SCIENCEFORECAST
A digital science library

Letter to the Editor
Published: 23 Feb, 2018

Journal of Emergency Medicine Forecast

Resveratrol: Does Innovative Option for the Treatment of Mitochondrial Dysfunction among Trauma Hemorrhagic Shock?

Kumar M[1], Bhoi S[2] and Sharma K[2]*

[1]Department of Microbiology, Al-Falah School of Medical Science and Research Centre, Dhauj, Faridabad, Haryana, India

[2]Department of Emergency Medicine, JPNATC, AIIMS, New Delhi, India

Letter to the Editor

Hemorrhagic shock (HS) is the leading cause of mortality after trauma. Mortality due to HS is about 50%, condition with limited therapeutic option. Fluid, blood component and control of hemorrhage has been the cornerstone of management. Resuscitation with fluids and blood products induces reperfusion ischemia due to the production of reactive oxygen species and activation of immune cells [1].

HS induced inflammatory cytokines, mitochondrial dysfunction and increased endoplasmic reticulum stress with consequent decrease in organ function. HS and subsequent resuscitation cause mitochondrial dysfunction (MD). MD is also associated with dysregulation of immune system leading to sepsis and also contributes to MOF. MD following HS and resuscitation is associated with increased IL-6 levels. It also caused impaired ATP- linked respiration. MD is due to the loss of mitochondrial membrane potential (MMP). Loss of MMP leads to mitophagy (Mitochondrial autophagy) via to PINK1-Parkin pathway or it could lead to apoptosis [2,3].

Resveratrol acts as anti-inflammatory, antioxidant, anti-aging, anti-diabetic and anti-coagulative properties. It also controls cell cycle and apoptosis. In T/HS, resveratrol attenuated organ injury via multiple signalling pathways. Protective effect of resveratrol includes the activation of estrogen receptor, the regulation of the sirtuin 1 (SIRT1)/nuclear factor-kappa B (NF-κβ) and mitogen-activated protein kinases/hemeoxygenase-1 pathway. Resveratrol also reduces MD and hepatocyte injury induced by T/HS. Treatment with resveratrol changed the expression level of mitochondria-related transcription factors (Ppar-α and Tfam) leading to reduced MD dysfunction and maintained MMP. Ayub et al. showed that resveratrol prolonged life and improved survival after HS. It increases ATP level and reduces cytochrome c level through signalling pathway (SIRT1/NF-κβ) [3,4].

Therefore, the author feels that mitochondrial dysfunction may be reduced by resveratrol. Further studies are required to validate the finding in humans. This subject needs to be attended.

Authors´ Contributions

SB, MK and KS drafted the manuscript. All authors read and approved the final manuscript.

References

1. Bhoi S, Tiwari S, Kumar M. Estrogen: Is it a new therapeutic paradigm for trauma hemorrhagic shock? *Int J Crit Illn Inj Sci*. 2016; 6: 53.

2. Villarroel JP, Guan Y, Werlin E, Selak MA, Becker LB, Sims CA. Hemorrhagic shock and resuscitation are associated with peripheral blood mononuclear cell mitochondrial dysfunction and immunosuppression. *J Trauma Acute Care Surg*. 2013; 75: 24-31.

3. Ayub A, Poulose N, Raju R. Resveratrol Improves Survival and Prolongs Life Following Hemorrhagic Shock. *Mol Med*. 2015; 21: 305-312.

4. Liu FC, Tsai YF, Tsai HI, Yu HP. Anti-Inflammatory and Organ-Protective Effects of Resveratrol in Trauma-Hemorrhagic Injury. *Mediators Inflamm*. 2015; 2015: 643763.

OPEN ACCESS

*Correspondence:
Manoj Kumar, Department of Microbiology, Al-Falah School of Medical Science and Research Centre, Dhauj, Faridabad, Haryana, India.
Tel: 9654965259
E-mail: manojaiims84@gmail.com

Received Date: 02 Feb 2018
Accepted Date: 19 Feb 2018
Published Date: 23 Feb 2018

Citation: Kumar M, Bhoi S, Sharma K. Resveratrol: Does Innovative Option for the Treatment of Mitochondrial Dysfunction among Trauma Hemorrhagic Shock?. J Emerg Med Forecast. 2018; 1(1): 1005.

ISSN 2643-7856