SHIFT 3 - MS & DEMYELINATING DISEASES

Home-based monitoring system with wireless sensors that confirm stable balance and motor function readings during remission is feasible for patients with multiple sclerosis

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Background: Multiple sclerosis (MS) is the most common cause of disability in young age. Current MS treatments demonstrate excellent efficacy in reducing MS relapses. Home-based monitoring system that can confirm stability of neurological signs during remission for MS specialists following Persons with MS (PwMS) could be a valuable source of information enabling high quality care combined with reduced costs.

Objective: To develop a simple and cheap system for home-based monitoring of PwMS.

Patients and Methods/Material and Methods: Wireless sensor system (WSS) measuring movement patterns with original software and mobile phone application was developed for home-based use of PwMS. Clinically meaningful and reproducible test battery included balance tests eyes open and closed. The strength of legs was evaluated by measuring angle and speed of leg movements. Baseline data for each individual PwMS for future measurements was calculated individually. Stability of measurements during repeated testing during one day and before and after extreme fatigue were performed.

Results: Stability of measurements during one day was evaluated on 56 PwMS. 47/56 repeated measurements demonstrated change within 15% of the first measurement on eyes open tests and 37/41 on eyes closed tests. The influence of fatigue on WSS measurements was evaluated on 24 patients. After subjective feeling of extreme fatigue 11/24 patients demonstrated change of 2 or more standard deviations from first 5 tests. 11 patients participated in the pilot study for home-based monitoring that confirmed feasibility of the system.

Conclusion: Our study demonstrates feasibility of WSS for home-based monitoring where baseline data are individual and subsequent readings compare results with baseline data of PwMS.

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A case of multiple sclerosis mimicking an intracranial mass lesion complicated with obstructive hydrocephalus and brainstem compression

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Background: Tumefactive multiple sclerosis (tMS) is a rare form of MS which is characterized by large, swollen brain lesions that demonstrates tumor-like features on MRI.

Objective: We present a case of tMS complicated with obstructive hydrocephalus and brainstem compression which are very rarely seen.

Patients and Methods/Material and Methods: Twenty five years old male was brought to the emergency department with suddenly developing dizziness, loss of balance and vomiting. He was conscious. His orientation and cooperation was assessed as normal. He had horizontal nystagmus with right gaze, dysarthric speech and ataxia of the trunk with tendency to fall towards the right with mildly left-sided weakness. Both optic nerves swollen without significant hemorrhage or exudate. No respiratory abnormalities were observed. Laboratory findings were normal. The MRI showed an intra-axial, infiltrative, mass localized in the vermis with extension to left cerebellar hemisphere, left superior cerebellar peduncle and brainstem. The lesion was isointense in T1-weighted images, hyperintense in T2-weighted images, showing enhancement after paramagnetic contrast administration. The lesion compressed the fourth ventricle, and caused hydrocephalus. Brain MRI also demonstrated multiple oval-shaped and variable-sized high-intensity lesions in the white matter of bilateral cerebral hemispheres on T2-weighted sequence. The lesions appeared hypointense on T1-weighted sequence (Figure 1a, 1b, 1c).

Results: He was treated with high dose methylprednisolone (1000 mg/day for 10 days) therapy. After one month of prednisolone treatment a follow-up MRI showed a marked decrease in edema, mass-effect, and normalization of ventricular size (Figure 2a, 2b).

Conclusion: Physicians should bear in mind that tMS lesions may resemble intracranial mass lesions.

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