SUPPLEMENT 8

HONG KONG

Volume 25 Number 5 **October 2019**

MEDICAL JOURNAL
香港醫學雜誌

The official publication of the
Hong Kong Academy of Medicine and
the Hong Kong Medical Association

6th Hong Kong Neurological Congress
cum
32nd Annual Scientific Meeting of
The Hong Kong Neurological Society

9 – 10 November 2019

第六屆香港腦科會議
暨
第三十二屆
香港腦科學會　週年學術會議

二零一九年十一月九日至十日

ISSN 1024-2708

香港醫學專科學院出版社
HONG KONG ACADEMY OF MEDICINE PRESS

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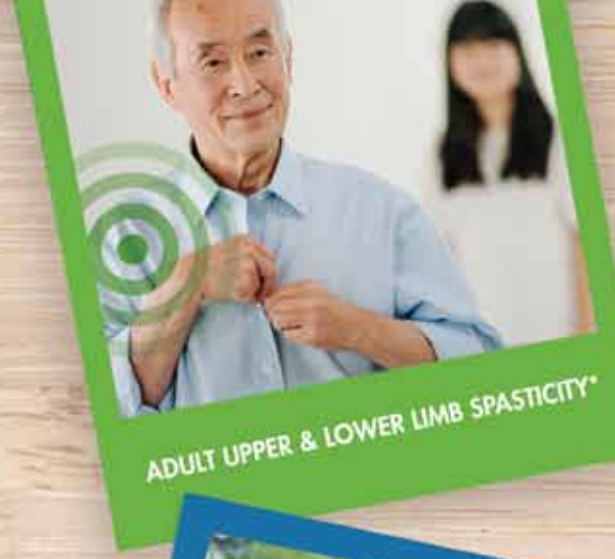

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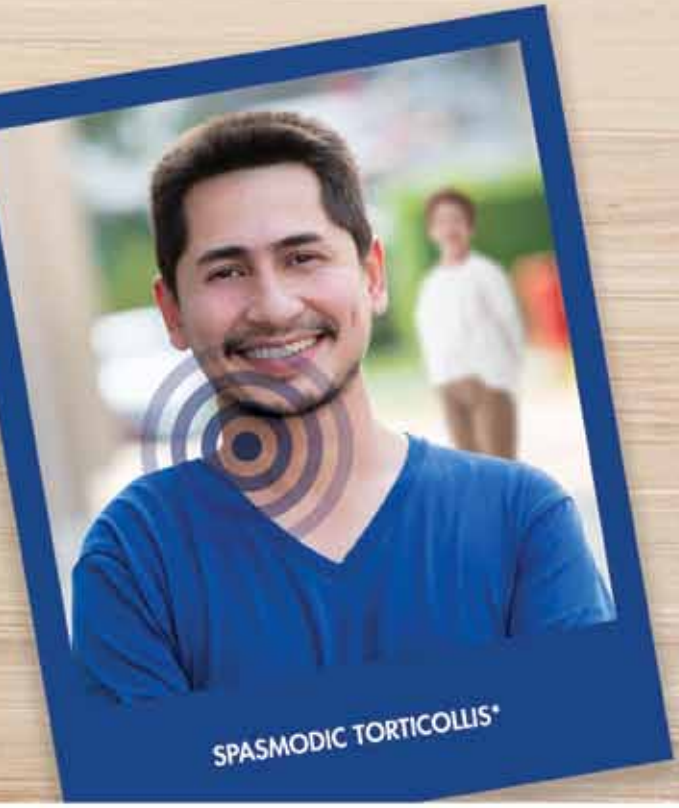

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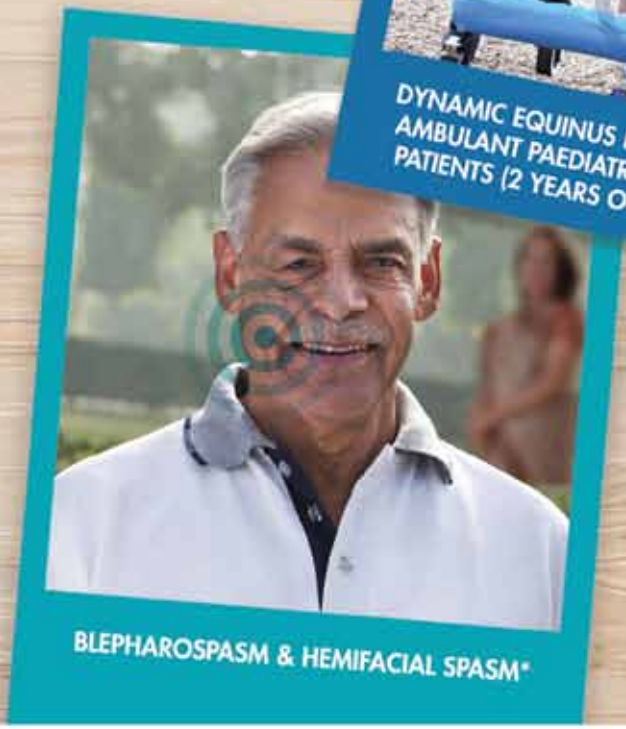

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References:
1. David M. Simpson, Mark Hallett, et al. Practice guideline update summary: Botulinum neurotoxin for the treatment of blepharospasm, cervical dystonia, adult spasticity, and headache. American Academy of Neurology. 2016 May 10; 86(19): 1818-1826. Accessed on 16 October 2019. **2.** Suthipun Jitpimolmard, Somsak Tiamkao, et al. Long term results of botulinum toxin type A (Dysport) in the treatment of hemifacial spasm: a report of 175 cases. J Neural Neurosurg Psychiatry 1998;64:751-757. Published on 1 June 1998. **3.** Ipsen Neurosciences https://www.ipsen.com/our-science/neuroscience/ (last accessed 16 October 2019). **4.** Dysport® (Hong Kong Prescribing Information), Ipsen Biopharma Limited February 2012. **5.** Dysport® (Patient Information Leaflet), Ipsen Biopharm Limited. September 2017

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HONG KONG MEDICAL JOURNAL 香港醫學雜誌
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6th Hong Kong Neurological Congress cum 32nd Annual Scientific Meeting

