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How long should adjuvant chemotherapy be given?

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Abstract

Adjuvant chemotherapy is used to reduce the probability of metastatic relapse. This is a very common therapy in oncology – used for almost all early stage breast and colon cancer patients of whom there will be 374,000 in 2013 in US. This therapy is not very effective since 91,000 patients will die of breast and colon cancer in 2013. Despite being used for decades, much work is needed to understand bioequivalence, bioavailability, biosimilars and biowaivers in medical oncology.

In May 2011, I discussed my personal use of low dose long term adjuvant chemotherapy for stage IIIc colon cancer in 1994-1996(1). This therapy is now known as metronomic chemotherapy. The question I now raise is: how long should adjuvant chemotherapy be used? If we assume first that cancer growth is well behaved i.e., all cancer cells in the tumor divide once and only once during a doubling time, and second that the chemotherapy drug used is 100% effective, i.e., it kills every cell that tries to divide, then therapy duration should be one doubling time. In the case of colon cancer that is 2-3 months. Based on my estimates of tumor behavior and drug (5-Fluorouracil), I calculated chemotherapy should ideally be used longer than 2 years so I used low dose therapy for 2.5 years. Nobody could tolerate a toxic protocol for over 2 years. In order to be effective for all or nearly all cases, adjuvant chemotherapy must be nontoxic and tolerable for over 2 years.

Biography

Michael Retsky completed his Ph.D in 1974 in Physics from University of Chicago. He is on the Board of Directors of Colon Cancer Alliance (www.ccalliance.org) and has a patent pending for treatment of early stage cancer. He is Co-PI of a $600k breast cancer grant from the Komen Foundation. He has published over 60 papers in the fields of physics and oncology, is editorial board member of a number of journals and has been guest editor for several special issues. He is on honorary faculty at University College London and on staff at Harvard School of Public Health.