



Case Report

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Proposed biology of the spontaneous remission of cancer (Respiratory alkalosis and rapid malignant growth)

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Abstract

It is suggested that Spontaneous remission of cancer may occur when two conditions are met. A low blood oxygen and a rapid or steady growth of a primary tumor just prior to the spontaneous remission of cancer [1, 2]. The implication being that remissions of cancer can be induced while inducing a rapid cancerous growth in the presence of low blood oxygen.

Keywords: Hypoxemia, respiratory alkalosis, inhibition of Lactate Dehydrogenase A, rapid malignant growth, remission

Introduction

Case reports of the spontaneous remission of cancer without medical intervention remains a mystery. A spontaneous disappearance of all signs and symptoms of cancer without medical intervention. Prior to the 1950's reports of the spontaneous remission of cancer were dismissed as a misdiagnosis. Dr. Everson and Dr. Cole published a book in 1966 documenting these reports. Afterwards the medical community recognized that a cancer growth may disappear spontaneously without any medical intervention. This paper suggests a biological mechanism for this phenomenon and its possible implication in treating cancer patients.

Method

Case reports of the spontaneous remission and regression of cancer in medical literature since the late 1800's was studied. The case reports of the spontaneous remission and regression of cancer were classified by the tissue type and events preceding the spontaneous remission or regression of cancer. Afterwards compared to one another. A common denominator among the case reports of the spontaneous remission and regression of cancer was sought. This is a continuous study taking over forty years. The first paper on this study was published in 1993 "steady tumor growth and the spontaneous disappearance of cancer; Journal of the national cancer institute 85(1):68-9"

Results

- (a) Spontaneous remission of cancer may occur more commonly after pneumonia (infection) (1), pulmonary edema (heart failure) (1), nephrectomy (1), pulmonary metastasis (1), severe hemorrhage (1) and after mechanical ventilation. all have in common low blood oxygen. low blood oxygen due to pulmonary disease or congestive heart failure or severe anemia may lead to hyperventilation and respiratory alkalosis.
- (b) a significant number of authors reporting case reports of the spontaneous remission of cancer have explicitly noted a rapid tumor growth just prior to the spontaneous remission of cancer particularly hepatocellular carcinoma (2). Rapid tumor growth just prior to the spontaneous remission of cancer may occur in different malignancies (3).

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- (c) It is noteworthy that some reports of the spontaneous remissions of cancer may be preceded by an infection and fever (4, 5) and termination of pregnancy (6,7). All have in common respiratory alkalosis. Pneumonia and sepsis can cause respiratory alkalosis. Pregnancy results in a rise in progesterone which can result in respiratory alkalosis. Fever can result in hyperventilation followed with respiratory alkalosis.

Discussion

One may speculate the biological mechanism of these spontaneous remissions of cancer due to a rapid tumor growth in the presence of low blood oxygen (8).

- a) Low blood oxygen may result in acute or chronic respiratory alkalosis. Alkalosis can result in a rise of extracellular PH (extracellular alkalosis). A rise in extracellular PH is followed with a drop in intracellular PH of cancer cells (Intracellular acidosis). Acute respiratory alkalosis can result in a transient drop of the intracellular PH of cancer cells. A drop in intracellular PH of cancer cells can inactivate the enzyme lactate dehydrogenase A. lactate dehydrogenase A is an important metabolic enzyme for cancer cells without which cancer cells may break down and become dysfunctional and being vulnerable to an immune response.
- b) Low blood oxygen may result in respiratory alkalosis (extracellular alkalosis). Extracellular alkalosis in turn results in the intracellular acidosis of cancer cells. Intracellular acidosis of cancer cells results in the inhibition of the enzyme lactate dehydrogenase A. lactate dehydrogenase A is the enzyme that catalyzes the conversion of pyruvate to lactate. With the inhibition of the enzyme lactate dehydrogenase A, pyruvate cannot be converted to lactate. With the absence of lactate tumor microenvironment cannot become acidic (lactate acidosis). Tumor acidic microenvironment aborts immune responses against the tumor (9-11). Absence of an acidic tumor microenvironment makes the tumor vulnerable to an immune response.
- c) When a malignant tumor is growing rapidly due to some stimuli during respiratory alkalosis, the malignant tumor is growing in a basic environment. Alkalosis is negating the acidic micro-environment which aborts immune responses against the malignant growth. Therefore, the malignant tumor becoming vulnerable to an immune response and possibly a spontaneous remission of cancer.
- d) An acidic tumor microenvironment is inductive to cancer growth and metastases. A basic tumor environment is inhibitive to cancer growth and metastases. Therefore, if a malignant tumor is growing rapidly due to some stimuli in a basic tumor environment it may become dysfunctional and become vulnerable to an immune response.
- e) Normal cells under normal conditions produce energy by oxidative phosphorylation. Once normal cells become exposed to hypoxic or anerobic conditions the production of energy by oxidative phosphorylation becomes disrupted. Afterwards, the cells turn to anaerobic glycolysis and Pyruvate is converted into lactate acid. The enzyme lactate dehydrogenase catalyzes this reaction

