected in July 2022.

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On the way to a Dementia- competent society in Austria: online-learning programs for different professional groups

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Background: Police officers and Persons working in the public administration often serve as a first point of contact in critical situations for both persons with dementia and their relatives. In order to be sensitive to the special needs of persons with dementia, training is essential. Therefore, online- learning programs for these important groups were initiated.

Methods: In order to specifically target the needs of specific professional groups (Police Officers, Community workers), focus groups were organized in which experiences and needs of the respected professional groups were discussed. Contents of the discussion were analysed, and important topics were defined, and teaching contents developed. Additionally, different certification processes for the different groups were developed. The learning programs are implemented on the E-learning platform of the Ministry for Internal Affairs and are easily accessible.

Results: Taking the results of the discussions into account internet-based learning modules were developed and evaluated in the respective groups. Currently, there are two online-learning programs “Mission Dementia for the Police and “Active Community for community employees” available. To date over 14.000 Police Officers have been trained and 250 Police Stations are “Dementia competent”. A similar certification process for community employees just started.

Discussion: Online-learning programs are well- accepted by police officers and community employees and may be an effective and economically interesting method for awareness building when implemented on easy to reach internet platforms. This method could be further extended to other professional groups.