

Proposal for vocal rehabilitation in patients extubated by COVID-19

Propuesta de rehabilitación vocal en pacientes extubados por COVID-19

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Abstract

Vocal reeducation is known as a set of breathing, relaxation and posture techniques, which together help us to improve the quality of voice production after dysphonia due to vocal use and abuse, or a treatment that has been invasive for the patient's vocal cords. The objective of the following study is to investigate about the patients who have been intubated by SARS-COV-2 (COVID-19), through the statistics that the General Hospital 450 of the State of Durango can provide us, to raise awareness about the damage caused, and especially the intervention of the Human Communication Therapist, in the area of voice such as vocal reeducation. For this research, a study of 83 people infected from March 2020 to December 2020 was carried out, of which only 18 presented voice problems. It is worth mentioning that not all of these patients survived; of these 83, only 17 were successfully intubated, but of these successful extubations, only eight survived. These results, tell us that, not only they need to be extubated, but also, they must survive, since, to intubation being an invasive method, patients mostly fail to survive.

Vocal reeducation, Extubated patients, COVID-19, General Hospital 450

Resumen

Se le conoce a la reeducación vocal, como un conjunto de técnicas de respiración, relajación, y postura, las cuales en conjunto nos ayudan a mejorar la calidad de la producción de voz después de alguna disfonía por el uso y abuso vocal, o un tratamiento que haya sido invasivo para las cuerdas vocales del paciente. El objetivo del siguiente estudio es indagar sobre los pacientes que han sido entubados por SARS-COV-2 (COVID-19), mediante las estadísticas que nos puede llegar a brindar el Hospital General 450 del Estado de Durango, concientizar sobre el daño causado, y sobre todo la intervención del Terapeuta de la Comunicación Humana en el área de voz como lo es la reeducación vocal. Para esta investigación, se realizó un estudio de 83 personas contagiadas en las fechas de marzo 2020 a diciembre del 2020, de las cuales, solo 18 presentaron problemáticas de voz. Cabe mencionar que, no todos estos pacientes sobrevivieron, de estos 83, sólo 17 son entubados con éxito, pero, de estas extubaciones con éxito, de igual manera sólo sobreviven ocho. Estos resultados, nos dicen que, no sólo necesitan ser extubados, sino que también, deben sobrevivir, ya que, a la entubación al ser un método invasivo, los pacientes en su mayoría no logran sobrevivir.

Reeducación vocal, Pacientes extubados, COVID-19, Hospital General 450

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Introduction

Prolonged intubation can affect the voice, and can be associated with laryngotracheal lesions, vocal cord paralysis, among others, but it is possible to improve voice processes, as there are treatments provided by a human communication therapist for vocal re-education. Muscular re-education by means of various vocal techniques is absolutely necessary.

Vocal rehabilitation and re-education will depend on the degree of severity, access to health systems, duration of symptoms and some other determinants, as this will have an impact either positively or negatively on the patient's prognosis.

According to Cabrera, P (2019), vocal re-education consists of the assessment of the mechanics of vocal production and the establishment of certain techniques and exercises to restore correct vocal function. Vocal re-education should be approached from an integrative and global perspective (Bustos, 1995).

Orotracheal intubation, an aggressive technique, is frequently used in out-of-hospital emergency departments. The reasons for resorting to this technique are all those that cause alteration of respiratory function, including: permeable airway, adequate respiratory drive, among others (Artigas, 2002).

The aim of this research is to demonstrate that the Human Communication Therapist is important in this part of vocal rehabilitation, and in this way, methods will also be proposed to have an adequate rehabilitation, especially in patients extubated by COVID - 19, as well as giving them an adequate follow-up as required, as it is considered important that patients are informed of all practices, and this one in particular, as they are not always very aware of the damage that can be caused by this technique that provides respiratory benefits. As this is an aggressive technique, it creates problems for swallowing and, especially, for the voice.

Justification

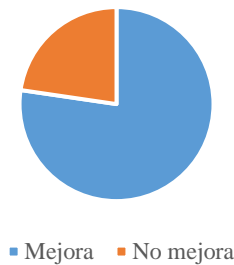
Vocal re-education therapy is recommended for this particular case, as it consists of relaxation, breathing and vocalisation techniques, and the patient is gradually guided to return to his or her usual voice by means of different techniques, indications and care that he or she should try to follow during and after the vocal re-education therapy. Due to COVID - 19, the population with this type of alteration in voice production as a result of intubation has increased.

