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Angiogenesis Induced by Heparin and Quantitative Assessment of Angiogenic Response in Chorioallantoic Membrane

Sohail Ejaz, Hee Jin Park, Ji Sun Kim, Chae Woong Lim and Byung Moo Rim
Biosafety Research Institute, Chonbuk National University

The effects of heparin on angiogenesis are controversial, with some studies claiming stimulatory and other studies claiming inhibitory action. The aim of this study sought to delineate the effects of heparin on angiogenesis by using chorioallantoic membrane (CAM) assay. This work involves the implementation of histology, scanning electron microscopy (SEM) and computer-based approaches for precise quantification of angiogenesis, which are helpful in perceiving and locating angiogenesis. Different concentrations (30, 40, 50 and 60mg) of heparin soaked in methylcellulose disks were implanted on CAMs. Moderate to dramatic angiogenic response was observed in different treated groups as compare to control group. Histologically, mesoderm of heparin treated CAMs were thicker, containing significantly more fibroblasts and extracellular matrix. The SEM features of angiogenesis in response to heparin consist of reopening and activation of arcuate vascular networks and sprouting of tiny lateral vessels, which arise at distinct angles from their mother vessel. Computer based evaluation also revealed positive increase in angiogenesis among treated CAMs. This data confirmed that heparin stimulates angiogenesis and cancer progression can be influenced by the use of heparin among cancer patients.

Keyword : Angoigenesis, heparin, CAM