

Co-Relation between Chronic Psychological Stress and Cancer

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Abstract

Cancer is a major threat to mankind. Majority of cancer more than 90 percent of all cancers are due to external environmental factors such as smoking or chewing form of tobacco, alcohol, chemicals ingestion, infectious agents such as HPV (Human papilloma virus), EBV (Ebsteinbarr virus). Chronic psychological stress is also one of the etiological factors of cancer. This article highlights about the research findings of co-relation between chronic psychological stress and cancer.

Keywords: HPA-Axis; NF-KB; STAT-3

Introduction

Chronic psychological stress, hatred, jealousy, anger, frustration, depression induced release of CRH (Corticotrophin releasing hormone) from hypothalamus activate HPA-axis (Hypothalamic pituitary axis) through ANS (Autonomic nervous system) release stress releasing hormones such as cortisol, ACTH, noradrenalin activate inflammatory mediators such as IL-1 β , TNF- α , COX-2 and IL-6 from inflammatory cells such as neutrophils, macrophages and mast cells, further activates NF-KB a key transcription factor and STAT-3 transcription factor [1-9]. Both NF-KB and STAT-3 transcription factors work together express inflammatory mediators involved in cell proliferation by activation of cyclin D, cyclin E cell cycle regulatory proteins, cell survival by BCL-2, BCL-XL anti-apoptotic proteins, angiogenesis by IL-8, COX-2, VEGF, genomic instability by ROS, RNS, iNOS, AID (Activation induced cytidine deaminase) enzyme, Immune suppression by IL-10, TGF- β , IL-4, IL-13, invasion and metastasis by UPA (Urokinase plasminogen activator), MMP's 2,9 (Matrix metalloproteinases 2,9) all these changes leads to tumor progression [5,10-16] (Figure 1).

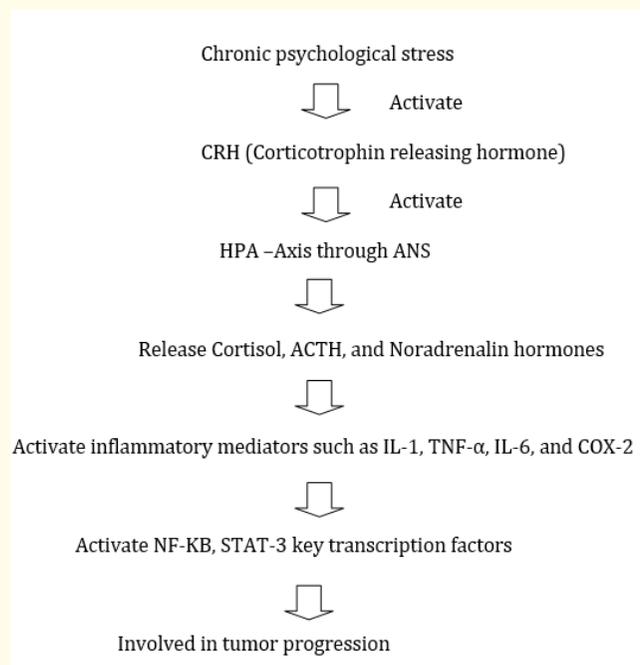


Figure 1: Shows the co-relation between chronic psychological stress and cancer.

Conclusion and Future Perspective

Chronic psychological stress is one of the neglected etiologies of cancer. Chronic psychological stress should be considered in overall management of cancer; it will improve the patient's survival rate. Chronic psychological stress induced neurohormones activate inflammatory mediators, which activate NF-KB and STAT-3 key transcriptional factors express inflammatory mediators induced tumor progression. Through understanding of chronic psychological stress and its releasing hormones and its mechanism of actions in tumor progression need to be studied for better management of patients.

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