COVID-19 Articles

Potential neurological impact of coronaviruses; implications for the novel SARS-CoV-2. Joy D. Iroegbu, Chibuzor W. Ifenatuoha & Omamuyovwi M. Ijomone (Nigeria)

https://link.springer.com/article/10.1007/s10072-020-04469-4

Coronaviruses (CoV) are viruses widely known to cause severe respiratory distress due to the prominent clinical symptoms presented. These symptoms, which include fever and dry cough, are frequently found in individuals with CoV infection. Neurological manifestations of CoV have often been neglected; however, recent studies have reported neurological consequences of CoV infection. Here, we review these literatures and discuss the neurologic impact of CoV while highlighting potential implications of the novel SARS-CoV-2 in the nervous system. We also discuss the possible routes by which these viruses invade the nervous system and the mechanism by which they may induce neurological damage.

Rising evidence for Neurological Involvement in COVID-19 Pandemic

Calcagno N, Colombo E, Maranzano A, Pasquini J, Sarmiento IJK, Trogu F, Silani V (Italy)

https://link.springer.com/article/10.1007/s10072-020-04447-w

Neurology and the COVID-19 emergency

Alfredo Berardelli, Vincenzo Silani, Paolo Barone, Paolo Calabresi, Paolo Girlanda, Leonardo Lopiano, Luca Massacesi, Salvatore Monaco, Marco Onofri, Cristina Tassorelli & Gioacchino Tedeschi (Italy)

https://link.springer.com/article/10.1007/s10072-020-04465-8#author-information

Dealing with immune-mediated neuropathies during Covid-19 Outbreak Practical Recommendations from the Task force of the Italian Society of Neurology (SIN), the Italian Society of Clinical Neurophysiology (SINC) and the Italian Peripheral Nervous System Association (ASNP)

Raffaele Dubbioso, Eduardo Nobile-Orazio, Fiore Manganelli, Lucio Santoro, Chiara Briani, Dario Cocito, Gioacchino Tedeschi, Vincenzo Di Lazzaro, Gian Maria Fabrizi & on behalf of SIN, SINC and ASNP (Italy)

https://link.springer.com/article/10.1007/s10072-020-04448-9

New challenges from Covid-19 pandemic: an unexpected opportunity to enlighten the link between viral infections and brain disorders?

Alessandro Gialluisi, Giovanni de Gaetano & Licia Iacoviello (Italy)

https://link.springer.com/article/10.1007/s10072-020-04444-z
Early Guillain-Barré syndrome in coronavirus disease 2019 (COVID-19): a case report from an Italian COVID-hospital

Donatella Ottaviani, Federica Boso, Enzo Tranquillini, Ilaria Gapeni, Giovanni Pedrotti, Susanna Cozzio, Giovanni M Guerrera & Bruno Giometto (Italy)

https://link.springer.com/article/10.1007/s10072-020-04449-8

Guillain-Barré syndrome (GBS) is an acute polyradiculoneuropathy associated with dysimmune processes, often related to a previous infectious exposure. During Italian severe acute respiratory syndrome coronavirus-2 outbreak, a woman presented with a rapidly progressive flaccid paralysis with unilateral facial neuropathy after a few days of mild respiratory symptoms. Coronavirus was detected by nasopharyngeal swab, but there was no evidence of its presence in her cerebrospinal fluid, which confirmed the typical albumin-cytological dissociation of GBS, along with consistent neurophysiological data. Despite immunoglobulin infusions and intensive supportive care, her clinical picture worsened simultaneously both from the respiratory and neurological point of view, as if reflecting different aspects of the same systemic inflammatory response. Similar early complications have already been observed in patients with para-infectious GBS related to Zika virus, but pathological mechanisms have yet to be established.

An Italian multicenter retrospective-prospective observational study on neurological manifestations of COVID-19 (NEUROCOVID)

Carlo Ferrarese, Vincenzo Silani, Alberto Priori, Stefania Galimberti, Elio Agostoni, Salvatore Monaco, Alessandro Padovani, Gioacchino Tedeschi & on behalf of Italian Society of Neurology (SIN) (Italy)

