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EP-0250 [Spine and Peripheral Nerve » Basic Science]**The Effects of Smoking in the Perinatal Period and During Lactation on the Intervertebral Discs of Newborns**

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Aim: To evaluate histopathological effects of smoking before, during and after pregnancy on the intervertebral disc structure of the newborns in an experimental rat model.

Method: Seven adult female Wistar Albino rats were randomly allocated into 7 groups. Nicotine was intraperitoneally introduced to these rats in 6 groups before, during and after pregnancy, while rat in the control group received isotonic saline intraperitoneally. Fourteen newborns delivered by each rat were sacrificed at the end of 9 weeks after being breastfed for 3 weeks after birth. The vertebral columns of the sacrificed rats were removed en bloc and histopathological evaluation was performed on the intervertebral disc specimens. Histopathological alterations were noted and compared between groups.

Results: Ratio of proteoglycan amount exhibited significant difference between groups. Subjects in control group had predominantly mild amount of proteoglycans, while smoking before and during pregnancy as well as smoking before/during pregnancy and lactation resulted in deposition of severe amount of proteoglycans in IVD tissue. There was a statistically significant difference between groups with respect to the amount of fibrosis. In the control group, fibrosis was absent in the majority (78.6%) of subjects. Moderate degree of fibrosis was detected in groups with smoking during pregnancy, before and during pregnancy, during pregnancy and lactation as well as smoking before/during pregnancy and lactation.

Conclusion: Results of the current study imply that maternal smoking before and during pregnancy and in the lactation period may have deleterious effects on the intervertebral disc of the newborn. The duration of smoking and fertility period can influence the type and severity of these effects.

Keywords: Intervertebral disc, Degeneration, Nicotine, Smoking, Histopathology

EP-0251 [Spine and Peripheral Nerve » Basic Science]**Neuroprotective Effects of Epidural Electrical Stimulation in Spinal Cord Injury Model: Preliminary Results**

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Aim: To investigate neuroprotective effects of epidural electrical stimulation in rat spinal cord injury model.

Method: Thirty Wistar albino rats were divided randomly into three equal groups: Group 1: control-sham, Group 2: trauma, Group 3: trauma+treatment groups. In all groups, total T10-L2 laminectomy was performed. The spinal cord trauma was made by in Group 2 and group 3. The pulsed current electrical stimulation was given to group 3. Anode and cathode electrode with diameter of 2-3 mm was

implanted in the epidural space over the dorsal column at level T10 and L2. The connection side of the electrode were placed outside of the body through the cutaneous. The pulsed current electrical stimulation (5mV, pulse duration 0,1 msec, Frekans 40 Hz, 1-2 mA) was given to spinal cord daily for 15 days by Functional Electrical Stimulation device. Functional recovery of the hind limbs was assessed by the Basso, Beattie, and Bresnahan (BBB) locomotor scale. All animals were sacrificed and sent histology laboratory at 15th day.

Results: Electrical stimulation treated group (group 3) show increased functional recovery and clinical outcome when compared group 2.

Conclusion: Electrical stimulation provided that resulting in increased muscle force due to better muscle reinnervation. This study demonstrated that electrical stimulation increased clinical outcome in spinal cord injury when it was started early phase of injury. This results are preliminary results of study.

Keywords: Spinal cord, Injury, Electrical stimulation

EP-0252 [Spine and Peripheral Nerve » Basic Science]**Demineralized Bone Matrix (DBM) as a Bone Void Filler in Lumbar Interbody Fusion: A Prospective Pilot Study of Simultaneous DBM and Autologous Bone Grafts**

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Background: Solid bone fusion is an essential process in spinal stabilization surgery. Recently, as minimally invasive spinal surgeries have developed, a need of artificial bone substitutes such as demineralized bone matrix (DBM), has arisen. We investigated in vivo bone growth rate of DBM as a bone void filler compared to autologous bone grafts.

Method: From 2014 to 2015, 20 patients with spinal stenosis were included. A posterior lumbar interbody fusion using two cages and pedicle screw fixation was performed, and each cage was packed with autologous local bone or DBM. Clinical outcomes were assessed using the NRS and the Oswestry Disability Index (ODI), preoperatively and postoperatively. CT was performed 1 year after surgery and bone growth of each cage were analyzed by ImageJ software.

Results: Eighteen patients completed 1 year of follow-up, and the mean age was 56.4. Eleven patients had single level and 7 had two-level surgery. The mean back pain and leg pain NRS improved significantly. The mean ODI score also improved. Every cage packed with local autologous bone graft or DBM showed bone bridge formation. On the quantitative analysis of bone growth, autologous bone grafts showed significantly higher bone growth compared to DBM on both coronal and sagittal images ($p < 0.05$). Osteoporotic patients showed less bone growth on sagittal images.

Conclusion: Though DBM alone can induce favorable bone bridging in lumbar interbody fusion, it is still inferior to autologous bone grafts. Therefore, DBM is recommended as a bone graft extender rather than bone void filler, particularly in patients with osteoporosis.