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Scientific Programme

Venue: Grand Ballroom, Level 3, JW Marriott Hotel, Admiralty, Hong Kong SAR

9 November 2019, Saturday

		Function Room
08:30 – 09:00	Registration	
09:00 – 10:30	**Education Session** Chairperson/Judge: *YP Chu* **Electroencephalography basic technology, montages, electrodes, and localisation** *Sándor Beniczky* **Electroencephalography in critical care setting** *Sándor Beniczky*	**Poster Presentation**
10:30 – 11:00	Coffee Break	
11:00 – 11:45	**Dissertation Highlights** Chairpersons/Judges: *Bell Tse, Nelson Cheung, Carlin Chang* **Clinical characteristics and outcomes of patients with medication refractory epilepsy after epilepsy surgery: a retrospective study in Hong Kong** *CT Ip* **Clinical characteristics and risk factors of haemorrhagic transformation in patients with acute ischaemic stroke: a retrospective study over 2013-2018** *CH Kwan* **Trends of ischaemic stroke subtypes: an observational study over 15 years** *Bonaventure Ip*	
12:00 – 12:15	**Opening Ceremony** (Guest of Honour: *Prof Sophia Chan, JP, Secretary for Food and Health*)	
12:30 – 14:00	**Merck Lunch Symposium** Chairperson/Judge: *Jacky Lee* **Real-world experience with immune reconstitution therapy** *Tomas Kalincik*	
14:10 – 14:45	**Free Paper Presentation** Chairpersons/Judges: *Betty Ng, Bell Tse, Carlin Chang* **Thrombolysis in the 'oldest old' patients with acute ischaemic stroke** *CH Cheung* **Neurological profile in a cohort of genetically confirmed m.3243A>G MT-TL1 mutation carriers** *YLT Lam*	
14:45 – 15:00	Coffee Break	
15:00 – 16:30	**Boehringer Ingelheim Stroke Symposium** Chairpersons/Judges: *Richard Li, Yannie Soo* **From trials to practices: a holistic approach to manage stroke patients** *Kenneth Butcher* **Latest advances in reperfusion therapies: how to treat most patients faster** *Andrei V Alexandrov*	
18:00	Faculty Dinner (by invitation only)	

10 November 2019, Sunday

		Function Room
08:15 – 08:30	Registration	
08:30 – 10:00	**Eisai Multiple Sclerosis Symposium** (Co-organised with Hong Kong Multiple Sclerosis Society) Chairpersons/Judges: *WK Cheng, KL Shiu* **Making choices in the new era of multiple sclerosis treatment** *Ludwig Kappos* **Progressive multifocal leukoencephalopathy detection and multiple sclerosis monitoring** *Cristina Granziera*	**Poster Presentation**
10:00 – 10:15	**Coffee Break / Poster Viewing Session** Chairpersons/Judges: *WK Cheng, Yannie Soo* **Development of acute stroke services in a private hospital in Hong Kong** *Tina SW Ma* **It is never a Good Syndrome** *Annie Mew* **A man with hearing loss and progressive unsteady gait due to superficial siderosis** *LY Wong*	
10:15 – 11:45	**Novartis Headache Symposium** Chairpersons/Judges: *Carlin Chang, KY Cheung* **Headache and facial pain: local perspective** *Raymond CK Chan* **New insights in migraine management** *Terrance Li* **Medication overuse headache** *Shuu-Jiun Wang*	
12:00 – 13:00	**Novartis Lunch Symposium** Chairperson/Judge: *PW Ng* **Anti-CGRP: the game changer in migraine prevention** *Peter J Goadsby*	
13:15 – 14:45	**Movement Disorders Symposium** (Co-organised with Hong Kong Movement Disorder Society) Chairpersons/Judges: *Helen Yip, Michael Lee* **Surgical treatment for dystonia and other hyperkinetic disorders** *Shiro Horisawa* **Advances in atypical parkinsonian conditions for practising clinicians** *Helen Ling*	
14:45 – 15:00	Coffee Break	
15:00 – 16:30	**Eisai Epilepsy Symposium** (Co-organised with Hong Kong Epilepsy Society) Chairpersons/Judges: *YP Chu, Colin Lui* **Wearable device for seizure detection** *Sándor Beniczky* **AMPA-antagonist for Chinese patients with refractory epilepsy: a prospective longitudinal study** *Howan Leung*	
16:30 – 16:40	Closing Ceremony and Award Presentations	

Electroencephalography basic technology: montages, electrodes, and localisation

ES 1

Sándor Beniczky
Department of Clinical Neurophysiology, Aarhus University Hospital, Denmark
Department of Clinical Neurophysiology, Danish Epilepsy Centre, Dianalund, Denmark

Understanding basic technological aspects and signal generation is essential for correct electroencephalographic (EEG) interpretation in clinical practice. This presentation reviews (1) how electric currents are generated and how they determine the EEG signal; (2) how position and localisation of the cortical source determines the distribution of negative and positive potentials on the scalp; (3) how this is shown in different montages and in the amplitude (voltage) maps; and (4) the importance of appropriate electrode array for recording and characterising the EEG signals.

Electroencephalography in critical care setting

ES 2

Sándor Beniczky
Department of Clinical Neurophysiology, Aarhus University Hospital, Denmark
Department of Clinical Neurophysiology, Danish Epilepsy Centre, Dianalund, Denmark

Electroencephalography (EEG) is the most reliable method for monitoring the function of the central nervous system. In critically ill patients, EEG is a useful tool in the diagnostic workup of patients with altered consciousness. EEG is necessary for diagnosing non-convulsive status epilepticus and for monitoring the therapeutic effect in patients with status epilepticus. Specific EEG patterns are predictors of seizures in critically ill patients. EEG and its reactivity provide important clues for the prognosis in these patients. This presentation focuses on the indications of EEG in critically ill patients, criteria for seizures and for status epilepticus, and patterns indicating increased risk for seizures.

DH 1

Clinical characteristics and outcomes of patients with medication refractory epilepsy after epilepsy surgery: a retrospective study in Hong Kong

CT Ip, Colin HT Lui
Department of Medicine, Tseung Kwan O Hospital, Hong Kong SAR

Background: Epilepsy surgery is a well-established treatment for medically intractable epilepsy. The rate of achieving seizure freedom is promising in carefully selected patients. Distinctive local data on surgical outcome and prognostic indicators are lacking. We aim to evaluate the clinical characteristics and factors associated with postoperative seizure outcome and cognitive consequences in patients undergoing epilepsy surgery.
Methods: A retrospective analysis was conducted in patients aged ≥18 years who underwent epilepsy surgery at Queen Elizabeth Hospital from January 1998 to July 2017. Surgical outcomes were assessed using Engel classification at 1 year after surgery and at the latest clinic visit. Independent predictors for unfavourable outcome (Engel Class II, III, and IV) were determined using the logistic regression model for those who underwent temporal lobe epilepsy surgery.
Results: A total of 70 surgical events were analysed. The mean patient age at surgery was 39.4 years. The median duration from onset of epilepsy to surgery was 20 years. The most common structural abnormality identified was mesial temporal sclerosis (55.7%). Favourable surgical outcome (Engel Class I) was achieved in 41 (58.6%) patients at 1 year and 38 (54.3%) at the latest follow-up. In the temporal lobe epilepsy surgical subgroup (n=57), favourable outcome was achieved in 66.7% and 59.6% of patients at 1 year and at the latest clinic visit, respectively. Tapering of anti-epileptic drugs was allowed in 39 (68.4%) patients. 15.4% of patients who received left-side surgery had verbal memory decline. Patients who had right-side surgery had significant visual memory improvement (P=0.006). Multivariate logistic regression analysis showed that a higher seizure frequency at the time of pre-surgical evaluation (odds ratio [OR]=7.53, 95% confidence interval [CI]=1.97-28.71, P=0.003), pathologies other than mesial temporal sclerosis, focal cortical dysplasia, cavernoma or glioma/brain tumours on magnetic resonance imaging of the brain (OR=15.81, 95% CI=1.33-187.42, P=0.029) were significant predictors for unfavourable surgical outcome at 1 year.
Conclusion: The success rate of epilepsy surgery in a Hong Kong tertiary hospital was comparable to that of international cohorts. Identification of independent factors for unfavourable surgical outcome (high pre-operative seizure frequency and pathologies other than mesial temporal sclerosis, focal cortical dysplasia, cavernoma or glioma/brain tumours) may help prognostication and patient counselling during pre-surgical evaluation.