The main function of vocal re-education is to adapt voice production, timbre and tone, as well as to reduce discomfort until it is eliminated little by little, as the re-education process takes time, depending on the patient's damage, effort and interest that the patient may present as a result of invasive intubation, abuse or vocal misuse.

In vocal re-education, not only vocalisations are used, as one might think, but also breathing exercises to correct the breathing pattern, which is very important for voice production, depending on the vibrations of the vocal cords.

According to Elhendi Halawa, W., (2011), in his article "Effectiveness of vocal treatment", before treatment, the speech therapist (in this case, the therapist) should make an assessment of the tone, intensity, vocal attack and the degree of damage to achieve the diagnosis, and thus give a treatment appropriate to the damage and patient. It is shown that 75 patients (77.32%) presented clinical improvement, while 22 patients (22.68%) did not improve. This indicates that vocal re-education is effective, while Brodniz (1963) presented a study that determined high incidence of recovery in patients with voice problems external to intubation.

Eficacia del tratamiento



Graphic 1

This graph shows the improvement of the 75 patients (blue) and the 22 (orange) who showed no improvement.

Problem

Intubation of the patient with COVID-19, who already has respiratory complications, should be done under these characteristics:

Orotracheal intubation is considered if the patient presents with:

- Increased work of breathing
- Refractory hypoxaemia: O₂ saturation < 90% despite supplemental oxygen. Acute Respiratory Failure and Shock criteria.

Note: If intubation is considered as an option, it should be performed as soon as possible due to the risk of rapid deterioration of the patient (Vera, M., Acuña, D., 2020).

Because of these problems, intubation is considered, but it is during extubation that possible complications in swallowing and voice production occur. The solution proposed in this research for voice production is vocal re-education.

According to Le Hauche and Allali, (1994), vocal re-education comprises three different and complementary parts:

1. Exploration and experimentation by the patient, under his real vocal possibilities, which can be related to the discovery of the significance of his vocal difficulties thanks to the information given by the re-educator, in this case the therapist.

2. The re-educational treatment of the vicious circle of vocal effort, when it exists.
3. The application of techniques aimed at compensating for possible organic deficits affecting the vocal organs.

General objective

Prevalence of patients extubated in the General Hospital 450 of the State of Durango, in a period from March 2020 to December 2020, as a result of COVID-19, as well as to propose an intervention plan in patients who presented voice alterations due to previous intubation, by means of vocal re-education.

Specific objectives

- To find out about the damage and complications that extubated patients suffer, thus proposing vocal re-education as a rehabilitation method.
- To investigate the importance of vocal re-education treatment after intubation.
- To communicate to patients the importance of vocal re-education treatment after intubation.

Theoretical framework

Background

SARS-CoV-2, known as coronavirus, is a virus that had its first known appearance in late 2019 in Wuhan, China, which after this appearance, had a rapid spread throughout the world, thus triggering a pandemic. The symptoms that occur are variable in each person, among the most common are cough, fever, headache and muscle pain, loss of smell and taste, and in more severe cases, there is shortness of breath, or chest pain. This virus causes the disease better known as COVID-19.

Intubation helps to improve the patient's condition, but also creates serious difficulties in recovery, as it consists of placing a tube through the mouth into the trachea to provide respiratory support. The longer the patient is intubated, the more likely he/she will have difficulties in recovery.

Vocal re-education comprises, on the one hand, a series of sessions which, with few exceptions, take place in the therapist's office and, on the other hand, brief training (in principle, daily) which the patient carries out at home (Le Huche, Allali, 1994).

Approximately 3.2% of patients with COVID-19 require intubation and invasive ventilation at some time during the course of the disease, which requires self-protection measures for healthcare personnel as well as adequate preparation and airway management of patients (Meng L, Qiu H, Wan L, Ai Y, Xue Z, Guo Q, 2020).

