Otto Warburg, a Forgotten Genius

Doepp Manfred

HolisticCenter, 13 Haupt St., Abtwil 9030, Switzerland

Correspondence

Doepp Manfred

HolisticCenter, 13 Haupt St., Abtwil 9030, Switzerland

E-mail: holisticcenter1@yahoo.de

Website: www.drdoepp.org

- Received Date: 18 Aug 2022
- Accepted Date: 23 Aug 2022
- Publication Date: 26 Aug 2022

Abstract

The metabolic hypothesis of Otto Warburg exists beside the gen hypothesis for the explanation of cancer development. It is explained here, with the result that it has a valuable probability. In that way an effectful treatment of cancer can be concluded.

Introduction

Since a long time, enormous sums of money have been spent on research to "defeat" cancer. Unfortunately, it did not succeed. On the contrary, the incidence of cancer is constantly increasing. Cancer will soon replace cardiovascular diseases as the leading cause of death. The conclusion is that our conceptions of the cause of cancer must be inadequate or wrong. Accordingly, so are the methods of treatment.

Most of the time, a theory can be judged inadequate when it becomes overly complicated. Thus, the causes of cancer have now become of an unmanageable complexity.

However, decades ago there was a scientist who named these causes simply and clearly. It was Professor Otto H. Warburg [1].

Otto Heinrich Warburg (* October 8, 1883 in Freiburg; † August 1, 1970 in Berlin) was a German biochemist, physician and physiologist. In 1931 he was awarded the Nobel Prize in Physiology or Medicine for "the discovery of the nature and function of the respiratory ferment." His scientific school produced numerous biochemists and later Nobel Prize winners such as George Wald, Hugo Theorell, Hans Adolf Krebs, and Otto Meyerhof.

The Warburg hypothesis

His scientific contributions included mitochondrial respiratory chain, plant photosynthesis and tumor metabolism. He developed the composite enzymatic assay. His discovery that a large number of malignant tumors have elevated sugar metabolism was the basis for the development of a diagnostic imaging technique, positron emission tomography, in the 1970s.

For the quantitative measurement of gas conversions during metabolic processes, he developed a new device, the Warburg apparatus. With this device, the evolving gases are measured manometrically. For "the discovery of the nature and function of the respiratory ferment," Warburg received the Nobel Prize in Physiology or Medicine in 1931.

Warburg is still best known today in cancer research for the so-called Warburg hypothesis. He had found that tumors were characterized by an unusual concentration of lactate, the product of anaerobic glycolysis, although sufficient oxygen was available for combustion with the help of the mitochondria. From this, he had hypothesized in 1930 that a disturbance or interruption in the function of mitochondria in cancer cells was the main reason for the growth of cancer.

Recent studies suggest that the Warburg hypothesis explains the development of cancer better than the currently prevailing gene hypothesis. For this purpose, cell nuclei from cancer cells were transferred into healthy cells and the cells remained healthy. Then, nuclei from healthy cells were transferred into cancer cells and the cells remained cancer cells [2,3].

Cancer cells are, so to speak, a throwback to the early days of life on earth, when the utilization of oxygen to obtain energy was not yet present, but ineffective lactate metabolism was. How does this reversion come about?

According to Warburg, there are two reasons: 1. a lack of oxygen in the cells, and 2. an over-acidification around and in the cells.

Both causes are related to each other, they usually occur together. They involve an excess of "free radicals", aggressive molecules depleted of electrons, and a lack of electrons in cells in general.

Citation: Doepp M. Otto Warburg, a Forgotten Genius. Biomed Transl Sci. 2022; 2(3):1-3

Otto Warburg in his laboratory in the year 1931.

Consequences

A historical insertion: the transition to oxidative metabolism in the early days of life on Earth was both an opportunity and a risk. The opportunity was the high energy yield, the risk was the emergence of oxidation radicals.

The term oxidation was originally coined by the chemist Antoine Laurent de Lavoisier. He meant the union of elements and chemical compounds with the element oxygen (oxygenium, French: oxygène) and thus wanted to describe the formation of oxides.