DH 2

Clinical characteristics and risk factors of haemorrhagic transformation in patients with acute ischaemic stroke: a retrospective study over 2013-2018

CH Kwan
Department of Medicine and Geriatrics, Ruttonjee Hospital, Hong Kong SAR

Background: Haemorrhagic transformation (HgT) of acute ischaemic stroke is common and can increase mortality and morbidity and create dilemma in management. However, local demographic data concerning HgT are limited.
Objective: This study aims to delineate the clinical characteristics of acute ischaemic stroke patients with HgT in Hong Kong and evaluate associated clinical risk factors.
Methods: A total of 115 patients admitted during 2013 to 2018 with a diagnosis of acute ischaemic stroke and with HgT developed within 14 days of stroke onset were included. Of them, 66 were clinically significant HgT (CSHgT). For comparison, 228 ischaemic stroke patients without HgT during the same period who had repeated computed tomography of the brain within 14 days were included. Demographics of patients with HgT and CSHgT were compared with those without HgT. Univariate analysis was performed to identify potential variables associated with HgT and CSHgT. Then multivariate logistic regression was performed, with HgT and CSHgT as dependent variables.
Results: HgT patients and non-HgT patients had comparable 3-month survival (77.9% vs 85.8%, P=0.094). Compared with non-HgT patients, CSHgT patients had poorer post-stroke outcomes, including lower 3-month survival (73.4%, P=0.033) and higher modified Rankin Scale score at post-stroke 1 month (P=0.007) and 3 months (P=0.010). Independent factors associated with increasing HgT and CSHgT risks were presence of atrial fibrillation (odds ratio [OR]=12.27 for HgT and OR=14.02 for CSHgT, both P<0.001) and larger infarct size (OR=1.011, P=0.001 for HgT; OR=1.010, P=0.006 for CSHgT).
Conclusion: CSHgT (rather than all HgT) is associated with increased mortality and morbidity. Presence of atrial fibrillation and larger infarct size are independent variables for higher risks of HgT and CSHgT.

DH 3

Trends of ischaemic stroke subtypes: an observational study over 15 years

Bonaventure Ip
Department of Medicine and Therapeutics, Prince of Wales Hospital, Shatin, Hong Kong SAR

Introduction: In view of population ageing and contemporary cardiovascular risk factor control, understanding the trends of ischaemic stroke mechanisms may inform stroke prevention strategy and guide resources allocation.
Methods: We studied the trends of stroke mechanisms by TOAST classification over a 15-year period (2004-2018). We retrieved demographic data, pre-defined cardiovascular risks, use of medications, intensity of risk factor control, and clinical outcomes (2-year recurrence and 3-month mortality and disability) from the stroke registry of a regional hospital in Hong Kong. We defined stroke mechanism by clinical signs and symptoms, cardiovascular risk profile, and infarct topography. We compared the trends of stroke mechanisms by Chi-square test for trend and continuous variables by one-way ANOVA with post-hoc Bonferroni test. Interobserver reliability was assessed by kappa statistics.
Results: We included 5982 patients over the 15-year period. The number of atrial fibrillation (AF)–related stroke increased from 18.8% to 31.7% (P<0.001) and the number of large-artery-disease-related stroke decreased from 23.5% to 9.7% (P<0.001). Patients with AF-related stroke had the highest mean age (77.4±11 years, P<0.001) and National Institute of Health Stroke Scale score on admission (interquartile range=20, P<0.001). Within patients with AF-related stroke, the number of strokes as first presentation of AF increased by 200% and the 2-year recurrence of stroke or transient ischaemic attack in patients with symptomatic intracranial atherosclerosis (ICAS) decreased from 20.7% to 7.1% but not significantly (P=0.06).
Conclusion: We observed a significant increase in AF-related stroke and newly diagnosed AF at presentation over the 15-year period. Our results demand an enhanced surveillance in detecting AF, primary prevention, and thrombectomy facilities given the high morbidity and mortality associated with AF-related strokes. The decline in ICAS-related stroke and its recurrence may underscore the importance of intensive risk factor management in the Asia-Pacific region where ICAS remained prevalent.

Real-world experience with immune reconstitution therapy

S 1

Tomas Kalincik
Multiple Sclerosis and Neuroimmunology, Royal Melbourne Hospital, Australia

The therapeutic landscape for relapsing multiple sclerosis is evolving. The number of disease-modifying therapies has expended. Immune reconstitution is emerging as a promising treatment strategy for multiple sclerosis and can achieve prolonged treatment effects after a short treatment course. Cladribine is an immune reconstitution therapy indicated for adult patients with highly active relapsing multiple sclerosis confirmed by clinical or imaging features. In this symposium, I focus on the real-world evidence generated from 2011 Australian patient familiarisation programme data, a head-to-head comparative effectiveness of cladribine in MSBase, and additional real-world cladribine data recently reported.

From trials to practices: a holistic approach to manage stroke patients

S 2

Kenneth Butcher
Clinical Neuroscience, Prince of Wales Hospital, University of New South Wales, Australia

Non-vitamin K antagonist oral anticoagulants (NOACs) are considered to be the standard of care for primary and secondary stroke prevention in patients with atrial fibrillation (AF). Accumulating evidence from both randomised controlled trials and real-world data have suggested favourable safety and efficacy profiles of NOACs in stroke prevention. Although the favourable safety profiles have been demonstrated in the absence of a specific reversal agent, rapid reversal of anticoagulant activity is desirable in certain clinical situations such as intracranial haemorrhage. Although these situations may be rare, an immediate-acting specific reversal agent that removes drug-induced anticoagulation may substantially improve emergency management by providing physicians with an additional option.

Despite the overall superior efficacy of NOACs compared with warfarin, residual risks of ischaemic stroke cannot be eliminated. The management of acute ischaemic stroke in patients on active anticoagulation is challenging, as these patients remain contraindicated to thrombolytic therapy. Recent data have suggested the strategy of thrombolysis following administration of a specific reversal agent. Most patients experienced significant clinical improvements without reports of bleeding or thrombotic complications to date.