Anatomy and physiology of the larynx

The three elements of the vocal apparatus

The vocal apparatus consists of three parts:

1. The bellows.
2. The vibrator.
3. The resonators.

The bellows

The voice can be considered as a sonorous aspiration, since, in quiet breathing, the lungs are inflated by the action of the inspiratory muscles, and are emptied when the muscles relax and return to a resting state. In phonation, on the other hand, breathing is active: that is, air is expelled from the lungs by the action of the expiratory muscles. This breathing is necessary for voice production, called "phonatory murmur".

The phonatory murmur is not always produced in the same way: sometimes it is produced by the lowering of the rib cage. Other times it originates from the action of the abdominal muscles or murmur, which develops in vocal production.

The diaphragm, which is the main inspiratory muscle, is a dome-shaped sheet of muscle that separates the thorax from the abdomen, and above it are the heart and lungs.

It plays an important role in vocal projection: inspiratory in the vocal impulse, and regulatory in the phonatory murmur at the moment of action of vocal production.

The vibrator (the larynx)

The larynx is the upper end of the tracheal tube, which connects to the pharynx, being the main organ of voice production, although it is a secondary function, the main function is to facilitate the obstruction of the trachea. The vocal folds (better known as vocal cords) are part of the larynx and are made up of two muscles and the mucosa by which they are covered.

The vocal folds are like two horizontal lips, positioned at the top of the trachea and located inside the larynx, one on the right and one on the left side of the larynx. Being joined at the front, they can be separated and joined together by the action of the pulmonary murmur.

The glottis is the space between the vocal cords when they are far apart. Above the vocal folds are two other somewhat similar folds, the vestibular folds (also better known as false vocal folds), which have no function in voice production.

The epiglottis functions as a valve which, at the moment of swallowing, contracts backwards, so that it functions as a lid for the larynx, so that food and liquids take the correct path into the oesophagus (not into the lungs via the pharynx). If the epiglottis does not descend at the right time, the saliva or food can take the wrong path, so coughing occurs as a defensive act to expel the food that has taken the wrong way out of the trachea and larynx.

The resonators

The larynx ends above the pharynx, which is a muscular cavity capable of narrowing laterally and from back to front. The larynx is made up of three levels, superimposed from top to bottom:

1. Laringofaringe.
2. Orofaringe.
3. Nasofaringe.

Laryngopharynx

The laryngopharynx corresponds to the entire pharyngeal area, located below the free part of the epiglottis, which descends to close the tube, although the food or liquid does not only pass above the epiglottis, but also through both sides of the tube, called pharyngolaryngeal canals, sinuses or pyriform accesses.

Oropharynx

When the large mouth is opened, the anterior and posterior bases of the soft palate, which are vertical folds of the mucous membrane, can be seen at the back on each side, separating below the tongue and meeting at the top to form the uvula.

Nasopharynx

When the soft palate descends, the oropharynx communicates with the posterior part of the nose, or nasopharynx. The palate rises, and in this action prevents air from passing through the nose. When we speak, the soft palate remains lowered for vowels and nasal consonants (m, n, ñ), and rises for other phonemes.

Internal configuration of the larynx

The larynx is divided into three parts, or levels:

Supraglottic level

This part consists of the laryngeal vestibule, in which the upper orifice of the larynx opens at the top.

1. It is oval, positioned upwards and backwards, the upper orifice of the larynx, better known as the laryngeal crown, is formed from front to back:
 - a) The posterior aspect of the epiglottis.
 - b) The arytenoepiglottic ligament.
 - c) The interarytenoid incisure.

The vestibule is a funnel-shaped structure.

Its anterior face corresponds to the posterior face of the epiglottis.

Glottal level

When the glottis is open, there is a triangular space defined by the vocal cords. The anterior two thirds of this space constitute the ligamentous glottis. The posterior third corresponds to the cartilaginous glottis.

Infrataglottic level

At this level, the larynx widens progressively from top to bottom to join the trachea.

Vocal re-education

Vocal re-education consists of a series of sessions carried out, on the one hand, in an office adapted for therapeutic sessions by the Human Communication Therapist, and, on the other hand, at the patient's home (on their own behalf), where the techniques are explained beforehand and which, as the therapy progresses, will be used according to their needs and above all damage.

