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On a possible mechanism of tumor conversion induced by bacterial membranotoxins

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As it has been found, toxins of different origin, like different carcinogenic chemical substances, irradiation and viruses can, at different doses , show *in vitro* diametrically opposite cytopathic effects (cytodestruction, fusogenecity), which will be correspondingly reflected in the clinical picture – beginning at general intoxication and ending with tumor growth. It has not been finally determined but gives a serious cause to expect the same ability and action on the part of some toxins of hemolytic action and generally of membranotoxins of different tropism. Thus, completely different clinical presentations – infection processes, intoxications, necroses, and tumors - correlate with the diametrically opposed cytopathic effects *in vitro* induced by toxins, viruses and other agents of different origin. Based on the above, infectious and carcinogenic processes can, irrespective of the principal difference between them (cytodestruction in one case and cytoproliferation in the other), be induced by the same agent: A bacterial membranotoxin, mycotoxin, (e.g., aflatoxin), any infectious or oncogenic virus, etc. Such double, diametrically opposed cytopathic processes developed in somatic cells by membranotoxins of different tropism (including hemolysins) must be apparently conditioned by: 1) different toxic doses; 2) different rigidity of plasma membrans of stem cells proper (e.g., erythrocytes, leucocytes, etc.), and, most important, 3) the so-called perforation degree, or pores of different size and number formed on the plasma membrane. At the same time, based on the karyogamic theory of carcinogenesis, the initial target for any carcinogens are determinants of cellular membranes, whereas any agent or effect inducing fusogenicity shall be regarded as a potential carcinogen – or fusogenicity of somatic cells might lead to the formation of first a precancerous and then a tumor cell. As rigidity of leucocyte's membranes is higher, it is possible that during destruction of erythrocytes (or immature cells of erythroid line) by hemolytic membranotoxins reversible damages of plasma membranes (pores of definite size and number) can be formed in leucocytes (or in other type of plasma membranes' cells of higher rigidity as compared with erythrocytes), which can promote the process of adhesion of somatic cells, leading further to the process of fusion in somatic cells and the formation of first precancerous and then cancer cell. Thus, some bacterial membranotoxins of different tropism are capable, as a result of damages of the plasma membrane of the target cell of various degree (perforations, lysis), of inducing both infectious processes as well as the formation of first precancerous and then cancer cell.

The lost productivity due to cancer

Tomasz Macioch
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This lecture will address the problem of lost productivity due to cancer related disability and premature mortality. It will discuss cancer consequences to world, region and country economy focusing on major types of neoplasm and will compare the economic burden of cancer with other major diseases (i.e., cardiovascular diseases, diabetes, pulmonary diseases and major physical disorders). It will also focus on methodology of indirect cost measurements, the importance of measuring not only absenteeism but also presenteeism, and informal caregivers to cancer patient's loss of productivity. Based on collected in Poland data on lost productivity due to cancer it will critically discuss the differences and validity of most widely used methods of indirect cost measurements. The importance of indirect cost measurements will be discussed by comparing the indirect and direct cost of neoplasm. In addition to these subjects, attendees of this lecture will be familiarized with the concept of including the indirect cost measurements to Health Technology Assessment (HTA) reports – the basis for this idea, the potential benefits of including indirect cost to HTA reports as well the potential disadvantages and threats of this concept.

Biography

Tomasz Macioch has studied economic consequences of variety of diseases and health technologies for almost 10 years, during which time he has authored more than 50 HTA reports. For more than 5 years he has studied the concept of indirect cost measurements in Polish settings with specially focusing on indirect cost of cancer (his PhD project). He is a member of the committee of COST IS1211 action CANWON focusing on returning to work after cancer.