Currently, international guidelines recommend stroke thrombolysis up to 4.5 hours from onset depending on individual patient data. Emerging data from randomised controlled trials and a meta-analysis provide support of thrombolysis for patients with favourable perfusion imaging 4.5 to 9 hours after stroke, including patients with wake-up stroke. In this session, Prof Kenneth Butcher gives an overview of evidence supporting an extended time window for thrombolysis, along with data of NOACs in secondary stroke prevention and the currently available reversal strategies to anticoagulation therapy.

Latest advances in reperfusion therapies: how to treat most patients faster

S 3

Andrei V Alexandrov
City-wide Stroke Team, University of Tennessee Heath Science Center, Memphis, USA

Extended window for intravenous tissue-type plasminogen activator (tPA) with WAKE-UP trial and overwhelming success of mechanical thrombectomy trials prompted code stroke activation for up to 24 hours from last known well or unknown onset. This unprecedented extension of the time window places emphasis on identification of candidates for reperfusion therapies not only at centres equipped with multimodal imaging but also across all facilities where potential stroke patients are being evaluated.

In case of systemic thrombolytic therapy, clinical determination of a disabling deficit and non-contrast computed tomography (CT) remain the mainstay of patient selection applicable at any level. Selection of patients for thrombectomy remains challenging as pre-hospital scales are only up to 80% accurate and definitive imaging of proximal intracranial large vessel occlusions is not yet universally available.

To address these challenges, our city-wide stroke team implemented the following: (1) Hospitals are pre-notified by emergency medical services of all suspected stroke patients, and physician evaluates them on arrival; (2) Vascular neurologist is notified before CT to confirm physician findings; (3) All patients undergo non-contrast head CT and head and neck CT angiography (regardless of stroke severity or creatinine levels); (4) intravenous tPA is given to all eligible patients after non-contrast CT; and (5) Head and neck CT angiography are evaluated by vascular neurologist who activates the neuro-endovascular team for thrombectomy candidates.

Our city-wide stroke team achieved the highest per-capita reperfusion treatment rate of 700+ intravenous tPA and 300 mechanical thrombectomy per 1.3 million population per year (>53 and >23 per 100 000 inhabitants, respectively). Further implementation of the mobile stroke unit equipped with Somatom Scope, Siemens CT scanner performing 16 slice head CT and head and neck CT angiography in the field resulted in accurate triage to comprehensive stroke centres and shortest field-to-groin-puncture time for mechanical thrombectomy candidates.

Making choices in the new era of multiple sclerosis treatment

S 4

Ludwig Kappos
Department of Neurology, University Hospital Petersgraben 4, Basel, Switzerland

With the advent of more disease-modifying therapies for relapsing-remitting multiple sclerosis, it becomes more challenging for neurologists to choose the most suitable drug for each patient. Prof Kappos shares up-to-date information on different treatments of relapsing-remitting multiple sclerosis.

Progressive multifocal leukoencephalopathy detection and multiple sclerosis monitoring

S 5

Cristina Granziera
Biomedical Engineering, University of Basel, Basel, Switzerland
Neurology, Basel University Hospital, Basel, Switzerland

The use of magnetic resonance imaging in diagnosing and monitoring of multiple sclerosis and treatment-related complications is evolving. Despite the pathogenesis of progressive multifocal leukoencephalopathy (PML) induced by disease-modifying therapies, early recognition of PML on neuroimaging can facilitate prompt diagnosis and treatment to improve prognosis and outcome.

Headache and facial pain: local perspective

S 6

Raymond CK Chan
Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong SAR

Headache or facial pain is a common neurological problem. It can be debilitating and results in impaired quality of life and increased psychosocial burden to patients and their family. In this talk, I discuss the spectrum and characteristics of patients in an outpatient headache and facial pain clinic.

New insights in migraine management

S 7

Terrance Li
Pro-care specialist Centre, Hong Kong SAR

Migraine is a very common neurological disorder. It affects 4% to 7% of males and 11% to 14% of females in Asian. Traditionally, we use beta-blockers, tricyclic anti-depressants, anti-epileptic drugs, and calcium channel blockers as migraine preventive medications. However, none are specifically designed for migraine. In 1982, scientists discovered the particle CGRP. Further experiments confirmed that the level of CGRP increases during migraine attacks. In 2017, phase 3 clinical trial further confirmed the efficacy of monoclonal antibody to CGRP peptide/ligand and monoclonal antibody to CGRP receptor in migraine prevention. This presentation discusses this new target-driven medication for migraine prevention. The CGRP monoclonal can be used in both episodic and chronic migraine. Around 40% to 50% of patients can achieve 50% reduction in migraine days. It improves the quality of life for migraineurs as measured by Migraine Disability Assessment, Headache Impact Test, and Migraine Interictal Burden Scale. The challenging decisions are to select patients who are most in need (because of the cost consideration) and when to stop medication if patient responses well.

Medication overuse headache

S 8

Shuu-Jiun Wang
The Neurological Institute, Taipei Veterans General Hospital, Taipei, Taiwan

Medication overuse headache is a prevalent chronic headache disorder. It develops with a pre-existing headache disorder (most often migraine) in some patients and is a consequence of an overuse of any type of analgesics or migraine-specific medication that can be used to treat headache. In this presentation, I review the current knowledge for medication overuse headache and share my experiences in Taiwan.

Anti-CGRP: the game changer in migraine prevention

S 9

Peter J Goadsby
Department of Neurology, King's College, London, UK
Department of Neurology, University of California San Francisco, USA

The development of triptans improves the lives of migraineurs. However, there remains unmet need to reduce migraine-associated disability. Meanwhile, much has been learned concerning the pathophysiology of migraine, including the mechanism(s) of the treatments. The major aim of this lunch symposium is to give an oversight on the present knowledge about how migraine can be viewed and diagnosed, the role of CGRP in migraine pathophysiology, and thus the role of CGRP pathway antagonism in migraine prevention.

Surgical treatment for dystonia and other hyperkinetic disorders

S 10

Shiro Horisawa
Department of Neurosurgery, Tokyo Women's Medical University, Tokyo, Japan

Hyperkinetic movement disorders include dystonia, tremor, chorea, myoclonus, and other kinds of abnormal involuntary movements. Oral medications and botulinum toxin injections can improve these conditions, but a great number of patients remain to have refractory hyperkinetic movement disorders.

Surgical treatment including deep brain stimulation (DBS) and ablative surgery targeting basal ganglia-thalamo-cortical circuit can provide substantial improvement for those with refractory conditions. Ablative procedure includes radiofrequency, gamma knife, and focused ultrasound. The latter has attracted most of the attention, because it enables intracranial focal lesioning without incision.

Tremor is the first common movement disorders and the best candidate of DBS or ablative surgery on thalamic nucleus (ventral intermediate nucleus). Bilateral thalamotomy was once abandoned owing to its severe complications such as dysarthria, dysphonia, and dysphagia. In those who require bilateral intervention, DBS has played a significant role. Recent studies have confirmed the safety and efficacy of bilateral ventral intermediate nucleus thalamotomy. Posterior subthalamic area is also a target for tremor in DBS or ablation. Tremor is well investigated with less-invasive procedure, such as gamma knife and focused ultrasound ablation.