https://link.springer.com/article/10.1007/s10072-020-04450-1

Neurological manifestations of COVID-19 have been described in both single case reports and retrospective scanty case series. They may be linked to the potential neurotropism of the SARS-COV-2 virus, as previously demonstrated for other coronaviruses. We report here the description of a multicenter retrospective-prospective observational study promoted by the Italian Society of Neurology (SIN), involving the Italian Neurological Departments, who will consecutively recruit patients with neurological symptoms and/or signs, occurred at the onset or as a complication of COVID-19. Hospitalized patients will be recruited in COVID wards or in COVID wards; in the latter cases, they will be referred from other specialists to participant neurologists. Outpatients with clinical signs of COVID and neurological manifestations will be also referred to participating neurologists from primary care physicians. A comprehensive data collection, in the form of electronic case report form (eCRF), will register all possible neurological manifestations involving central nervous systems, peripheral nerves, and muscles, together with clinical, laboratory (including cerebrospinal fluid, if available), imaging, neurological, neurophysiological, and neuropsychological data. A follow-up at hospital discharge (in hospitalized patients), and for all patients after 3 and 6 months, is also planned. We believe that this study may help to intercept the full spectrum of neurological manifestations of COVID-19 and, given the large diffusion at national level, can provide a large cohort of patients available for future more focused investigations. Similar observational studies might also be proposed at international level to better define the neurological involvement of COVID-19.

Diagnosing Herpes Simplex-1 encephalitis at the time of COVID-19 pandemic

Carlo Lovati, Maurizio Osio & Leonardo Pantoni (Italy)

https://link.springer.com/article/10.1007/s10072-020-04461-y

Telemedicine and technological devices for Amyotrophic lateral sclerosis in the era of COVID-19

Fabiola De Marchi, Roberto Cantello, Serena Ambrosini, Letizia Mazzini & On Behalf of the CANPALS Study Group (Italy)

https://link.springer.com/article/10.1007/s10072-020-04457-8

Assessing disability and relapses in multiple sclerosis on tele-neurology

Marcello Moccia, Roberta Lanzillo, Vincenzo Brescia Morra, Simona Bonavita, Gioacchino Tedeschi, Letizia Leocani,
Luigi Lavorgna & on behalf of the Digital Technologies Web and Social Media Study Group of the Italian Society of Neurology (Italy)

Background As a consequence of the coronavirus disease 2019 (COVID-19) pandemic, a large amount of consultations will be delivered through tele-medicine, especially for diseases causing chronic disability and requiring immunomodulatory treatments, such as multiple sclerosis (MS).

Methods We have hereby reviewed available tools for tele-neurology examination in MS, including components of neurological examination that can be assessed through video, patient-reported outcome measures (PROMs), and digital technology.

Results Overall, we have suggested a battery for assessing MS disability and relapses on tele-medicine, which brings together conventional examination, PROMs (e.g., Patient Determined Disease Steps, MS Impact Scale), and cognitive tests (Symbol Digit Modalities Test) that can be delivered remotely and in multiple languages.

Discussion The use of common tools for neurological examination could improve tele-neurology practice for both general neurologists and MS specialists, and quality of care for people with MS.

https://link.springer.com/article/10.1007/s10072-020-04470-x

Self-reported needs of patients with Parkinson’s disease during COVID-19 emergency in Italy

Tommaso Schirinzi, Rocco Cerroni, Giulia Di Lazzaro, Claudio Liguori, Simona Scalise, Roberta Bovenzi, Matteo Conti, Elena Garasto, Nicola Biagio Mercuri, Mariangela Pierantozzi, Antonio Pisani & Alessandro Stefani (Italy)

https://link.springer.com/article/10.1007/s10072-020-04442-1

Because of COVID-19 outbreak, regular clinical services for Parkinson’s disease (PD) patients have been suddenly suspended, causing worries, confusion and unexpected needs in such frail population. Here, we reviewed the messages spontaneously sent by patients to an Italian PD clinic during the first two weeks of COVID-19 lockdown (9–21 March 2020), in order to highlight their main needs and then outline appropriate strategies of care for this critical period. One hundred sixty-two messages were analyzed. Forty-six percent queried about clinical services; 28% communicated an acute clinical worsening for which a therapeutic change was done in 52% of cases; 17% (those patients with younger age and milder disease) asked about the relationship between PD and COVID-19; 8% informed about an intercurrent event. Our analysis suggests that PD patients’ needs during COVID-19 emergency include appropriate and complete information, a timely update on changes in clinical services, and the continuity of care, even in a remote mode. By addressing these issues, acute clinical worsening, complications and subsequent therapeutic changes could be prevented. In this perspective, telecommunication systems and virtual medicine should be implemented.

