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RESEARCH ARTICLE

CAN INFLUENZA VIRUSES BE INACTIVATED BY A "NOSE-MOUTH-NOSE" BREATHING TECHNIQUE?

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ABSTRACT

Seven years ago, I presented an oral communication "Nasal breathing technique in nasal airway obstruction. Viral infections in upper respiratory tract", in the 20th World Congress of the International Federation of Oto-Rhino-Laryngologycal Societes, IFOS, Seoul, 2013. This is a technique based on physiological concepts of breathing, to avoid the use of nasal decongestants in a cold or flu. We have to breathe the air we exhale. It is air with a high concentration of CO2, but it is not toxic. Inhaling carbon dioxide in the air we exhale through a nasal mask made by ourselves, using our hands, acts as a nasal decongestant. I think it is possible that this breathing technique can inactivate the flu virus, because the people who used it (10 patients), did not develop the flu in these years.

INTRODUCTION

Nasal airway obstruction is one of the first symptoms of viral infections in the upper respiratory tract. In this condition, air goes directly into the respiratory tract without warming up in the nostrils, and is breathed through the mouth instead of the nose, causing oropharyngeal discomfort. In order to solve this problem, we use topical nasal decongestants; they are very effective and safe, when used for a short period of time. However, we are aware of its side effects, and it is unlikely that we will have them on hand, when the first symptoms of a cold or flu appear. On the other hand, the effectiveness and safety of nasal decongestants are limited (Deckx, 2016).

Aim: By using a breathing technique, we can improve the nasal obstruction that occurs as a result of suffering a cold, and thus avoid the use of nasal decongestants (Carlos Sánchez Fernández de la Vega, 2013). I try to persuade my patients not to use nasal decongestants. Moreover, by practicing this technique, the viruses could be inactivated.

Method: We have to consider the physiological concepts of breathing (inhalation and exhalation), to explain the nasal decongestive effect of this technique.

The composition of the inspired air is different from that of the exhaled air, with the following standard values for respiratory gases (Gillian Pocock, 2013):

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A/ Inspired air: O_2 (21 %); CO_2 (0,04 %); N_2 (78, %); Argon (0.9%); Water (0.0 %).

B/ Expired air: O_2 (16 %); CO_2 (4 %); N_2 (78 %); Argon (0.9%); Water (4 %).

The CO_2 gas exhaled is about a 100-fold increase over the CO_2 inhaled amount. So, the air we breathe out (exhaled air), contains about 100 times more carbon dioxide concentration, more water vapor and less oxygen. This fact is important in explaining the hypothesis I adopted, according to which the concentration of carbon dioxide in the exhaled air could act as a vasoconstrictor of the nasal mucosa and inactivate influenza viruses. On the other hand, nose breathing helps us to use our own nitric oxide generated in the sinuses. The confirmed function of the nitric oxide is destruction of viruses, parasitic organisms, and malignant cells, in the airways and lungs, by inactivating their respiratory chain enzymes (Chaves, 2010; Jefferson, 2010). There is a very interesting article "Evidence for cure of flu through nose breathing", about how nitric oxide prepared in the sinuses uses and kills the flu virus to cure us of the flu (Sana Jamshald,2013). The physiology of the autonomic nervous system, helps us to understand the decongestant effect of this breathing technique: General innervation to the nose involves the autonomic nervous system, the parasympathetic and sympathetic nerves. The glands of the nasal mucosa, as well as the vessels, have a direct parasympathetic innervation, which leads to a direct parasympathetic increase in nasal secretions via transudation and exudation (Golding-Wood, 1963).