Dystonia can develop from focal to generalised, and treatment targets are different according to its distribution. Globus pallidus internus (GPi) is the current mainstay target for cervical, segmental, or generalised dystonia. However, stimulation- or ablation-induced parkinsonism may inhibit optimal effects. To avoid complications associated with GPi, we applied the pallidothalamic tract for those with midline dystonia. This target has significant effect on levodopa-induced dyskinetic movement in Parkinson disease. The effect of pallidothalamic tract is similar to that of GPi ablation (pallidotomy). Distal limb dystonia (hand and foot dystonia) requires intervention of ventro-oral nucleus of thalamus. Ventro-oral nucleus thalamotomy using radiofrequency, gamma knife, or focused ultrasound has long-term effect on focal hand dystonia.

In this presentation, I discuss mainly tremor, dystonia, and levodopa-induced dyskinesia with the use of radiofrequency, gamma knife, and focused ultrasound ablation and DBS.

Advances in atypical parkinsonian conditions for practising clinicians

S 11

Helen Ling
Queen Square Brain Bank, Institute of Neurology, University College London, UK
Queen Elizabeth Hospital, Kings Lynn, UK

Early accurate diagnosis of atypical parkinsonian disorders (APD) such as multiple system atrophy, progressive supranuclear palsy, and corticobasal syndrome can be challenging. In many cases, transient or the lack of response to levodopa may offer the initial clue to APD. Other clinical pointers are postural hypotension and prominent urinary symptoms for multiple system atrophy, vertical supranuclear gaze palsy and early postural instability for progressive supranuclear palsy, and prominent clumsiness of a limb related to apraxia and dystonia for corticobasal syndrome. Although the quests for effective disease-modifying drugs for APD are gathering momentum, many red flag symptoms can be effectively managed in an out-patient setting. In this presentation, symptomatic treatment strategies for motor, autonomic, behavioural, and neuropsychiatric are discussed. Many are also applicable for advanced Parkinson disease. With an aim of maintaining patient dignity and improving quality of life, multidisciplinary input (from speech and language therapist, dietician, occupational therapist, physiotherapist, and palliative care team) is often neglected yet an essential component of the treatment paradigm.

Wearable devices for seizure detection

S 12

Sándor Beniczky
Department of Clinical Neurophysiology, Aarhus University Hospital, Denmark
Department of Clinical Neurophysiology, Danish Epilepsy Centre, Dianalund, Denmark

There is need for automated seizure detection using mobile or wearable devices for objective seizure documentation and for decreasing morbidity and mortality associated with seizures. A number of articles have addressed non-electroencephalography (EEG)-based seizure detection. However, the quality of study design and reporting is heterogeneous. This presentation aims at giving a clear picture on the current state of seizure detection using wearable devices and describing the level of evidence behind the various devices. So far, 16 clinical studies of phase 2 or above have demonstrated that non-EEG-based wearable devices detected generalised tonic-clonic seizures (GTCS) with high sensitivity (>90%) and low false alarm rate (0.2/day). There is limited evidence for detection of motor seizures other than GTCS, mostly from subgroups in larger studies. There is little evidence for non-EEG-based detection of non-motor seizures: sensitivity is low (19% to 74%) with extremely high false alarm rate (50-216/day). In conclusion, detection of GTCS is reliable, and there are several validated devices in the market. However, detection of other seizure types needs further research.

AMPA-antagonist for Chinese patients with refractory epilepsy: a prospective longitudinal study

H Leung, SL Yuen, K Ma, B Ip, SH Ma, T Leung, KL Yip, V Mok
Division of Neurology, Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong SAR

Introduction: Perampanel is a new antiepileptic drug that has been licensed in Hong Kong since 2014. It acts on ionotropic α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor of glutamate. It is a non-competitive antagonist and has a half life of approximately 105 hours. The mechanism of perampanel offers new treatment opportunities for patients with refractory epilepsy.

Aim: To evaluate the efficacy of perampanel among patients with refractory epilepsy, to assess its treatment emergent adverse effects including neuropsychiatric symptoms, and to measure caregiver burden during perampanel treatment.

Methods: Perampanel was given in an 8-week titration phase followed by an 8-week maintenance phase. Patients were evaluated at baseline and at the end of the 16-week period, with clinical history and examination, blood tests, the 12-domain neuropsychiatric inventory (for neuropsychiatric symptoms and behavioural disturbances), and the 22-item Zarit Burden Interview (for physical, mental, social, and economic burdens of caregiver). Thereafter, patients entered into the observation period with variable follow-up periods. Inclusion criteria were age ≥18 years, refractory epilepsy (ie failure of ≥2 antiepileptic drugs), and informed consent at participation.

Results: A total of 53 patients (62.3% female) were prospectively recruited. The mean patient age was 40.4 (standard deviation, 12.3; range, 21-64) years. The intention-to-treat analysis showed that the 50% responder rate was 47.2% in the titration phase and 47.2% in the maintenance phase. The proportion of patients achieving seizure freedom was 11.3% and 15.1% in the respective phases. The mean change in seizure frequency was -223.6% and -261.7%, respectively. The mean number of antiepileptic drugs taken was 2.31. A subgroup analysis of patients with encephalitis (n=8) showed that the 50% responder rate was 25% in the titration phase and 50% in the maintenance phase. In particular, a high proportion of seizure freedom was found in the maintenance phase (25%, P=0.59). There were 11 early withdrawals. Treatment emergent adverse effects were recorded in 58.5% of patients, with drowsiness/sleepiness/tiredness being the most common (20.8%), followed by dizziness (11.3%), behavioural problem (7.5%), and weight gain (7.5%). There was no incidence of deranged liver functions. The mean dosage of perampanel was 2.09 mg/d during the maintenance phase and 3.13 mg/d during the observation period. The neuropsychiatric inventory score decreased from pre-treatment to post-treatment (13.57±12.105 vs 11.98±10.9, P=0.28), as did the Zarit Burden Interview score (41.05±19.2 vs 36.45±15.6, P=0.21).

Conclusion: Perampanel as an adjunctive therapy for epilepsy is clinically efficacious and well tolerated. A subgroup analysis of patients with encephalitis suggested promising results. For those who responded, the proportion achieving seizure freedom was higher.

