neurotropic effects leading to encephalitis, meningitis, myelitis and myositis (2) indirect effects due to metabolic complications resulting in encephalopathy and cerebrovascular complications due to thrombocytopenia and platelet dysfunction and (3) postinfectious immune-mediated acute disseminated encephalomyelitis, Guillain Barré syndrome and optic neuritis.
Material and methods: This was a descriptive cross sectional study including seropositive patients diagnosed with Dengue fever (DF), Dengue with warning signs and Severe Dengue with neurological manifestations presenting to Medicine Department of LLR Hospital, Kanpur.
Results: 10 (2.6%) patients had neurological manifestations out of 383 seropositive patients. Out of ten, nine patients were male and only one patient was female. Among them 10% patients come under category of classical dengue fever, 10% patients suffered from dengue with warning signs and 80% with severe dengue .4 patients had encephalopathy,3 other patients had encephalitis, 2 patients presented with single episode of symptomatic generalized seizure and 1 patient presented as having an intra cranial hemorrhage.
Conclusions: Neurological manifestations of dengue are manifold and it is necessary to consider dengue as a cause for the above neurological presentations in endemic zones of the disease.

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CNS Infections 1
Safflower yellow inhibits the inflammatory response and regulates microglial polarization in LPS-stimulated bv2 cells

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Background: Safflor Yellow (SY), the main active constituent of the traditional Chinese medicine Safflower, is known as a neuroprotective agent that indirectly attenuates neuroinflammation. Macrophage/microglia have different phenotypic and functional states, M1 is associated with inflammatory responses, while M2 results in anti-inflammatory effects.
Objective: The purpose of this study is to discover the effect of SY on anti-inflammation and polarization of microglia stimulated with LPS as well as related molecular mechanism.
Material and methods: BV-2 microglial cell line was treated with LPS and/or SY. Molecular biological technique, flow cytometry, and immunohistochemistry were adopted.
Results: LPS-stimulated BV2 cells upregulated the expression of TLR4 ($p < 0.01$), Myd88 ($p < 0.01$), p-NF-κB ($p < 0.05$), p-P38 ($p < 0.01$) and p-JNK ($p < 0.001$), and the expression of inflammatory cytokines IL-1β ($p < 0.05$),IL-6 ($p < 0.05$),TNF-a ($p < 0.05$),NO ($p < 0.01$) and COX-2 ($p < 0.05$), but didn't influence the expression of p-ERK ($p > 0.05$). After SY stimulation, the expression of TLR4, Myd88, p-NF-κB and p-P38, and inflammatory cytokines declined ($p < 0.05$). Simultaneously, M1 markers iNOS ($p < 0.05$), CD16/32 ($p < 0.05$), IL-12 ($p < 0.05$) and M2 markers CD206 ($p < 0.05$), IL-10 ($p < 0.05$) were elevated after LPS stimulation, but M1 markers significantly declined after SY intervention ($p < 0.05$), while M2 marker CD206 ($p < 0.05$) and IL-10 ($p < 0.05$) were significantly elevated ($p < 0.001$). SY had no influence on M2 marker Arg-1, but the ratio of iNOS/Arg-1 declined compared with LPS-stimulated group ($p < 0.05$), indicating SY converted inflammatory M1 BV2 cells toward anti-inflammatory M2 microglia.
Conclusion: SY exhibited anti-inflammatory effect on BV2 microglia possibly through TLR-4/NF-κB/MAPK signaling pathways and the conversion of M1 to M2 microglia. (Grant: The 2011 Cultivation Project of Shanxi University of Traditional Chinese Medicine, 2011PY-1).

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CNS Infections 1
Rabies virus phosphoprotein induces mitochondrial dysfunction, oxidative stress, and neuronal process degeneration: Implications for future therapy of human rabies

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Background: Our previous studies in a mouse model of experimental rabies showed neuronal process (dendrites and axons) degeneration in association with severe clinical disease. Cultured adult rodent (mouse and rat) dorsal root ganglion neurons infected with the challenge virus standard-11 (CVS) strain of rabies virus (RABV) showed axonal swellings and reduced axonal growth with evidence of oxidative stress. We have shown that CVS infection alters a variety of mitochondrial parameters and increases mitochondrial Complex I activity and reactive oxygen species (ROS) production.
Objective: To understand basic mechanisms important in rabies pathogenesis.
Materials and methods: We have studied interactions of the RABV and Complex I using immunoblotting, immunoprecipitation, and immunofluorescence. We have expressed rabies virus proteins in cells after transfection of plasmids, including alanine mutagenesis of the RABV phosphoprotein (P), and evaluated Complex I activity and ROS generation.
Results: RABV P was detected by immunoblotting in RABV-infected purified mitochondrial extracts and in Complex I immunoprecipitates from the extracts. A plasmid expressing P in cells increased Complex I activity and increased ROS generation, whereas expression of other RABV proteins did not. Expression of a peptide from amino acid 139–172 of the P increased Complex I activity and ROS generation similar to expression of the entire P protein. Mutational analysis suggests particular importance of the 157 to 169 region of P.
Conclusion: Rabies virus infection is a mitochondrial disorder initiated by interaction of the RABV P and Complex I. This information will be important for the future development of novel therapies for rabies.