Letter to editor: brain awareness week, CoVID-19 infection and neurological sciences

Saeedeh Mosafirchi, Alireza Mortezapour & Rashid Heidarimoghadam. (Iran)

https://link.springer.com/article/10.1007/s10072-020-04441-2

Other reviews and articles

Reviews

Management of dysphagia in Huntington’s disease: a descriptive review

Nicole Pizzorni1 & Francesca Pirola1 & Andrea Ciammola2 & Antonio Schindler1 (Italy)

https://link.springer.com/article/10.1007/s10072-020-04265-0

Huntington’s disease (HD) is a rare neurodegenerative disorder of the central nervous system characterized by involuntary choreic movements, cognitive, behavioral, and psychiatric disturbances. Most HD suffer from dysphagia and aspiration pneumonia is the leading cause of death. However, little is known about dysphagia management in HD. A revision of the literature was conducted to depict the state of the art on the assessment and treatment of dysphagia in HD. Literature search of the last 10 years was performed using PubMed and EMBASE. Twenty-four studies were included: 16 cross-sectional studies, 2 case reports, 2 case series, 2 open-label trials, 1 pre-post study, and 1 randomized controlled trial. Based on the studies retrieved, dysphagia should be assessed from the early stage of the disease, especially when specific clinical markers occur. Timing for dysphagia re-assessment should be based on the recommendation of the swallowing experts on the individual case. Instrumental assessment of swallowing by videofluoroscopy or videendoscopy is feasible and recommended to diagnose dysphagia in patients with HD. Clinical assessment tools and patient-reported outcome measures may be used to complete the swallowing examination, but not to replace instrumental assessment. The impact of pharmacological and rehabilitative treatments on dysphagia in HD has been little studied in literature. While the effect of...
Objective Orthostatic hypotension (OH) is a common non-motor sign of Parkinson’s disease (PD). Several epidemiological studies have estimated the association between OH and PD with controversial results. Here, a meta-analysis was conducted to evaluate the association between them. Methods PubMed, Embase, Web of Science, CNKI (Chinese National Knowledge Infrastructure), VIP (Database of Chinese Scientific and Technical Periodicals), and Wanfang databases were searched for eligible publications from October 2003 to December 2017. Prevalence numbers from studies were pooled using a non-linear random-effects meta-analysis. Random effect model was used to calculate the pooled odds ratio (OR) with 95% confidence intervals (CIs) from individual studies. Publication bias was estimated by Egger’s test, Begg’s test, and the funnel plot. Results Nineteen studies involving 1620 PD patients and 898 healthy controls were included in this meta-analysis. The pooled estimate of the prevalence of OH in PD was 27.7% compared with 7.9% of that in control. The pooled OR of OH with PD was 4.343 (95% CI 3.323–5.676) with a low heterogeneity (I² = 12.5%, P heterogeneity = 0.301). Conclusion In the present meta-analysis, the pooled OR of OH with PD was 4.343 (95% CI 3.323–5.676) with a low heterogeneity, which showed a significant association between OH and increased risk of PD.

Research on cognitive and sociocognitive functions in patients with brain tumors: a bibliometric analysis and visualization of the scientific landscape

Milena Pertz & Stoyan Popkirov & Uwe Schlegel & Patrizia Thoma (Germany)

Background Many patients with brain tumors exhibit mild to severe (neuro)cognitive impairments at some point during the course of the disease. Social cognition, as an instance of higher-order cognitive functioning, specifically enables initiation and maintenance of appropriate social interactions. For individuals being confronted with the diagnosis of a brain tumor, impairment of social function represents an additional burden, since those patients deeply depend on support and empathy provided by family, friends and caregivers. Methods The present study explores the scientific landscape on (socio)cognitive functioning in brain tumor patients by conducting a comprehensive bibliometric analysis using VOS viewer. The Web of Science Core Collection database was examined to identify relevant documents published.
between 1945 and 2019. Results A total of 664 English titles on (socio)cognitive functions in patients with brain tumors was retrieved. Automated textual analysis revealed that the data available so far focus on three major topics in brain tumor patients: cognitive functions in general and in paediatric cases, as well as psychological factors and their influence on quality of life. The focus of research has gradually moved from clinical studies with cognitive functions as one of the outcome measures to investigations of interactions between cognitive functions and psychological constructs such as anxiety, depression or fatigue. Medical, neurological and neuropsychological journals, in particular neuro-oncological journals published most of the relevant articles authored by a relatively small network of well interconnected researchers in the field. Conclusion The bibliometric analysis highlights the necessity of more research on social cognition in brain tumor patients

**Value of thrombus imaging in predicting the outcomes of patients with large-vessel occlusive strokes after endovascular therapy**