Thrombolysis in the 'oldest old' patients with acute ischaemic stroke

FP 1

CH Cheung, B Sheng, YP Chu, WT Wong, HH Kwan, LP Ng, YLT Lam
Department of Medicine and Geriatrics, Princess Margaret Hospital, Hong Kong SAR

Background: Intravenous thrombolysis is an effective treatment in acute ischaemic stroke. However, its use in the 'oldest old' patients (age ≥85 years) may have limited benefit. We reviewed the clinical characteristics and outcomes of this group of patients receiving thrombolysis in a local hospital.
Method: This is a retrospective review of 'oldest old' patients with acute ischaemic stroke who were admitted to the Acute Stroke Unit of Princess Margaret Hospital and received intravenous thrombolysis during July 2011 to June 2019. Data analysed included clinical presentation, stroke aetiology, onset to needle time, National Institutes of Health Stroke Scale, modified Rankin Scale, and bleeding complications.
Results: We identified 69 patients (38 were female) aged 85 to 99 years who comprised 14% of thrombolysis cases in the studied period. The most common clinical syndrome was total anterior circulation infarct (49%), followed by partial anterior circulation infarct (26%), lacunar infarct (20%), and posterior circulation infarct (4%). 61% of thrombolysis cases were cardioembolic secondary to atrial fibrillation. The onset-to-needle time was within 3 hours in 52% of patients. The mean National Institutes of Health Stroke Scale score dropped from 14 to 12 at 24 hours post-thrombolysis (P=0.006); 17% and 21% of patients achieved independence (modified Rankin Scale score of ≤2) at discharge and at 3 months, respectively. The hospital mortality was 17%, and a further 3% were deceased at 3 months. Six patients (8.7%) were complicated by symptomatic intracranial haemorrhage, and another six had other bleeding events, predominantly haematuria.
Conclusion: Despite an expected high stroke mortality, 20% of the 'oldest old' ischaemic stroke patients could remain functionally independent following intravenous thrombolysis. With careful patient selection, use of thrombolysis should not be limited by biological age alone.

Neurological profile in a cohort of genetically confirmed m.3243A>G MT-TL1 mutation carriers

FP 2

YLT Lam, B Sheng, YP Chu, WT Wong, HH Kwan, LP Ng, CH Cheung
Department of Medicine and Geriatrics, Princess Margaret Hospital, Hong Kong SAR

Background: Mitochondrial encephalopathy, lactic acidosis and stroke-like episodes (MELAS) represents the most common mitochondrial disease, among which the classical pathological genetic mutation is A>G transition of mitochondrially encoded tRNA leucine 1 gene at position 3243 (m.3243A>G, MT-TL1). Despite sharing the same mutation, the spectrum of clinical presentations and disease severity vary largely, from asymptomatic carrier to full-blown multiorgan involvement. Nervous system, nevertheless, is one of the most dominantly involved organ. We therefore reviewed the neurological presentation and clinical outcomes of adult patients with such mutation in Hong Kong.
Method: This is a retrospective review on patients carrying mitochondrial DNA m.3243A>G MT-TL1 mutation who have been followed up at the Department of Medicine and Geriatrics, Princess Margaret Hospital from 2002 to 2018. Clinical data including initial manifestations, neurological presentations, and clinical outcomes were analysed.
Results: A total of 12 male and 4 female patients (median age of onset 28 years; range, 3-56 years) were identified, in which 15 patients had MELAS and one had maternally inherited diabetes and deafness. Twelve of the patients had neurological impairment at initial presentation, including stroke-like attack (58%), seizure (50%), myopathy (25%), and encephalopathy (16%). Among those with stroke-like attack, their age of first attack ranged from 13 to 54 years; 57% had at least one recurrence in lifetime. Except one patient with fatal stroke-like attack at first presentation, most patients had a favourable neurological post-stroke outcome without significant disability (modified Rankin Scale score of ≤2). Six (55%) of 11 patients had focal seizure as initial seizure semiology, and 50% had a history of status epilepticus. Ten patients deceased during the study period; 4 of them had sudden unexpected death.
Conclusion: Neurological manifestation, predominantly stroke-like attack and seizure, was the most common initial presentation among patients carrying mitochondrial DNA m.3243A>G MT-TL1 mutation. Most patients with stroke-like attacks had favourable recovery despite a modest rate of recurrence. Nonetheless, a higher than expected rate of sudden death was observed.

Development of acute stroke services in a private hospital in Hong Kong

P 1

Tina SW Ma, TH Tsoi, Patrick CK Li, PW Ng, Joseph WT Chan, Manbo BL Man
Neurology Centre, Hong Kong Sanatorium and Hospital, Hong Kong SAR
Hospital Administration, Hong Kong Sanatorium and Hospital, Hong Kong SAR

Background: Effective treatment for acute stroke demands concerted multidisciplinary efforts on a 24-hour basis. This poses great challenges to the private sector. Hong Kong Sanatorium and Hospital is the first local private hospital to provide such service with price transparency and packaged care. This study is to evaluate the feasibility, safety, and efficacy of the protocol-based service.
Methods: The Acute Stroke Assessment Programme was commenced in 2016. It is activated by the attending resident medical officer in the 24-hour outpatient department for potential candidates for thrombolysis. The on-call neurologist assesses the patients before admission to decide the diagnosis and thrombolysis treatment. We retrospectively reviewed all patients recorded in the programme registry as of 31 August 2018. The final diagnoses, performance indicators, and outcomes were examined according to the international standard of care by the American Stroke Association.
Results: From 1 March 2016 to 31 August 2018, 53 patients were enrolled in the registry. The final diagnosis was acute ischaemic stroke in 22 patients (41.5%), transient ischaemic stroke in 11 patients (21%), acute haemorrhagic stroke in 7 patients (13%), and non-stroke disorder in 13 patients (24.5%). The diagnoses made by the attending neurologists before admission were verified in this retrospective review. Of the 22 patients with acute ischaemic stroke, 11 (50%) were eligible for thrombolytic therapy. The door-to-needle time ranged from 46 to 127 minutes. No mortality was recorded. The median National Institutes of Health Stroke Scale score on admission was 5 (range, 9-1) and on discharge was 1 (range, 8-0). The median modified Rankin Scale score on discharge was 1 (range, 0-4).
Conclusion: A protocol-based multidisciplinary acute stroke care is feasible, safe, and effective for acute stroke patients in a private hospital.

It is never a Good Syndrome

P 2

YN Mew, KF Hui, PW Ng
Neurology Division, Department of Medicine and Geriatrics, United Christian Hospital, Hong Kong SAR

Good Syndrome is thymoma with immunodeficiency. It is rare and carries a poor prognosis. This case report illustrates a patient with herpes encephalitis who was diagnosed with Good Syndrome. A 65-year-old man with a history of resected thymoma presented with fever, headache, seizures, and visual hallucination. Computed tomography of the brain showed a brain abscess. Emergency craniotomy was performed, and brain biopsy confirmed herpes simplex virus 2 encephalitis. He was later noted to have multiple pathogens and a history of recurrent haemophilus influenzae chest infections and recurrent herpes zoster infections. Underlying immunodeficiency was suspected, and Good Syndrome was confirmed subsequently. He was given a 5-week course of acyclovir, regular intravenous immunoglobulin, and up-to-date vaccinations. Unfortunately, he returned 2 months later with bilateral acute necrotising retinitis by herpes simplex virus type 2 resulting in permanent vision loss. Good Syndrome is a rare condition associated with poor prognosis. Neurologists should be aware of this disease entity to prevent patients from devastating infections when managing patients with myasthenia gravis and/or thymoma.