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CNS Infections 1
Neurological manifestations among patients with HIV — Active tuberculosis coinfection, Sudan 2014

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Introduction: At least one-third of the 35.3 million people living with HIV worldwide are infected with latent tuberculosis. Tuberculosis is the most common presenting illness among people living with HIV, including those who are taking antiretroviral treatment. There were an estimated 1.1 million HIV positive new TB cases globally in 2012. Around 75% of these people live in sub-Saharan Africa. Despite its great burden, neurological manifestations in patients with HIV-active tuberculosis did not receive enough attention.
Objectives: To study neurological manifestations in patients with HIV-active tuberculosis.
Methodology: A case series study of 58 consecutive patients with laboratory confirmed HIV-active tuberculosis coinfection attending tertiary hospital for tuberculosis treatment was conducted. Data about neurological symptoms and signs – conducted by a neurologist- were collected from each patient. Patients' approval was obtained.
Results: 24% of 58 patients were found to have neurological manifestations in clinical assessment. This table demonstrates the neurological manifestations and their frequency.
Conclusion: The frequency of neurological manifestations among patients with HIV-active TB coinfection was found to be higher compared to that of patients with HIV only; 20% (Wadia et al., 2001).

Neurological diagnosis	Frequency	Percent
Normal	44	76.1%
AIDS dementia	3	5.2%
Meningitis	2	3.4%
Grand mal epilepsy	2	3.4%
Cerebellar ataxia	1	1.7%
GBS	1	1.7%
Peripheral neuropathy	1	1.7%
Proximal weakness	1	1.7%
Spastic quadriplegia	1	1.7%
Stroke	1	1.7%
Transverse myelitis	1	1.7%
Total	58	100%

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WFN15-0424
CNS Infections 1
Cryptococcal meningitis in a large cohort from India

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Background and objective: Cryptococcal meningitis is an important and a fatal neuroinfection. Early diagnosis and treatment is of utmost importance in reducing morbidity and mortality.
Methodology: Data of patients with laboratory confirmed cryptococcal meningitis seen over 13 years in the tertiary care hospital were reviewed. Details of demographic profile, clinical data, laboratory parameters, complications and in-hospital mortality were studied.
Results: There were 97 patients with cryptococcal meningitis (79 men, 18 women) of whom 88 were HIV positive, one was diabetic and 8 were sporadic. Their age ranged from 23 to 67 years (39.16 ± 9.49). Additional pathogens for meningitis were identified in 24 patients. Headache was the most common symptom (91%) followed by fever (66%), vomiting (51%), altered sensorium (31%) and seizures (20%). Neurological deficits included cranial nerve palsies (28), motor deficits (11), sphincter disturbances (5) and sensory involvement in 4 patients. Antifungal treatment consisted of amphotericin (78), fluconazole (16) and voriconazole (1). Two did not receive treatment. Complications included renal dysfunction (20%), dyselectrolytemia (20%), seizures (16%), hypersensitivity (7%) and hepatic dysfunction (5%). Favorable outcome was seen in 72 patients; 13 remained unchanged and 12 died. Rapid clinical progression, low CSF cell count and low CSF were associated with higher mortality. CSF cell count and protein were lower in patients who had isolated cryptococcal meningitis compared to those with additional tubercular meningitis. Mean sugar levels were higher and duration of illness was shorter in HIV negative individuals.
Conclusion: Cryptococcal meningitis is common in patients with AIDS. Effective and early antifungal treatment carries good prognosis. Shorter duration of illness, decreased CSF cell count and protein herald poor prognosis and warrants initiation of early specific treatment.

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CNS Infections 1
Does electroencephlography help in early diagnosis of subacute sclerosing panencephalitis

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Background: Subacute sclerosing panencephalitis (SSPE) is a chronic degenerative disorder of invariably fatal outcome.
Objective: To find out the role of electroencephalography in the early diagnosis of subacute sclerosing panencephalitis. It was a cross sectional observational study.
Material & methods: After IRB approval, it was started at Department of Neurology Children's Hospital, Lahore from April 15, 2006 to September 15, 2014. Children between the ages of 2 to 18 years ($n = 129$) with myoclonic jerks were admitted in Neurology department. History and clinical examination was carried out and EEG and CSF antimeasles antibodies were performed. Children may have EEG findings consistent with SSPE (EEG abnormalities having burst suppression in high amplitude slow and sharp waves recur at 3–5 second interval on slow background) or other EEG findings like myoclonic epilepsy with normal back ground, normal EEG etc. CSF of all children was sent for antimeasles antibodies for further confirmation which was considered diagnostic. Brain imaging was done in all children to exclude other possible diagnosis.
Results: Total of 89 patients with EEG findings of subacute sclerosing panencephalitis were further confirmed with CSF anti measles antibodies. It was positive in 77 children, while 12 children had negative EEG findings and all of them had negative results for CSF antimeasles antibodies. Male to female ratio was 1.4:1.
Conclusion: Subacute sclerosing panencephalitis is not an uncommon entity in our population with quite variable clinical presentation and electroencephalography has significant valve in early, cost effective and reliable diagnosis.

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