Cancer cells derive energy through aerobic glycolysis. It is suggested that possibly similar to normal cells, tumors cells that grow rapidly and aggressively and faced with the inhibition of the enzyme lactate dehydrogenase A may also turn to another form of metabolism such as oxidative phosphorylation. Thereby rendering the malignant growth dysfunctional and vulnerable to

an immune response. since aerobic glycolysis is what derives the tumor with its energy needs. Normal cells turn into another form of metabolism when resources are low. Cancer cells slow down or become stationary with low resources. It is suggested that cancer that have slowed down or have between stationary if induced to grow rapidly will possibly turn into another form of metabolism. Thereby rendering the cancer cell dysfunctional and vulnerable to an immune response.

A reverse of PH gradient is a hallmark of cancer metabolism, manifested as extracellular acidosis and intracellular alkalization. bicarbonate reverses PH gradients in tumors and does not affect the extracellular PH (PHe) of normal tissue.

An acidic tumor micro-environment is inductive to tumor growth, progression, and metastases. A basic Tumor microenvironment is inhibitive of tumor growth and metastases. Inducing a malignant tumor to grow while its PH gradient is reversed (intracellular acidosis and extracellular alkalosis) might be followed with a remission of cancer.

Furthermore, intracellular acidosis promotes apoptosis and intracellular alkalization promote proliferative processes. In previous years (12) it has been shown that tumor growth can be retarded by inducing intracellular acidosis, either by lactate dehydrogenase A inhibitors or protein pumps inhibitors.

In addition, a rise in extracellular PH (respiratory alkalosis) can activate dormant cancer cells due to the acidic conditions. Theses activated cancer cells may become inactivated due to intracellular acidosis.

The implication of the hypotheses is that if a primary tumor grows or induced to grow rapidly or steadily and faced with the inhibition of the lactate dehydrogenase A due to extracellular alkalosis then a remission of cancer may possibly occur (13). this is in the case of the malignant growth is not effecting a vital organ. protein pump inhibitors may slow down extrusion of intracellular proteins. Therefore, further enhancing intracellular acidosis and further inhibition of the enzyme lactate dehydrogenase A. lactate dehydrogenase A inhibitors may further inhibit lactate dehydrogenase A. A reduction of tumor markers can be indicative of the effectiveness of this procedure. A reduction in inflammatory markers may be indication of the effectiveness of this procedure. A low dose of Dexamethasone (0.75mg) prior to inducing alkalosis may enhance an immune response against the tumor.

It is suggested (a hypotheses) that if a malignant tumor is induced to grow rapidly while the tumor microenvironment is reversed from acidosis to alkalosis due to taking bicarbonate then a remission of cancer may possibly occur. the rise of blood PH due to bicarbonate being to the extent that extracellular alkalosis occurs followed by intracellular acidosis of cancer cells and the inhibition of the enzyme lactate dehydrogenase A. the suggestion made is based on the suggested mechanism for the spontaneous remissions of cancer.

Note

A researcher may reject the notion that spontaneous remissions of cancer maybe preceded by a rapid or a steady malignant growth. Since, tumor growth can be very dangerous how could they result in a remission. The answer is that a tumor growth may be discrete or continuous. A discrete tumor growth is a growth in phases. The tumor grows for a while and become stationary to adjust and start growing again. A continuous growth becomes inhibited at some point. At this point if the tumor is pushed to grow is the subject of this paper. This is in a case that the malignant growth is not effecting a vital organ.

Low blood oxygen may result in metabolic acidosis or respiratory alkalosis. Metabolic acidosis occurs due to cells

switching to anaerobic respiration and the production of lactic acid (hypoxia). Respiratory alkalosis occurs due hyperventilation caused by a low blood oxygen (hypoxemia).

Caution

This is a suggested hypotheses without experimental proof for its correctness

Medical supervision required for the experimental treatment monitoring of alkalosis and other parameters needed

Disclaimer

Always seek the advice of your physician or other qualified health care provider with any questions you may have regarding a medical condition. Never disregard professional medical advice or delay in seeking it because you have read this study. This is not intended to be a substitute for medical advice, diagnosis, or treatment in regard to any patient.

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