P 3

A man with hearing loss and progressive unsteady gait due to superficial siderosis

LY Wong
Department of Medicine, North District Hospital, Hong Kong SAR

A 69-year-old man presented with a 3-year history of progressive unsteady gait with frequent falls and hearing impairment. He had a medical history of hypertension, hyperlipidaemia, and hepatitis C carrier. On physical examination, he demonstrated generalised brisk jerks and gait ataxia, with full limbs power but no obvious limbs ataxia or nystagmus. He had severe bilateral hearing impairment and could only communicate with writing. Sphincter was also involved with acute retention of urine. Magnetic resonance imaging (MRI) of the brain showed T2 and SWI hypointense signal around brainstem, cerebellum, temporal lobe, and sylvian fissure, which was likely due to hemosiderin deposition. Computed tomographic cerebral angiogram was pending. The final diagnosis of superficial siderosis was made based on the clinical features and typical MRI findings. Superficial siderosis is a rare neurological disease of central nervous system. It is caused by hemosiderin deposition in the leptomeninges secondary to haemorrhage in the subarachnoid space (secondary to aneurysms or cavernous haemangioma). The most common presentation is sensorineural hearing loss, followed by gait ataxia. Other presentations include pyramidal signs, bladder disturbances, anosmia, and dementia. Typical MRI features are T2 hypointense signal (hemosiderin deposition) around brainstem and cerebellum. Currently there is no effective treatment to reverse the neurological deficits, but some prospective studies demonstrated that deferiprone, an iron chelator, can reduce hemosiderin deposition and stabilise the disease progression.

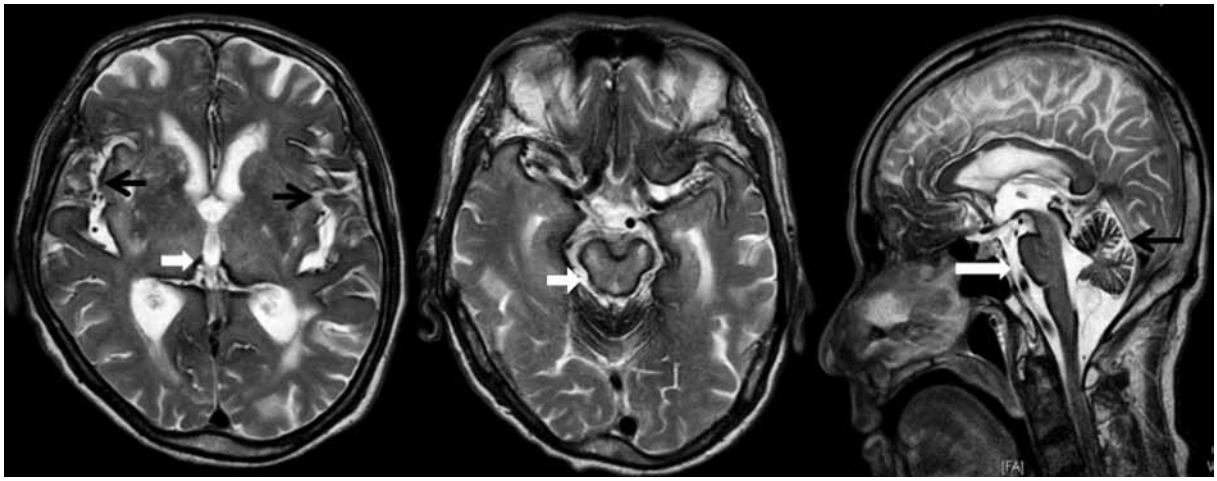

FIG. (a and b) Axial T2-weighted MRI slices showing hemosiderin deposition over meningeal surfaces of basal cistern (white arrow), sylvian fissures (black arrows), and around brainstem (white arrow). (c) Sagittal T2-weighted MRI slice showing hemosiderin deposition around brainstem (white arrow) and meningeal surface of brainstem (black arrow).

AUTHOR INDEX

WE'RE FIGHTING BACK WITH GILENYA,

the only once-a-day pill* that reduced the number of relapses by 52% in a 1-year study vs Interferon beta-1a[1] and by 54% in a 2-year study vs placebo.[2]

