finished a Phase 1–2 Clinical trial supporting MED Safety and efficacy to restore both end reconnection of the injured spinal cord. Following the rational of this therapy, and under compassionate use, was treated a hydrocephalus three years old child that had a hypertension accident following a blockage of his Ventriculoperitoneal Shunt. The patient was in vigil coma and permanent mechanical respiratory assistant. EEG was without electric activity.

Methods: To treat the patient were used autologous cryopreserved C, instead to BM MSC as was originally described. UCB MSC were expanded on a normal and irradiated MSC feeding layer in DMEM enriched with Insulin and Platelet Lysate supernatant. No xenogeneic proteins were used. ETC against brain cells were isolated from mother's peripheral blood and processed to obtain ETC against brain antigens [Cytotherapy. 2006; 8:196–201]. Autologous NPC were obtained as described in Cytotherapy paper. The patient received a UCB MSC implant by Intra artery infusion (both carotid and both vertebral arteries). A week later received IV infusion of ETC and two days later a NPC intra-artery infusion similar to UCB MSC. Wojta Therapy and Neurodevelopment stimulation plan was stablished.

Results: Six week later the patients recovered a minimal conscience status. The EEG recover significate electric activity and the mechanical respiratory assistance tarted on BPAP mode. Six month later Patient improved EEG registers as well as neurologic condition. He used only BPAP 2 hours every 12-hour daily period.

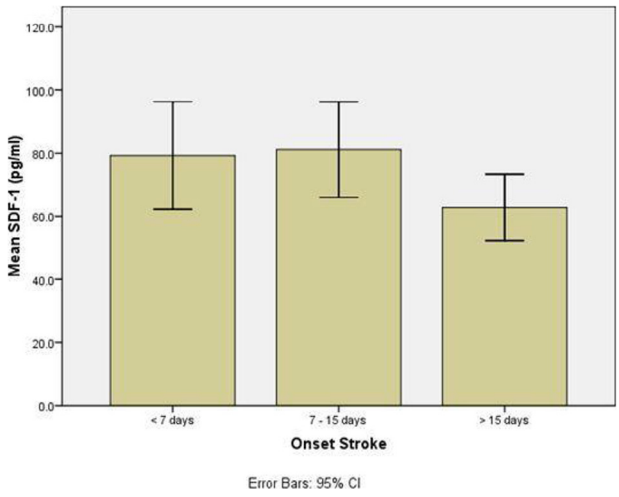

Figure 1 (Abstract 300). Time profile SDF-1 levels.

300

DYNAMIC OF CIRCULATING STEM CELLS IN ISCHEMIC STROKE PATIENT. STUDY OF HEMATOPOIETIC STEM CELLS (HSCS), MESENCHYMAL STEM CELLS (MSCS), NEURAL STEM CELLS (NSCS), ENDHOTELIAL PROGENITOR CELLS (EPCS), VERY SMALL EMBRYONIC (VSEL)

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Ischemic stroke remains a major health problem associated with high mortality and severe morbidity. The challenge of treatment is to understand the process leading to endogenous neurorepair mechanism to ischemic stroke. The aim of this study that Stromal Derived Factor (SDF)-1, Brain Derived Neurothropic Factor (BDNF) and stem cells population (Hematopoietic Stem Cells [HSCs], Mesenchymal Stem Cells [MSCs], Neural Stem Cells [NSCs], Endothelial Progenitor Cells [EPC], Very Small Embryonic-Like Stem Cells [VSEL]) have important roles in the process endogenous neurorepair in ischemic stroke patient. Studies indicated an decrease in SDF-1 and BDNF levels within one week of stroke in patient. Studies also indicated there are time profiles of stem cells after stroke. The findings indicated that SDF-1 could be key for mobilization of many populations of bone marrow derived stem cells as a response for stroke whereas BDNF might be the correlative response to prevent cell death.

