

Börner Ecological Resource Enhancement

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Biological considerations for the COVID-pandemic

The COVID-pandemic is a disease (COVID-19) based on an easily-spread virus (SARS-COV-2) and may cause lung and organic failure potentially resulting in death. The following considerations are based on biology rather than medicine, virology or law.

1. Individual behaviour

The mainly recommended precautions for individuals are social distancing, personal hygiene and wearing a mask. This is good but rather insufficient.

The primary strategy should be to establish various personal defensive walls and to strengthen the body's own potential for immune response. All these aspects are challenged not only by the virus variety first or currently in circulation, but also any later mutations of it.

The first defensive wall aims at minimizing the exposition to the virus. It is transmitted as smear, droplet and aerosol infection.

- a) Smear infection is avoided by measures of prophylactic hygiene. They comprise of – a.o. - the periodic disinfection of all things regularly touched by a number of persons (door handles, shopping carts, shelves, merchandise surfaces) as well as the periodic washing of hands; it is not necessary to wash them with a disinfectant ; soap is sufficient as the washing with any sort of lye (alkaline solution) will dissolve the fat envelope protecting the genetic information of the virus.
- b) Droplet infection is avoided by having people cough and sneeze into the crooks of their arms and by keeping your distance.

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- c) Aerosols spread wider than droplets, but still only over a limited distance so that social distancing is helpful. However, aerosol exposure gets increasingly dangerous as the number and the duration of stay of people increase in a confined space. In consequence, this means to minimize the risk of infection by avoiding confined spaces, crowds and extended stays.

Thus, the occupation of a given room together with its ventilation and other disinfection measures decide about the effectiveness of the confinement situation. In a given case of aerosole concentration the number and propagation of the virus can be diminished by effective and periodic airing and powerful air cleaning machinery, including e.g. an application of ultraviolet rays. Therefore, it is appropriate to order restrictions for the number of people and the length of their stay in a room

There are encounters and gatherings in the open as well. Here social distancing is paramount (1.5 m in general, 2.5+ m in case of activities with hard breathing).

- d) For the individual, it is best to have periodic stays in fresh air with a minimal number of distanced encounters. Sunny weather has the effect to destroy the virus. This is because of the ultraviolet rays of the sun; it is not a matter of high temperature as proteins normally do not start to disintegrate at temperatures below 42-45 centigrades.

The second defensive wall aims at ousting any virus you might have received, and this as soon as possible, viz. before it can attach to a human cell. This means exhaling deeply via the nose (for cleaning the nose and the rear pharynx) and the mouth (for cleaning the throat, the trachea and the lungs). Be aware of the fact that about one third of your lung volume is not needed for daily life and thus carries an inactive air volume which is rarely exchanged and provides for a nice, warm, and moist pool for the virus. For breathing hard, exercise sports or yoga or shout and sing (because of such virus expulsions, many people have contacted the virus at religious services or in gyms).

The third defensive wall shall weaken any virus that you might have caught.

The first step is a periodic mouth and pharynx hygiene. Simple rinsing may already wash out and expel the loose (non-attached) virus; gargling is more effective. Alcohol and lye (like e.g. mouthwash) attack the fat envelope of the virus; even if, because of a low concentration, a longer period of affect is necessary to kill the virus, they combine with the washing effect, attack the fat envelope of the virus and make any remaining virus weaker, viz. to fall more easily to the immunological response of the body.

The second step aims at the lungs from where the virus load should be exhaled. The lung is affected by dry air, while moist air helps the vitality of the lung and makes it easier to exhale any loose virus. Inhaling damp air enriched with pharmaceutical dissolutions is quite effective; even chlorine as found in the air of indoor swimming pools can help; the effect of tobacco smoke is unclear. As all inhaled

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substances are straining the lung, it is of paramount importance to find a well tolerated dosage.

The fourth defensive wall shall exterminate the virus. This is the task of the immune response system; this task is the less arduous the fewer virus have entered into the body and the weaker they are.

Primarily, see to it that your immune system is healthy and in a good condition. This is achieved by some sort of exercise, a healthy and balanced nutrition as well as the absence of stress.

Similar to other body parts, our immune system needs exercise, which means regular though moderate challenges. This starts in childhood and does not end with adulthood. Those who keep their surroundings in absolute hygiene should not wonder that their immune systems start to react on substances of the own body rather than external threats.

Malnutrition and starving have negative impact on our immune system. As the body needs it rarely, it is first to be cut down in case of defective or insufficient nutrition. Undernourished persons, anorexic persons, and those people who do not absorb enough vitamins and trace elements, are first to die.

Stress on the human body like e.g. too little sleep, too much work, or too much exercise, reduce the body's defences. In such situations, the body concentrates on the vital functions; e.g. for a person running from a cave bear, a virus or a germ are less urgent problems.

Stress on the soul has the same effect as stress on the body. Mental burdens and exceptional situations cause unhappiness and disbalance not only the soul but also the body so that the immune system is the first to suffer.

Moreover, the immune system needs support:

Here vitamins come into play. Vitamin C is effective against the virus causing a cold and may also be effective against the corona virus. Vitamin D is transformed in our body from the provitamin by the effect of ultraviolet rays, especially the light of the sun. It is possible that the vitamin has a direct effect on the virus. Certainly it helps the bones where in the marrow the defensive cells are produced.