Shuang-jiao Huang, Shan-shan Diao, Yue Lu, Tan Li, Lu-lu Zhang, Yi-ping Ding, Qi Fang, Xiu-ying Cai, Zhan Xu & Yan Kong (China)

https://link.springer.com/article/10.1007/s10072-020-04296-7

Background Acute ischemic stroke leads to serious long-term disability and high mortality, especially in patients with large vessel occlusive strokes. Nowadays, endovascular therapy is considered as an alternative treatment for these patients. Several studies have used thrombus characteristics based on non-contrast computed tomography (NCCT) and computed tomography angiography (CTA) to predict prognosis in ischemic stroke. The AA conducted a systematic review to identify potential imaging predictive factors for successful recanalization and improved clinical outcome after endovascular therapy in patients with large vessel occlusion (LVO) in anterior arterial circulation. Methods The PubMed databases were searched for related studies reported between September 18, 2009, and September 18, 2019. Results The AA selected 11 studies on revascularization and 12 studies on clinical outcome. Patients with thrombus of higher Hounsfield unit (HU), shorter length, higher clot burden score, and increased thrombus permeability may achieve higher recanalization and improved clinical outcome, but the matter is still under debate. Conclusion Imaging of thrombus can be used as an assessment tool to predict the outcomes and it needs further studies in the future.

**ORIGINAL ARTICLES**

**The role of the neuropsychologist in memory clinics**

Emilia Salvadori, Leonardo Pantoni, on behalf of the Società Italiana di NeuroGeriatrica (SINEG) (Italy)

https://link.springer.com/article/10.1007/s10072-020-04253-4

International recommendations and guidelines on the diagnosis and management of cognitive impairment highlight the relevance of a multidimensional approach with increasing attention to well-established cognitive evaluations and interventions. Memory clinics represent a model that offers the expertise of several health specialties. This commentary aims at detailing the contribution of the neuropsychologist in this setting, and highlighting the need of implementing its presence in the dedicated services. The neuropsychologist can offer an expertise that can be employed both in clinical routes and research, being able to synergistically interact with all the other health specialists involved in memory clinics. The role of the neuropsychologist in cognitive impairment diagnosis includes the development and the administration of comprehensive test batteries and the determination of both the degree of impairment and the cognitive profile, thus contributing to differential diagnoses. In the management of cognitive impairment, the neuropsychologist expertise can treatment response. In cognitive impairment research, beyond the development and administration of test batteries, the neuropsychologist can contribute actively to the choice of cognitive study outcomes, data analysis, and results interpretation within an interdisciplinary framework. An overview of the actual weight of neuropsychologists in Italian memory clinics shows that, despite the presence of a psychologist in the team could be felt as an added value, several difficulties are still encountered in the integration of this figure as a permanent member. Efforts need to be made in this direction.

**Decreased visible deep medullary veins is a novel imaging marker for cerebral small vessel disease**

Xiaodong Chen, Lei Wei, Jihui Wang, Yilong Shan, Wei Cai, Xuejiao Men, Sanxin Liu, Zhuang Kang, Zhengqi Lu, Vincent C. T. Mok, Aimin Wu (China)

https://link.springer.com/article/10.1007/s10072-019-04203-9

Purpose Visibility of deep medullary veins (DMVs) seen at SWI is predictive of poor prognosis in ischemic stroke. Few attentions have been paid to DMVs in atherosclerotic cerebral small vessel disease (aCSVD) which is attributed to long-term
imbalanced microhemodynamics. The AA conducted this retrospective study to explore the association between DMVs profiles and a CSVD risk factors, neuroimaging markers. Methods Two hundred and two patients identified as a CSVD from January 2017 to March 2019 were included in the study. Their demographic, clinical, laboratory, and neuroimaging data were reviewed. The quantity and morphology of DMVs were assessed with a 5-grade (range 0 ~ 4) visual rating scale. Total CSVD burden was calculated with an ordinal “SVD score” (range 0 ~ 4). Spearman rank correlation and multivariable logistic regression analysis were performed to determine the association between DMV scale and CSVD markers. Results DMV scale showed strong positive correlation with CSVD burden (rs =0.629, P < 0.001). Age (OR 1.078, 95% CI 1.015–1.145, P = 0.015) and hypertension (OR 2.629, 95% CI 1.024–6.749, P = 0.045) were two demographic risk factors for high DMV scale. Among CSVD neuroimaging markers, periventricular WMH (OR 2.925, 95% CI 1.464–5.845, P = 0.002), deep WMH (OR 2.872, 95% CI 1.174–7.022, P = 0.021), lacunae (OR 1.961, 95% CI 1.181–3.254, P = 0.009), and cerebral atrophy (OR 2.046, 95% CI 1.079–3.880, P = 0.028) were associated with high DMV scale after adjusting for clinical and metabolic confounders. Conclusion Multifactorial association between DMV scale and epidemiological, radiological contributors of aCSVD suggests DMV’s involved pathomechanism may participate in aCSVD development. Attach importance to DMV radiological profile in aCSVD will provide more neuroimaging information for diagnosis and prognosis.

