EDITOR'S PAGE

Studies on protection against ischemia reperfusion injury after SCI

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This April issue starts with a Review on measured and predicted resting energy needs in adults after SCI. Nevin *et al.* underline that accurate estimation of energy needs is vital for effective nutritional management. Inappropriate energy prescription can compound rates of malnutrition or obesity, increase risk of complications and negatively influence outcomes.

Animal studies: Spinal cord ischemia-reperfusion (I-R) can result in debilitating injuries to the central nervous system, including immediate or delayed paraplegia. The mechanisms behind the paralysis and its possible prevention have been studied by several groups. In case of an acute SCI pharmacological interventions and hypothermia would seem to be clinically the best applicable. It is generally believed that leakage of the blood spinal cord barrier plays a crucial role in I-R injury, inducing spinal cord edema, which can damage the spinal cord again. Ischemic preconditioning has been reported to minimize such I-R injury. Improving local spinal cord blood flow and tissue oxygenation, enhancing the binding profile of heat shock proteins and suppression of apoptosis have been described. *Spinal Cord* has published an extensive list of studies on this topic, showing the continuous expanding knowledge. The findings in animal research of Quan *et al.*, in this issue, show that PMX53, a C5aR antagonist, protects the spinal cord from I-R injury, probably via the inhibition of neutrophil activity, increased activated microglia and astrocyte. In previous issues and previous years several studies can be found: Savaş *et al.*¹ described how pentoxifylline reduced biochemical markers of I-R in rabbits. Erten *et al.*² studied a protective effect of melatonin as was also done by Aydemir *et al.*³ Kalkan *et al.* evaluated the effects of prophylactic zinc and melatonin⁴ and of iloprost and piracetam.⁵ Gong *et al.* found that Bosentan, an endothelin-A/-B dual receptor antagonist reduces neuronal apoptosis following I-R,⁶ with its action through vascular endothelial growth factor receptors⁷. Dong *et al.* studied the expression of C5a and its receptor following SCI-R injury⁸. Also in this issue Yan *et al.* describe how EGB761 administration during the acute phase post-SCI significantly reduced secondary injury-induced tissue necrosis and cell apoptosis and improved functional performance in rats. We look forward to receive more findings that explore if and how such protection can be of benefit when a SCI happens. Translational data to human SCI could become very worthwhile.

Demographics: Are given from a Mexican hospital (Rodriguez *et al.*), while McCaughey *et al.* give the changes over a 20 year period in Scotland.

Kinetics: Gil-Agudo *et al.* found that shoulder joint forces and moments increase after an intense propulsion task. In subjects with SCI, these increases centre on forces with less chance of producing sub acromial damage. No changes are produced in ultrasonography variables, whilst a poorer clinical and functional evaluation of the shoulder appears to be related to a thicker long axis biceps tendon. Yilmaz *et al.* demonstrated that SCI patients had a thinner knee cartilage compared with healthy individuals in ultrasonographic assessment. More than one hour daily standing/walking time may have a negative effect on the femoral cartilage thickness.

Outcome: How neurologic impairment can influence different functions is demonstrated by Zlatev *et al.* related to the use of bladder intermittent catheterization, by Rodrigues *et al.* on heart rate variability and fatigue. Citak *et al.* found single-dose radiation therapy in the treatment of shoulder heterotopic ossification due to SCI to be effective and reliable, but the risk of secondary side effects needs to be determined. Stillman *et al.* discovered in a long-term retrospective study that statins, a class of cholesterol lowering drugs, reduced all-cause mortality.

Data set, measures: are the subject of different manuscripts. Evaluation of validity of ISCI quality of life basic data set (Post *et al.*), development and evaluation of the 'Sitting Balance Measure' (Wadhwa *et al.*), rehabilitation goals against international Classification of Functioning, Disability and Health Core Set for SCI (Haas *et al.*), establishing of standard hospital performance measures for cervical spine trauma (Hoh *et al.*).

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- 6 Gong S, Peng L, Yan B, Dong Q, Seng Z, Wang W *et al.* Bosentan reduces neuronal apoptosis following spinal cord ischemic reperfusion injury. *Spinal Cord* 2014; **52**: 181–185.
- 7 Gong S, Seng Z, Wang W, Lv J, Dong Q, Yan B *et al.* Bosentan protects the spinal cord from ischemia reperfusion injury in rats through vascular endothelial growth factor receptors. *Spinal Cord* 2015; **53**: 19–23.
- 8 Dong Q, Sun L, Peng L, Yan B, Lv J, Wang G *et al.* Expression of C5a and its receptor following spinal cord ischemia reperfusion injury in the rat. *Spinal Cord* 2015; **53**: 581–584.