Journal of Vascular Medicine & Surgery

Perna, Vasc Med Surg 2016, 4:2
DOI: 10.4172/2329-6925.1000e117

Editorial Open Access

Editorial: Post-stroke Angiogenesis and Treatment Potential

Robert Perna*

The Institute of Rehabilitation Research, Houston, TX, USA

***Corresponding author:** Robert Perna, The Institute of Rehabilitation Research, RN, 5930 Kuldell Drive, Houston, Texas, USA, Tel: 706-750-2572; E-mail: dr.perna@juno.com

Received date: April 25, 2016, **Accepted date:** April 26, 2016, **Published date:** April 30, 2016

Editorial

Vascular science is progressing rapidly and current research methodologies are facilitating the testing of many potential treatments for vascular disease. One fascinating area of research with great potential for clinical implications is angiogenesis. It has long been observed that ischemia drives angiogenesis and this can be adaptive in promoting perfusion. Animal studies show that early post cerebral ischemia, angiogenesis genes are up regulated [1]. Angiogenesis may have great clinical potential if modifiable. For example, after stroke the effected brain region and long-term prognosis may be dependent on reinstitution of blood flow and potential angiogenesis [2]. Part of our current clinical challenge is to discern what variables and activities stimulate and modulate angiogenesis. Neo vascularization may be both adaptive and maladaptive so a thorough understanding of this process will be needed before clinical treatments can be fully developed. For example, evidence suggests that physical exercise [3] may induce slight hypoxia and thus stimulate angiogenesis; however, the details regarding which exercises, duration and intensity are not yet understood. Moreover, it is unclear if mental/cognitive exercise also stimulates these processes. In response to the ischemic injury vascular endothelial factors (VEGF) is released by endothelial cells and leads to angiogenesis and increased vascularization [4]. Many cytokines and growth factors have been shown to modulate VEGF gene expression. VEGF itself is up-regulated by other growth factors within hours of stroke and has a strong influence on growth of new blood vessels in the injured area of the brain [5]. Current research shows that various potential therapeutic interventions have the potential to stimulate cerebral angiogenesis [6]. Some research suggests that administration of exogenous Mesenchymal stem cells and various growth factors in an early post ischemic phase stimulate both angiogenesis and neurogenesis and lead to improved functional recovery after stroke. However vascular endothelial growth factor (VEGF) is a potent angiogenic factor for neuro vascularization and neurogenesis in ischemic injury and thus has great potential utility as therapy in stroke. We may be entering a time in medical history that may be laying the foundation for various new methods of treating cerebrovascular disease. It is likely that journals such as this will help foster the translational research that will be needed to facilitate much of the current cutting edge research into clinical treatments.

References

1. Hayashi T, Noshita N, Sugawara T, Chan PH (2003) Temporal profile of angiogenesis and expression of related genes in the brain after ischemia. Journal of Cerebral Blood Flow Metabolism 23: 166-180.
2. Font MA, Arboix A, Krupinski J (2010) Angiogenesis, neurogenesis and neuroplasticity in ischemic stroke. Curr Cardiol Rev 6: 238-244.
3. Berggren KL (2013) Exercise induced hypoxia, angiogenesis.
4. Ma Y, Zechariah A, Qu Y, Hermann DM (2012) Effects of vascular endothelial growth factor in ischemic stroke. J Neurosci Res 90: 1873-1882.
5. Ferrara N (2004) Vascular endothelial growth factor: basic science and clinical progress. Endocr Rev 25: 581-611.
6. Navaratna D, Guo S, Arai K, Lo EH (2009) Mechanisms and targets for angiogenic therapy after stroke. Cell Adh Migr 3: 216-223.