

Angiogenic Inhibitors: Role In The Cancer Treatment

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Abstract

Angiogenesis is one of the basic important mechanisms for the tumor growth. Tumor cells produce these angiogenic molecules along with the antiangiogenic molecules as well. If exogenous introduction of the antiangiogenic substances, to the body, is done to balance over angiogenic molecules, tumor growth can be hampered or regressed even.

INTRODUCTION

No tumor would grow beyond 1 to 2 mm unless they were vascularized. Angiogenesis exerts a very important role in the development of the tumor. It not only supplies oxygen and nutrients to the cells, but carries away the metabolic wastes as well. Though not enough, angiogenesis is a necessary single most event for the tumor growth. So, almost all the tumors acquire an angiogenic phenotype through a common pathway for their progression. This precondition can be exploited in the treatment of cancers.

DISCUSSION

Tumor cells directly or indirectly produce certain angiogenic molecules (VEGF, bFGF) as well as antiangiogenic molecules (angiostatin, endostatin). Various studies have proved this. Both the types of molecules act in their own ways to induce or inhibit tumor angiogenesis. Tumor growth depends on the balance between these two factors. Usually, in many of the tumors, over a period of time, there is a mutational inactivation of antiangiogenic genes leading to favoring the balance to angiogenic factors. Finally the result is tumor growth. Balancing the antiangiogenic factors over angiogenic factors can lead to the inhibition of tumor growth and even regression.

A number of antiangiogenic factors have been discovered like angiostatin, endostatin. Even synthetic antiangiogenic factors have been produced. Recently large scale production of these factors is being tried on by various techniques like recombinant DNA technique. Antiangiogenic molecules are supposed to act through the up-regulation of apoptosis, down-regulation of endothelial cells proliferation or the combined actions. Various experimental animal studies have shown very promising results with angiostatin, endostatin in

the treatment of tumors and metastasis as well.

Antiangiogenic factors act on normal cells to inhibit new blood vessels formation, whereas conventional chemotherapeutic drugs act on tumor cells. Their repeated use leads to drug resistance via mutations. This is not seen with the antiangiogenic factors due to their selective effects. Even studies show that the use of more than one antiangiogenic factors produces synergetic effects. In trials these drugs don't seem to produce systemic toxicities.

So, in today's changing scenario of cancer treatment, we wish that this ray of hope turns up to give a fruitful life to those millions of people living a debilitating life.

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