Alok De, J Cancer Sci Ther 2017, 9:1(Suppl)
http://dx.doi.org/10.4172/1948-5956-C1-095

16th Global Annual Oncologists Meeting

Alok De

Kansas City VA Medical Center, USA

Anti-proliferative, anti-angiogenic and anti-metastatic effect of *Emblica officinalis* (Amla) on ovarian cancer cells via microRNA regulated and autophagy mechanisms

Ovarian cancer (OC), the most lethal gynecologic cancer, may be treated with surgery, chemotherapy and/or radiation therapy. None of these strategies are very effective. Recently, we have demonstrated that *Emblica officinalis* (Amla) extract (AE) has anti-neoplastic effect on OC cells *in vitro* and in mouse xenograft tumors. We hypothesized that anti-proliferative, anti-angiogenic and anti-metastatic effect of AE on OC cells via microRNA regulated and autophagy mechanism. The effects of AE on OC cells - OVCAR3, SKOV3, A2780cis and OC cells-derived mouse xenograft tumors were studied. The effect of AE on OC cells proliferation, migration and invasion was studied. Expression of - proangiogenic receptor- IGF1R, angiogenic marker- CD31, angiogenesis regulatory transcription factor- HIF-1α, metastasis-associated transcription factor- SNAIL1, adhesion protein- E-cadherin and autophagy proteins- beclin1 and LC3B-II in OC cells and mouse xenograft tumors were studied. Expression of microRNAs in OC cells and exosomes released from OC cells after AE treatment was studied. AE dose and time dependently inhibited cell proliferation, migration and invasiveness in OC cells. AE significantly reduced the expression of HIF-1α, IG1R, CD31and proliferating marker- Ki67 both *in vitro* and *in vivo*. AE reduced SNAIL1 and induced E-cadherin expression both *in vitro* and *in vivo*. AE significantly increased beclin1 and LC3B-II expression both *in vitro* and *in vivo*. AE significantly increased microRNA-375 expression in OC cells and in exosomes derived from OC cells. These studies suggest that AE inhibits OC cells growth via simultaneous activation of autophagy and miR-375, by targeting IGF1R, SNAIL1, down-regulating HIF-1α and inhibiting angiogenesis.

Biography

Alok De has received his PhD from University of Calcutta, India. He is a Research Biologist at VA Medical Center, Kansas City, USA. His research focuses on how to use extract of *Emblica officinalis* as an alternative or adjunct therapeutic agent in helping to fight ovarian cancer. He has published more than 46 papers in reputed journals and more than 75 abstracts. He has been serving as a Reviewer for many journals and as an Editorial Board Member of *Cancer Cell and Microenvironment* and co-chair of scientific conferences.

Alok.De@va.gov

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