We know, and it is logical, that for an actual immunological defense the body needs more vitamins than in a relaxed state of readiness. Superfluous amounts of vitamin C will be discharged. The body produces only so much vitamin D from the provitamin, as it really needs. However, the vitamin D level of old persons usually is too low so that they need a refilling.

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It is very important for the support of the immune system that you do yourself „something good“. This may be additional sleep or rest, a special meal, a relaxed conversation, or a favourite activity, any and all of this, if it convinces you that „this has been really good for me.“ The conscious pleasure of a real treat does not only help to keep you balanced but also substantially supports your immune system.

2. Therapeutical approaches

Those who keep themselves robust and vigorous, do not fall sick, stay free of symptoms, or develop only slight symptoms. However, even the slightest symptoms must be taken serious as they are a signal of the body that it has to concentrate on battling the virus; and you have to give ample opportunity for the body to concentrate its forces on this task.

The corona-illness starts with light symptoms, and already in this state the full-fledged response of the body must have absolute priority.

The basic is: He who fights, needs ammunition and morale. This means an adequate nutrition which does not burden the body yet contains all the necessary elements, and the formation of confidence that all will turn out well.

Sick persons should be exposed as much as possible to fresh air and sunlight, even if this means additional work for the nurses. Fresh air is clean air; regular deep exhaling enables the throwing out of the non-attached virus load and must be induced especially for bed-stricken persons; they should be taken into a sitting or standing position in order to stimulate circulation and to facilitate normal breathing. The sunlight helps with ultra-violet rays and induces the production of vitamin D. The sight of a natural surrounding, even via TV, helps the soul.

The body in defensive mode need more vitamin D so that the level must be controlled and, if necessary, additional dosis beyond the statistical mean values should be administered.

The virus diminishes the lung capacity, and breathing becomes more and more difficult. This raises the need for calories and means a significant mental burden. This constriction will be eased with a direct feed of air enriched with oxygen. This air should also carry some sort of disinfectant like chlorine or alcohol in order to avoid the swamping of the lungs with the virus (cue: indoor swimming pool air).

Viral antidotes help to avoid a collapse of the immunological response.

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Artificial (machine) breathing (which means having induced an artificial coma) is the last step and should be postponed as long as possible because of the severity of the intervention. Each body has its own limitations, and this is also true for the vital limit of oxygen saturation; just think of a well-trained apnoe diver. So do not rely only on statistical values but rather preferably on the patient's symptoms for lack of oxygen.

The after-damages, which show up after an infection, even after an infection without symptoms, require special attention. They may affect all organs of the body, amongst them also the brain and probably also the gonads. This makes it important to cure the illness completely and not to return into daily life too early.

3. Vaccination

In principle, there are three vaccination strategies:

You may introduce antibodies in support of the body's own immune system. This is recommended in case of illness.

You may introduce antigenes, and this may mean weakened full antigenes (as with the flu shots) or parts of antigenes. In both cases, the immune system is trained for recognition and extermination of the foreign protein sequence so that it can react in a repeat case quickly and effectively. Both strategies have advantages and disadvantages in production, distribution, application, and effectiveness. In the following, we concentrate on the effectiveness as all other aspects can be handled with the appropriate technique:

Weakened antigenes consist of the complete or nearly-complete genetic sequence of the virus. The body's immune system decides whether to react on the whole genetic sequence and/or on one or several parts of it.

The first consequence is that the application of the vaccine is safe for mitosis and meiosis. As the genetic sequence of the virus differs from any of the body's own sequences, there is hardly any chance that the immunological response may turn against the body's own substances.

The second consequence is that due to the recognition of the broad sequence of the antigen, a later substantial variation of the sequence, viz. a new viral stem, will not be recognized and requires another vaccination; we know this from the annual flu shots.

Here so-called virus particles consist of short genetic sequences which are characteristic for the virus. The body's immune response will act upon these characteristic sequences and catches all virus with this sequence, even those with genetic alterations in other parts of the genetic sequence which have not been selected for the vaccination.

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The first consequence is the danger that the selected genetic sequence of the virus may resemble a genetic sequence in the human body. Then either the particles which are not readily neutralized may either be put into the human cell's genetic sequence during mitosis or meiosis without early recognition by the human cell's own repair mechanism, or the particles may mislead the immune system to attack the body's own sequences because of their similarity. In the first case („wrong insertion“) the patient or his progeny may be adversely affected. In the second case („misleading similarity“) there may be auto-immune reactions (as currently feared for a placenta hormone).

The second consequence is that the vaccination is effective for all virus mutations which have not affected the selected genetic particle, and is normally not effective against those mutations which have occurred in the selected particle. In the second case, the dimension and the point of the mutation must be analysed with regard to the effect on the human immune system.

In contrast to the above, the side effects, which any vaccination may have, are not so important. Allergical responses may be triggered by the vehicle or the antigens, the envelope or the genetic particle, but they are rare.

4. Pandemic

The world population will hardly reach a herd immunity. There may persist „pockets“ with populations with virus and /or virus mutations which then produce further mutations. The general mobility will carry known and new, unknown corona virus into the population centers, where one is dependent on the swift isolation of the porters, the spreaders, and the newly infected persons in order to avoid new waves of infection.

This means for everyone of us that one may not conclude to be sufficiently immunized by vaccination. Rather it remains a necessity for everybody to avoid infection and to be attentive to keep one's immune system robust or, given the case, re-invigorated. Keep your distance and, in a given case, avoid contact and obey to the rules and recommendations. In view of potential virus attacks do what is necessary to keep your own defenses intact.