Editorial

Immunization and oncogenic viruses

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Giulio Tarro
Foundation T & L De Beaumont Bonelli for Cancer Research, University Thomas More UPTM, Italy

Correspondence: Giulio Tarro, Foundation T & L De Beaumont Bonelli for Cancer Research, University Thomas More UPTM, Rome, Italy, Email giuliotarro@gmail.com

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Our immune system is a wonderful and complex integrated network of chemical and cellular mediators developed during evolution to defend against any form of chemical or infectious insult and presupposes the ability to distinguish between endogenous or exogenous structures that are not a danger , and that therefore they may or should be preserved (self), and the endogenous or exogenous structures which, on the contrary, prove to be harmful to the organism and they must then be eliminated (non-self). Discrimination between self and non-self is occurring at the molecular level and is mediated by particular cellular structures (recognition of T cell receptors, MHC complexes, antibodies) that allow the presentation and recognition of the components of the agent defined as antigens (literally inducers of antibodies). Two areas of the immune system can be distinguished depending on how antigens are recognized. The first, unspecified or innate immunity: includes chemical mediators (responsible for inflammation) and cells responsible for a first line of defense against aggression. From the evolutionary point it is more ancient and allows the recognition of a limited repertoire of antigens. It recognizes a generic condition of danger and places the immune system in an "alert" condition that favors the development of specific immunity. The second, acquired or adaptive specific immunity: it includes chemical and cell mediators responsible for a more potent and targeted defensive response (virtually recognizing any form of antigen), but slower. This second type of immunity from an evolutionary point of view is more recent and is based on the non-specific response to numerous antigen presentation and destruction functions. It is divided into: specific humoral immunity (ie mediated by antibodies) and cell-mediated specific immunity. Is it possible to intervene to strengthen this system? Paradoxically, the question should be another: is it a good idea to boost the immune system? It was provoked a couple of years ago by a physician - Jeremy Samuel Faust, Primary at the Sinai Hospital in New York – who became famous in the US for his campaign against the proliferation of immune system supplements that he considered expensive placebo to stay away. The first type of immunity is a fast, wide and incredibly uncoordinated system. When activated it leads to effects such as fever, cough, closed nose, bone pain. Symptoms are usually quite similar, regardless of the fact that there are several hundred viruses that cause colds. Before the body has "understood" exactly how invasion is underway, the innate part increases body temperature (hence fever) to try to "cook" the microbes and cause cough and mucus to try to expel them. This type of casual response is a little useful - albeit annoying - but it is not what really defeats an infection. The real work to neutralize an infection is the acquired part of the immune system, the part with targeted weapons of the immune system that continues to build and enrich it throughout life. As already mentioned, this system contains B and T cells that produce and interact with proteins called antibodies that can attack an incredible number of specific infections. Although a small percentage of antibodies are transmitted from the mother to the baby, most are produced when a person has to deal with a certain type of infection for the first time. The resulting antibodies are similar to ammunition that the body holds for decades if an invasion of that type occurs again. If the body has previously been exposed to an infectious pathogen (or received a vaccination), the acquired part of the immune system is "remembered" and is able to detect it quickly in the event of a new infection of the same type. Once it is reactivated, the system produces only and exclusively the antibodies needed, with astonishing precision and efficiency. Much of the most common and less aggressive viruses are done this way, usually in a few days. New viruses are faced with a similar approach. The only difference is that the immune system has no memory because it has never seen them before, so it takes more time to produce the necessary antibodies.

Meanwhile, the innate part of the immune system continues with its wide-ranging reaction for much longer than necessary. While the acquired part has finished and won the actual battle, the innate part does not realize it and continues to fight as if nothing was. And that is why sometimes, the sore throat and the cough can last for weeks, even after a rather modest viral infection. For this reason, boosting your immune system would be a bad idea. Bench products can not enhance the acquired part of the immune system. In the treatment of viruses that cause symptoms like colds the most important thing is to suppress, not to boost, the awkward, gritty response of the innate part of our immune system. That is why they take drugs to reduce fever and antihistamines. Although a natural enhancement is possible, the concept at its base is wrong. In extreme cases, an over-reaction to an infection may even lead to changes in our vascular system, leading to sepsis or shock. Very remarkable it is then the role of the Human Papilloma viruses (HPV); these are viral agents that were put in correlation with the carcinoma of the cervix of the uterus, particularly the types 16 and 18 are considered certainly carcinogenic for the man. The prevalence of this infection is very high among the sexually active adults and increases with the number of sexual partners. Insofar persistent infection is important in the carcinogenesis. It's therefore a tumor that "is transmitted by the sex route". The HPV is responsible of the 80% of the carcinomas of the cervix of the uterus that occur in the industrialized countries and in 90% in those developing. This means that are attributable 70.000 new cases of carcinomas of the cervix of the uterus to the HPV in the industrialized countries and 260.000 cases in the developing countries. The HPV can also cause squamous carcinomas of the vulva, of the penis and of the anus. One can calculate that these viruses cause almost 30.000 cases of carcinoma of the vulva in the world. Also for the anal carcinoma it can be thought that there is an agent transmitted sexually important for its etiology and in fact these viruses can be noticed in a high percentage of anal tumors. Other tumors are finally associated potentially to the HPV, particularly the tumors of the head and neck, of the esophagus and of the skin, even if these associations must be confirmed. The

factors of epidemiological risk for the papilloma viruses are well established by now from the scientific bibliography. The proteins E6 and E7 particularly interest us because are able, during the process of malignant transformation, to stop the oncosuppressors. Therefore in the interpretation of the various stages of the cervical cancerogenesis it is important to establish that exist at least two mechanisms: the first tied up to the effect of papilloma viruses, agents of sexually transmissible diseases, and then that tied up to papilloma virus that has the DNA responsible of dictating a code of malignancy as the types 16, 18, 31 and others. The passages from a stage to the other of the cell proliferation can be catalyzed, activated, by other factors as the HSV-2, the smoke, the hormones, the contraceptives etc.

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Conflict of interest

Authors declare there is no conflict of interest in publishing the article.