Several co-transmitters were detected in the nasal respiratory mucosa (Baraniuk,1998). Parasympathetic neurons mainly have a vasointestinal peptide (VIP) as co-transmitter to acetylcholine (Figueroa *et al*., 1998). VIP stimulates secretions (more serious than mucous) and vasodilation in the arterial and sinusoidal vessels (Knipping, 2004). Sympathetic neurons contain the neuropeptide Y (NPY) as a key co-transmitter for noradrenalin and predominantly innervate arterioles and arteriovenous anastomoses. Release of NPY results in prolonged vasoconstriction, along with decongestion of the venous sinus vessels (Baraniuk,1992). Therefore, the activation of the sympathetic nerves leads to a decrease in blood flow and a remarkable vasoconstriction, and the activation of the parasympathetic nerves leads to an increase in blood flow and a remarkable vasodilation. Stimulation also occurs during each cycle of breathing. Inhalation stimulates sympathetic activity and exhalation stimulates parasympathetic activity. Nasal breathing can alter metabolism and autonomic activities. This increase in metabolism may be due to increased sympathetic discharge in the adrenal medulla (Telles,1994). Carbon dioxide activates the sympathetic tone, thus increasing adrenaline levels. Stimulation of the sympathetic system decreases nasal congestion and discharge (Fig.1). This could explain the decongestant effect of this technique. It is suggested that both sympathetic and parasympathetic components, play a role in alternating symptoms of unilateral nasal obstruction This could explain the decongestant effect of this technique. This way, it could be explained the decongestant effect of this technique. Both sympathetic and parasympathetic components are suggested to play a role in alternating unilateral nasal obstruction symptoms (Sarin, 2006).

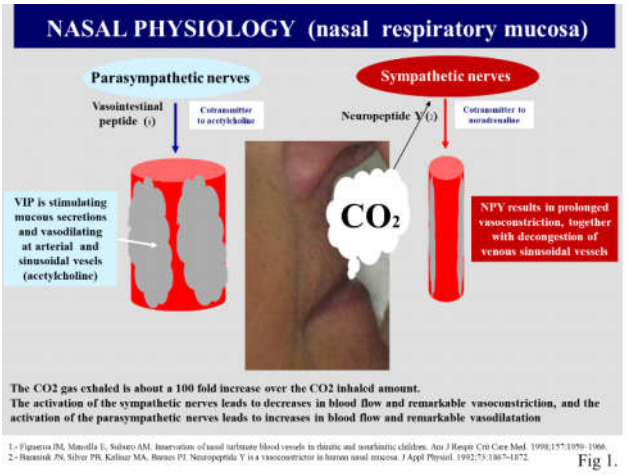

Fig 1.

How is this technique used?

We have to make a nasal mask with our own hands. It is very simple. (Fig. 2).

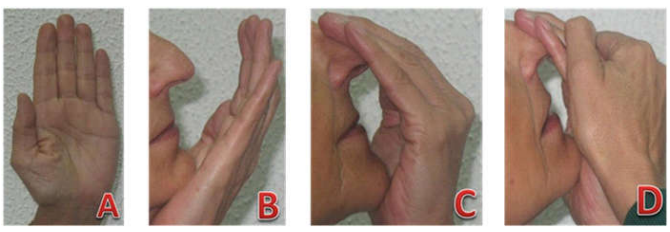

Fig 2: The nasal breathing technique using the left hand

A/ Put your hand in an upright position, as shown in the picture.
B/ Place the palm of your right hand under the chin, in contact. This serves to create a cavity between the hand and the mouth.
C/ Flex your fingers and touch the tip of your nose.
D/ With your left hand, raising your elbow 90 degrees, grasp the fingers of your right hand to bring them together.
You now have a mask! You just inhale the air you exhale through your mouth.