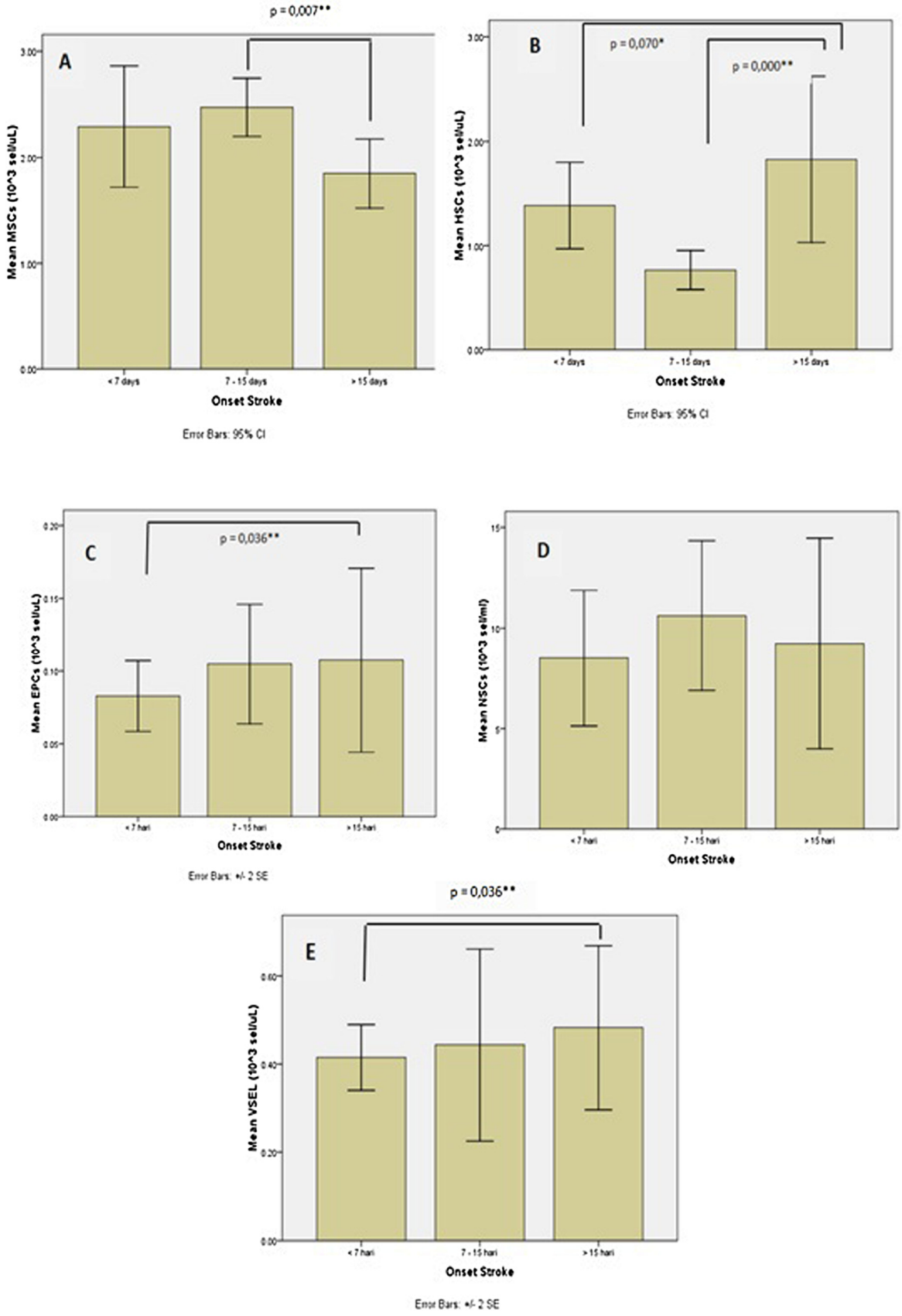

Figure 2 (Abstract 300). Time Profile of Stem Cells in Stroke Patient.

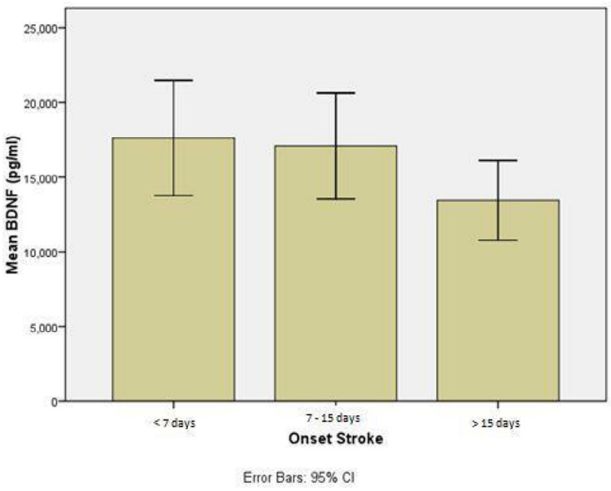

Figure 3 (Abstract 300). Time profile BDNF levels.