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Important note: Before prescribing, consult full prescribing information. **Presentation:** 0.5 mg hard capsules **Indications:** Gilenya is indicated as single disease modifying therapy in highly active relapsing remitting multiple sclerosis for the following adult patient groups: 1) Patients with high disease activity despite treatment with at least one disease modifying therapy. These patients may be defined as those who have failed to respond to a full and adequate course (normally at least one year of treatment) of at least one disease modifying therapy. Patients should have had at least 1 relapse in the previous year while on therapy, and have at least 9 T2-hyperintense lesions in cranial MRI or at least 1 Gadolinium-enhancing lesion. A "non-responder" could also be defined as a patient with an unchanged or increased relapse rate or ongoing severe relapses, as compared to the previous year. or 2) Patients with rapidly evolving severe relapsing remitting multiple sclerosis defined by 2 or more disabling relapses in one year, and with 1 or more Gadolinium enhancing lesions on brain MRI or a significant increase in T2 lesion load as compared to a previous recent MRI. **Dosage: Adults:** One 0.5 mg capsule taken orally once daily. **Children and adolescents:** Not intended for use (not studied in this population). **Special patient populations:** No dosage adjustment needed for patients with mild to severe renal impairment and mild to moderate hepatic impairment. Caution in elderly patients, patients with mild or moderate hepatic impairment and patients with concomitant diabetes mellitus. **Contraindications:** Known immunodeficiency syndrome. Patients with increased risk for opportunistic infections, including immunocompromised patients (including those currently receiving immunosuppressive therapies or those immunocompromised by prior therapies). Severe active infections, active chronic infections (hepatitis, tuberculosis). Known active malignancies. Severe liver impairment (Child-Pugh class C). Hypersensitivity to the active substance or to any of the excipients. **Warnings/Precautions:** ECG to be performed in all patients prior to the first dose and at the end of the 6-hour first-dose observation period. Heart rate and blood pressure to be monitored hourly during the 6-hour observation period. Same recommendation applies after an interruption of one day or more during the first 2 weeks of treatment, or for more than 7 days during week 3 and 4 of treatment; or after an interruption for more than 2 weeks after the first month of treatment. If post-dose bradyarrhythmia-related symptoms occur, or new onset of second-degree or higher grade atrioventricular (AV) block, or the heart rate at 6 hours post-dose is the lowest value post-dose or is <45 bpm, the patient should be observed until the symptoms or findings have resolved, and appropriate management should be initiated as necessary. Patients should be monitored overnight if ECG at 6 hours shows QTc ≥500 msec. If a patient requires pharmacological intervention during the first dose observation period, overnight monitoring should be instituted and the first dose monitoring strategy should be repeated for the second dose of Gilenya. ♦Gilenya should not be used in patients with second degree or higher AV block, sick-sinus syndrome or sino-atrial heart block due to the risk of serious cardiac rhythm disturbances. Gilenya should also not be used in patients with known ischemic heart disease, history of myocardial infarction, congestive heart failure, history of cardiac arrest, cerebrovascular disease, uncontrolled hypertension or severe untreated sleep apnea, since significant bradycardia may not be well tolerated in these patients.♦Gilenya should not be used in patients with significant QT prolongation (QTc >470 msec (women) or >450 msec (men)) or in patients with relevant risk factors for QT prolongation (e.g. hypokalemia or congenital QT prolongation). ♦In patients with a history of recurrent syncope or symptomatic bradycardia, use of Gilenya should be based on an overall benefit-risk assessment. ♦If treatment is being considered in patients with the aforementioned risk factors, pre-treatment consultation with a cardiologist is required to determine the most appropriate monitoring (should last overnight) for treatment initiation. ♦Gilenya should generally not be initiated in patients on concurrent therapy with beta-blockers, heart rate lowering calcium channel blockers or other substances that may decrease heart rate (limited experience is available and this may be associated with severe bradycardia and heart block). If treatment with Gilenya is being considered, advice should be sought from a cardiologist regarding switching to a non-heart rate lowering drug or appropriate monitoring (should last overnight) for treatment initiation. ♦After the first dose, the heart rate decrease starts within an hour and is maximal within 6 hours. Heart rate returns to baseline within 1 month of chronic dosing. ♦Anti-neoplastic, immunomodulatory or immunosuppressive therapies should not be co-administered due to the risk of additive immune system effects.Specific decisions as to the dosage and duration of treatment with corticosteroids should be based on clinical judgment. ♦Patients without a healthcare professional confirmed history of chickenpox or without vaccination against varicella zoster virus (VZV) should be tested for antibodies to VZV prior to treatment initiation. VZV vaccination is recommended in antibody-negative patients and initiation of treatment should be postponed for 1 month to allow the vaccination to take full effect. ♦Infection: Lymphocyte count is decreased during Gilenya therapy and up to 2 months after stopping Gilenya therapy. Before initiating treatment with Gilenya, a recent complete blood count (i.e. within 6 months or after discontinuation of prior therapy) should be available. Initiation of treatment with Gilenya should be delayed in patients with severe active infection until resolution. Effective diagnostic and therapeutic strategies should be used in patients with symptoms of infection while on therapy and up to two months after discontinuation. Consider discontinuing therapy if a serious infection develops, and re-evaluate benefit-risk before restarting therapy. Cases of cryptococcal meningitis have been reported in the post-marketing setting after approximately 2-3 years of treatment, although an exact relationship with the duration of treatment is unknown. Patients with symptoms and signs consistent with cryptococcal meningitis should undergo prompt diagnostic evaluation. If diagnosed, fingolimod should be suspended and appropriate treatment should be initiated. A multidisciplinary consultation (i.e. infectious disease specialist) should be undertaken if re-initiation of fingolimod is warranted. ♦Macular edema: Patients with history of uveitis and patients with diabetes mellitus are particularly at risk of developing macular edema. An ophthalmic examination is recommended 3 to 4 months after Gilenya therapy initiation and also before and regularly during Gilenya therapy in patients at risk. Discontinuing therapy should be considered if macular edema develops. ♦Recent (i.e. within last 6 months) transaminase and bilirubin levels should be available before initiation of treatment with Gilenya. A liver function test is recommended in patients who develop symptoms of hepatic dysfunction. Therapy should be discontinued if significant liver injury is confirmed. ♦Posterior reversible encephalopathy syndrome (PRES): Discontinue Gilenya treatment, if PRES is suspected. ♦Caution is required when switching patients from natalizumab or teriflunomide to Gilenya due to the long half-life of natalizumab or teriflunomide. Initiating treatment with Gilenya after alemtuzumab is not recommended unless the benefits clearly outweigh the risks. ♦Very rare cases of T-wave inversion have been reported in patients treated with fingolimod. In case of T-wave inversion, the prescriber should ensure that there are no associated myocardial ischaemia signs or symptoms. If myocardial ischaemia is suspected, it is recommended to seek advice from a cardiologist. ♦Cases of progressive multifocal leukoencephalopathy (PML) have been reported in the post-marketing setting. Cases of PML have occurred after approximately 2-3 years of treatment, although an exact relationship with the duration of treatment is unknown. Additional PML cases have occurred in patients who had been treated previously with natalizumab, which has a known association with PML. Vigilance for clinical symptoms or MRI findings suggestive of PML is warranted. If PML is suspected, Gilenya treatment should be suspended until PML has been excluded. ♦Basal cell carcinoma (BCC) has been reported in patients receiving Gilenya. Vigilance for skin lesions is warranted. **Pregnancy:** Not recommended. Adequate contraceptive measures are recommended in women of childbearing potential. **Breast-feeding:** Not recommended. **Interactions:** Concomitant use is not recommended with Class Ia (e.g. quinidine, disopyramide) and Class III (e.g. amiodarone, sotalol) anti-arrhythmic drugs. ♦At treatment initiation concomitant use with beta-blockers, heart rate lowering calcium channel blockers (e.g. verapamil or diltiazem) or other drugs that may lower heart rate (e.g. digoxin or ivabradine) is not recommended. ♦Caution is required in concomitant use with anti-neoplastic, immune-modulating or immunosuppressive therapies (including corticosteroids) during, and for up to 2 months after stopping Gilenya treatment. ♦Caution is required when switching therapy from drugs with a long-acting immune effect such as natalizumab, teriflunomide or mitoxantrone. ♦Concomitant use is not recommended with live attenuated vaccines; other vaccines may have reduced efficiency during and for up to 2 months after stopping Gilenya therapy. **Adverse reactions: Very common (≥10%):** Influenza, sinusitis, headache, cough, diarrhea, back pain, hepatic enzymes increased. **Common (≥1 to <10%):** Herpes viral infections, bronchitis, tinea versicolor, lymphopenia, leucopenia, basal cell carcinoma, depression, dizziness, migraine, vision blurred, bradycardia, atrioventricular block, hypertension, dyspnea, eczema, alopecia, pruritus, asthenia, blood triglycerides increased. **Uncommon (≥0.1 to <1%):** Pneumonia, depressed mood, macular edema, nausea, neutrophil count decreased **Rare (≥0.01 to <0.1%):** Lymphoma, posterior reversible encephalopathy syndrome. **Very rare (<0.01%):** T-wave inversion. **Not known (cannot be estimated from the available data):** Progressive multifocal leukoencephalopathy (PML), cryptococcal infections, peripheral oedema, hypersensitivity reactions (including rash, urticaria and angioedema upon treatment initiation), **Packs and prices:** 28's **Legal classification:** P1S1S3 (EMA Mar2016 (+CDS0827s))

Reference:
1. Cohen J, et al. Oral Fingolimod or Intramuscular Interferon for Relapsing Multiple Sclerosis, N Engl J Med 2010;362(5):402-15.
2. Kappos L, et al. A Placebo-Controlled Trial of Oral Fingolimod in Relapsing Multiple Sclerosis, N Engl J Med. 2010;362(5):387-401.

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