An analysis of 109 fetuses with prenatal diagnosis of complete agenesis of corpus callosum

Ayşe Kaçar Bayram, Mehmet Serdar Kütük, Selim Doganay, Mahmut Tuncay Özgün, Hakan Gümüş, Mustafa Baştüg, Sefer Kumandaş, Mehmet Canpolat, Hüseyin Per (Turkey)

https://link.springer.com/article/10.1007/s10072-019-04224-4

Background Agenesis of the corpus callosum (ACC) is the most frequent congenital malformation of the brain. It continues to be an important cause of the pregnancy termination associated with the central nervous system (CNS). Objective The aim of the study is to provide a comprehensive assessment of fetuses with diagnosis of complete ACC, as well as postnatal neurodevelopmental outcomes. Methods The data of 75,843 fetuses were screened for evaluation of complete ACC between 2003 and 2017, and a total of 109 cases with complete ACC were included in the study. ACC was considered isolated when no additional anomalies were detected, and ACC was considered complex when additional anomalies were present. Results The prevalence of complete ACC was 9.4 per 10,000 live births, and the incidence was ranged from 1.8 to 16.6 per 10,000 person-years. Patients with isolated ACC had a significantly higher survival when compared with patients with complex ACC (97.4%, n = 38/39 vs. 68.8%, n = 22/32, P = 0.001). The most important cause of death were congenital heart disease and/or respiratory failure during neonatal period. Developmental and intellectual disabilities were significantly higher in the complex ACC cases (P < 0.001). Postnatal neurodevelopmental outcomes were completely normal in 79.4% of cases with isolated ACC. Conclusions Isolated complete ACC is usually associated with a favorable outcome. The most important prognostic factors are the presence or absence of associated congenital anomalies.

Brain activity underlying face and face pareidolia processing: an ERP study

Gülsüm Akdeniz (Turkey)

https://link.springer.com/article/10.1007/s10072-019-04232-4

Face pareidolia is described as an interpretation of any unrelated object seen for the first time as a face. It is still unclear how to face pareidolia is processed. In this study, the neural basis of face and face pareidolia processing was investigated through recording event-related potentials (ERPs). Methods The ERPs were recorded from 35 right-handed and healthy participants in response to faces and face pareidolia. Amplitudes and latencies of N170, vertex-positive potential (VPP), and N250 components were analyzed, and current source density (CSD) maps relevant to these components were obtained. Results N170 response was earlier and larger in response to faces compared to face pareidolias. VPP is also evoked earlier in response to faces as in the case of N170; however, the VPP amplitude was larger for face pareidolias than for faces. Statistical analyses did not reveal any differences between faces and face pareidolias in terms of N250 component. Conclusion The results indicated that faces and face pareidolias are processed in the early stages of visual perception. In addition, the N250 component does not reflect the neural processing of faces and face pareidolias.

Awareness of rare and genetic neurological diseases among italian neurologist. A national survey

Michelangelo Mancuso, Massimiliano Filosto, Costanza Lamperti, Olimpia Musumeci, Filippo M Santorelli, Serenella Servidei, Enza M Valente, Massimo Zeviani, Gianluigi Mancardi, Gioacchino Tedeschi, Antonio Federico (Italy)

https://link.springer.com/article/10.1007/s10072-020-04271-2
Rare neurological diseases (RNDs) are a heterogeneous group of disorders mainly affecting the central and peripheral nervous systems, representing almost 50% of all rare diseases; this explains why neurologists are very often involved in their diagnosis, treatment and research. The purpose of this study was to quantitatively describe the awareness of RNDs among the neurological community of the Italian Society of Neurology (SIN). A survey of the Italian Neurogenetics and Rare Neurologic Diseases Scientific Group of the SIN, similar to what was submitted to the members of the EAN Task Force on Rare Neurologic Diseases and to EAN Panels Scientific Committee Management Groups, was launched in January 2019 in order to verify the specific Italian situations and possibly the regional differences. Answers were collected online. We observed that Italian Members of the SIN Neurogenetics and Rare Neurologic Diseases Scientific Group are well aware of the burden posed by RNDs but at the national and regional level, the relative awareness is sketchy and disparate. Although many national initiatives have been undertaken to facilitate the diagnosis and management in Italy, the survey reveals that much work has to be done in supporting RNDs patients, including a deeper collaboration between politics, universities and all stakeholders in the field.