301
WILL NOT BE PRESENTED

302
WILL NOT BE PRESENTED

303
HUMAN MESENCHYMAL STEM CELLS PRIMED WITH A NOVEL COMPOUND CND-E ENHANCE THE SUPPRESSION OF MICROGLIAL ACTIVATION IN VITRO

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Alzheimer's disease (AD) is a neurodegenerative disease that is clinically characterized by progressive loss of cognitive function and behavioral disorders. The neuropathology of AD is complex and beta(β)-amyloid is reported to be involved in various mechanisms such as oxidative damage and inflammation. Through paracrine activity, mesenchymal stem cells (MSCs) exert beneficial effects such as reduction of amyloid burden, inflammation, and enhancement of endogenous neurogenesis. Identifying compounds that can regulate the proliferative characteristics of MSCs is crucial for MSCs to continually secrete protective factors in the brain. In the present study, with the objective of MSC priming, we screened a library of novel bioactive compounds. We identified a potential therapeutic compound, CND-E, that can accelerate the proliferation of human MSCs. After CND-E priming, MSCs exhibited a significant increase in proliferation (BrdU assay) and viability (ATP assay). A dose-dependent increase in cell proliferation was also observed. Compared to naïve MSCs, CND-E primed MSCs significantly attenuated levels of tumor necrosis factor alpha (TNFα) and interleukin-1beta (IL-1β) in lipopolysaccharide-activated BV2 microglial cells. Moreover, a downregulation of nitric oxide levels was also observed. The findings of the present study, thus, indicate that screening of compounds to prime MSCs prior to transplantation represents a promising strategy to improve the therapeutic benefits of cell therapy.

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CELL THERAPY OF COMBAT RELATED SPINAL CORD INJURY WITH USE OF ADULT NEURAL CREST-DERIVED MULTIPOTENT STEM CELLS

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Treatment of combat related spinal cord injury (SCI) accompanied by vertebral fracture remains actual clinical problem due to the nervous tissue spontaneous regeneration failure. In our clinical practice we applied the regenerative medicine methods with use of autologous cultured adult neural crest derived multipotent stem cells (NC-MSCs) for patients with combat related contusion-compression SCI and made the initial assessment of their safety and effectiveness (Bioethics Committee approval, patient informed consent).
Material and Methods: Three patients with bullet and shrapnel caused contusion-compression SCI were treated; to evaluate the treatment results MRI, SCT, electromyography and clinical methods have been used. Patients subjected to non-effective standard drug therapies/neurorehabilitation have received the cell therapy treatment (single combined paravertebral and intrathecal injections, 20×10^6 cells per injection). Follow-up period was 1 year. NC-MSCs were obtained from hair follicle by explant technique. Cultured NC-MSCs were characterized by RT-PCR, immunocytochemistry, flow cytometry and functional assay. Cytokines and growth factors production by NC-MSCs was determined by ELISA and Bio-Rad multiplex assay.
Results and Conclusions: Adult expanded NC-MSCs have stable karyotype (GTG-banding), $Sox2^+Sox10^+Nestin^+CD73^+CD90^+CD105^+CD140a^+CD140b^+CD166^+CD271^+CD349^+CD45^-HLA\text{-}DR^-$ phenotype and were able to self-renewal and directed differentiation *in vitro* into neurons, Schwann cells, melanocytes, osteoblasts, chondrocytes and adipocytes. NC-MSCs secreted following proteins: NGF, BDNF, NT-3, NT-4/5, IL-1ra, IL-10, bFGF, VEGF and GM-CSF. Two patients with lumbar SCI caused by shrapnel improved from ASIA C to ASIA D after cell therapy. One patient with thoracic SCI caused by bullet improved from ASIA B to ASIA C after treatment. Treated patients showed the restoration of sensitivity, as well as the emergence of active movements and strength growing in paretic limbs.

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TISSUE ENGINEERING-BASED APPROACH FOR RESTORATION OF COMBAT RELATED CRITICAL SIZED BONE DEFECTS

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Combat-related bone defects are manifested in 10-12% of casualties, and 30% of these defects are complicated with osteomyelitis. The greatest difficulties arise in the treatment of diaphyseal bone defects more than 5 cm and metaepiphyseal defects that exceed 15-20 cm^3. Our aim was to develop 3D tissue-engineered bone equivalent (3D-TEBE) transplantation technology for restoration of critical sized bone defects. Treatment was based on Bioethics' Commission positive opinion, local clinical protocol approved by Ministry of Health of Ukraine and patient's informed consent.
Material and Methods: To fabricate 3D-TEBE we used devitalized allogeneic bone (blocks and chips) seeded with cultured autologous cells:bone marrow mesenchymal stromal cells BM-MSCs in mix with periosteum progenitor cells (PPCs) and endothelial progenitor cells (EPCs). Quality/identity of cell cultures was assured by flow cytometry (cell phenotype), cytogenetic analysis (GTG-banding), donor and cell cultures infection screening (ELISA, PCR), functional analysis (cell kinetics, CFU analysis, multilineage differentiation assay, cell senescence assay). 3D-TEBE transplantation was performed in 47 combat-injured with 49 bone defects.
Results and Conclusions: Patients were included in a treatment program 8-19 months after injury, provided the ineffectiveness of conventional surgery methods. All cell cultures had a normal karyotype and phenotype, differentiation poten-