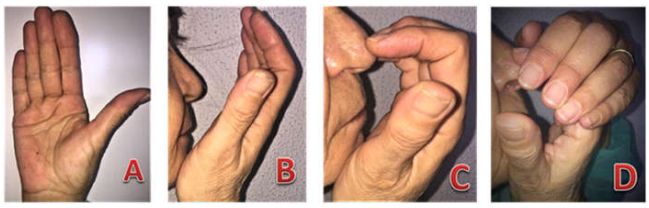

Fig. 2. The nasal breathing technique using the right hand

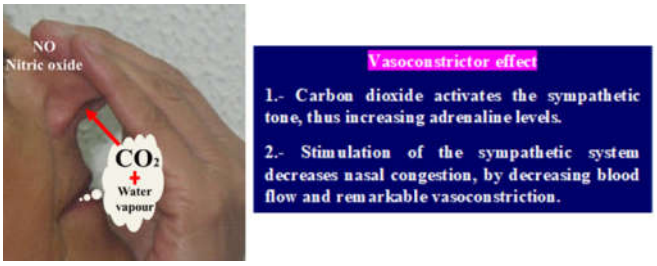

Fig 3. We have made a nasal mask to breathe the air we exhale. It is air with higher concentration in CO2 than normal air, and with a decongestant effect in the nostrils.

Fig 4. A nasal mask

The activation of the alae nasi will decrease nasal and total airway resistance during voluntary nasal flaring and during CO2 inhalation and thus should be considered in any studies of upper airway resistance (Strohl, 1982). I think when we get a cold, the first symptom is often a sneeze, that no one attributes to exposure to respiratory viruses. For this reason, I recommend my patients do this breathing technique for 45-60 seconds, every time they sneeze. It is difficult to appreciate the difference with the sneezes of other aetiologias. This simple technique could inactivate respiratory viral infections. Another significant clinical fact that we have observed, is that the cough disappears if we use the technique for several minutes. This can be explained by a fluidification of the mucous membranes of the respiratory tract. Nasal congestion is relieved by the use of this technique, if practiced for a short period of time (between 1-1.5 minutes), 3-4 times in a row, several times a day when the first symptoms of a cold appear. It is necessary to

make a brief pause between them (about 30 seconds), because otherwise we will get tired. At first, we hardly observe any changes in nasal obstruction, but each time that we practice the technique, the nasal decongestant effect is greater and we breathe better.

RESULTS

It takes me a few minutes to train patients in this breathing technique, explaining them its therapeutic benefits. Elderly patients may find it difficult to perform, in which case, a nasal breathing mask may be helpful (Fig 4). We have observed that, 10 patients that did use this breathing technique correctly, they did not develop symptoms of flu viruses over the years. They did not come to my office because of symptoms of a cold, saving themselves by means of using this respiratory technique. Some of them, they didn't get a flu shot. Of course, I recommend that all my patients get a flu shot, but I also recommend that they practice the technique for 60 seconds, every time they sneeze. I don't know exactly why this happens, but I think this theory might be correct. It's just another possibility.

Conclusions

This is a safe, efficient and effective technique to reduce the use of nasal decongestants in nasal obstruction by a cold or flu virus. Finally, I transcribe some paragraphs from WORLD HEALTH ORGANIZATION about: Instructions for storage and transport of samples of human and animal cases and suspected or confirmed isolates of influenza A (H1N1). Date Posted: May 20, 2009 "Specimens should be collected and transported in a suitable transport medium, on ice or in liquid nitrogen. Specimens collected for influenza virus isolation should not be stored or shipped in dry ice (solid carbon dioxide) unless they are perfectly sealed in glass or sealed, taped and double plastic-bagged. “Carbon dioxide can rapidly inactivate influenza viruses if it gains access to the specimens through imperfect seals”: microscopic leaks in the seal may allow carbon dioxide gas to penetrate the primary container as a vacuum is created during freezing”.

Other interesting documents:

- “Virus and bacteria inactivation by CO2 bubbles in solution” (Adrian Garrido Sanchis, 2019).
- Possibility of Disinfection of SARS-CoV-2 (COVID-19) in Human Respiratory Tract by Controlled Ethanol Vapor Inhalation (Tsumoru Shintake, 1919).
- Evidence for the cure of flu through nose breathing (**6**).

These publications on inactivation of viruses by different gases should make us reflect about the usefulness of this technique.

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