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Short Communication

Protective or Promotive Role of Inflammation and Cancer

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Inflammation is a defensive mechanism against noxious stimuli such as physical or chemical or thermal stimuli. In an acute inflammation recruitment of immune cells to the site of inflammation by chemokines. Inflammatory cells such as neutrophils, macrophages, mast cells, T and B cells release inflammatory mediators such as cytokines IL-1, TNF-α, TGF-β, IFN-γ and growth factors such as EGF, FGF, free radicals such as ROS, RNS, enzymes such as COX-2, Mmp's involved in repair of injured tissue results in resolution of inflammation. Free radicals such as ROS, RNS produced by neutrophils, macrophages, and mast cells initially at the time of acute inflammation will have antibacterial activity to reduce the inflammation and in chronic inflammation, free radicals will have tissue damage, DNA mutation and immunomodulation. IL-2, IL-12 and IFN-γ has immune stimulatory activity and IL-4, IL-5, IL-13 has immunomodulatory activity.

If the inflammation is aggravated, chronic, smoldering progressive, persistent inflammation results in release of inflammatory mediators such as such as IL-1, TNF-α, IL-6, EGF from chronic inflammatory cells activates NF-KB, a key transcription factor, dysregulated NF-KB transcription factor involved in tumor initiation, promotion, and progression by expression of inflammatory mediators involved in tumor progression such cell proliferation (Cyclin D, E), cell survival (BCL-2, BCL-XL), immunomodulation (IL-4, Il-5, IL-13), angiogenesis (IL-8, VEGF, COX-2), genomic instability (ROS, RNS, AID), invasion and metastasis (Mmp's2, 9 (Matrix metallo proteases), UPA (urokinase plasminogen activator).

IL-17 and IL-23 cytokines has tissue damage and immunomodulatory activity. STAT-3 transcription factor activated by growth factors such as EGF, FGF, IL-11, IL-10 and IL-23 involved in cell survival and cell proliferation. HIF-1α transcription factor in hypoxic environment involved in transcription of IL-8, VEGF, COX-2 factors, which are involved in angiogenesis. Chronic inflammation is one of the seventh hall mark of cancer accounts 25 percent of all cancer due to external environmental factors such as infectious agents such as HPV, EBV, noxious stimuli such as physical injury, psychological stress and chemical agents such as bismuth, arsenic, benzene, lead. Thorough understanding of acute and chronic inflammatory mediators their signaling pathways and its role in tumor protection and promotive action helps in future cancer prevention, therapeutic agents and prognostic markers.

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