Later, the term was expanded to include reactions in which hydrogen atoms were removed from a compound (dehydrogenation). For example, in many biochemical processes, certain coenzymes (NAD, NADP, FAD) "snatch" hydrogen atoms from organic compounds.

Based on ion theory and Bohr's atomic model, oxidation was finally interpreted and generalized from an electron-theoretical point of view. Since then, the characteristic feature of oxidation has been seen in the fact that a chemical substance gives up electrons and is thus oxidized. Oxidizing agent is the substance, atom, ion or molecule that accepts the electrons and is thereby reduced.

It can be postulated that there is a constant struggle for free, reactive electrons in the cells. If vital molecules lose this battle, they lose electrons and become radicals themselves. This concerns e.g. enzymes, the RNA and the DNA. DNA damaged in this way can no longer perform its normal function and transforms the cell into a cancer cell.

One may argue that this happens all the time in many cells of the body, without cancer being the consequence. This is true, because several intracellular enzymes have the task of repairing this damage immediately. However, if these enzymes are damaged, the DNA will not be repaired and cancer will develop [4].

This Warburg hypothesis forms the metabolic theory of carcinogenesis. It cannot be refuted, because it is correct.

Pathways of cancer development

How does the condition described here come about? The pathways can be endogenous and/or exogenous. Endogenous hyperacidity occurs, among other things, when we get angry and as a result too much stomach acid is produced. The use of a proton inhibitor is counterproductive, because it prevents the deacidification of the mesenchyme. Weaknesses in the function of the detoxification organs liver and kidneys also lead to hyperacidity.

Exogenous factors mainly concern nutrition. Sweet foods are converted into acids, food allergies lead to acids, as does the direct intake of acids in the form of beverages, meat or fruits. A good diet contains mostly neutrals (like root vegetables) or bitters (like some teas or artichokes). In more recent times, it is worth mentioning the technical electrosmog, which provides the outer skin with radicals, forcing the organism to relocate its central electron depot under the skin.

Genetically modified foods also contribute to hyperacidity. If one compares an American and a Japanese breakfast under these criteria, one finds that the former overacidifies and the latter deacidifies. The incidence of cancer in the two countries is accordingly different.

Prevention and therapy

For the prevention and for the therapy of a cancer case the application of oxygen is a logical consequence. However, it is wrong to apply normal oxygen in a highly concentrated form, as this increases oxidative stress. On the contrary, the biologically effective form is indicated, it is the singlet oxygen. Since this has a very short life span, devices are appropriate which bind it to water molecules and thus transport it via inhalation to the cells [5,6].

A logical cancer prevention and therapy is beside the useof alcalic nutrients and agents the application of intracellular enzymes, as they are physiologically repairing the DNA. It could be shown that they can treat lung cancer effectively [7].

Summary

To the extent that the Warburg hypothesis of carcinogenesis is not accepted and applied, there will be no reduction in cancer incidence and treatment success rate.

References

1. https://de.wikipedia.org/wiki/Otto_Warburg_(Biochemiker)
2. Seyfried TN, Flores RE, Poff AM, D'Agostino DP. Cancer as a metabolic disease: implications for novel therapeutics. Carcinogenesis. 2014;35(3):515-527.
3. Seyfried TN. Cancer as a mitochondrial metabolic disease. Front Cell Dev Biol. 2015;3:43.
4. Doepp M. The Most Logical Cancer Therapy Concept in The World?. Am J Biomed Sci & Res. 2021 - 13(6). AJBSR. MS.ID.001934.
5. Shinkarenko NV, Aleskovskiji VB: Singlet Oxygen: Methods of Preparation and Detection. In: Russian Chemical Reviews. 1981;50: S. 320–231.
6. https://airnergy.com/
7. Torricelli P, Antonelli F, Ferorelli P, et al. Oral nutritional supplement prevents weight loss and reduces side effects in patients in advanced lung cancer chemotherapy. Amino Acids. 2020;52(3):445-451