The exercises presented to the patient by the therapist for work at home have to be performed daily, and to be constant in them. It is recommended that the appropriate time is found, that they are practised for no more than 15 minutes, although depending on the person and their availability, they should be done for five to 10 minutes at different times of the day. If you have to practice these exercises at home, it is specifically recommended that you do them in an empty and quiet space, where you have to concentrate only on these exercises. Similarly, it is not appropriate to perform the exercises specifically before going to sleep, due to the stress that may have occurred during the day, physical fatigue, low cortical tone and even drowsiness, as the benefit will only be to relax to sleep.

Stages of vocal re-education

Re-education consists of three stages, which, when put into practice, are not exactly successive, but are interposed.

The ground (first stage)

This concerns psychomotor control. With training in the practice of relaxation techniques, the patient will learn to control tension, i.e., as the name implies, to relax, and thus be able to manage small amounts of energy.

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The pedestal (second stage)

This stage represents the technique of blowing, as well as the general behaviour in vocal projection, phonatory behaviour, needs of specific physical and mental attitude, such as blowing and abdominal and verticality.

The statue (third stage)

It is in this stage that the vocal exercises are involved. This one is easy to understand, as the patient does not need to understand the previous two stages to understand this one.

It is important to indicate to the patient that it is necessary to distinguish the disposition that he/she should have to the exercises from that which he/she should have in a normal voice, or normal use of the voice.

In the first step, which is the exercise, the focus is on posture, gestures and sensations that should be understood in the elaboration of the exercises, it is very useful to pay attention to details.

In the second step, which is the use, it is very simple, it is to realise at the moment that you are forcing the voice (pay attention to details), when you become aware of this action you have to pause for one or two seconds, sigh, make a gesture to change the posture of the body, or an abdominal murmur is ideal to return to using the voice without thinking about the technique that is being applied.

Vocal hygiene

In vocal hygiene, certain principles must be followed if you want to keep your voice in good condition.

The first point is to moderate the use of the voice when hoarseness is present, because, from experience, when this type of unexpected discomfort appears, it is accompanied by laryngeal irritation, as well as coughing, and in certain cases, this discomfort can occur due to disturbances of emotional origin.

In these cases, vocal restraint must be adopted, i.e., the patient can remain almost mute for a few hours or even days, in short, speaking only when necessary. The way of speaking is modified, moderating the intensity of the tone of voice, compensating with a weaker and clearer articulation. Occasionally the whispering voice is also adapted.

What else should you be aware of for proper vocal hygiene? You should not strain your voice, as this can cause irritation of the larynx and vocal cords, leading to vocal cord disorders. It is worth mentioning that smoking is the first serious risk to our voice, as it can eventually trigger bronchial secretions and chronic oedema of the vocal cords, as well as wear and tear on the quality of the voice. The ingestion of alcohol produces in turn, immediate performance of the voice, thus producing instability and decreased power.

It can also be mentioned that some other laryngeal alterations, due to bad vocal hygiene, are caused by vocal excesses, i.e. shouting, forcing due to the acoustics of the space, prolonged coughing, the bad habit of throat clearing, etc. It is also worth mentioning that sudden changes in temperature and drafts of fresh air (air conditioning) cause a malfunction of the voice and disturbance of the voice.

Relaxation exercises for vocal re-education**Relaxation with eyes open (F. Le Huche, 1994)**

This exercise is not aimed at muscle relaxation, but directly at psychomotor energy control. The patient is progressively led to both relax and move his muscles in a precise and sensible way. This is an exercise of short duration, in which the patient adopts a specific breathing in sighs interrupted by pauses of either long or short duration.

In the pauses mentioned above, the patient must perform localised muscular contraction and relaxation exercises, successively affecting the right hand and foot, the right leg and foot, the left leg and foot, the left hand and arm, and finally the left shoulder, head and right shoulder.

This technique has been adapted by F. Le Huche in a shorter and simpler way, as it had to be subjected to the needs imposed by the dysphonic.

Development of the exercise

The patient should practice this exercise at home once a day, for about five to seven minutes. The time to perform this technique should be chosen very well and carefully, in order to create a habit. It should be done lying down, on a hard surface, such as the floor on a carpet, or on the bed, as long as it is not too soft or tends to sink, and of course, lying down without pillows, thus keeping the body upright. These instructions should be followed or adapted as well as possible, because if you become too relaxed or uncomfortable, you will concentrate on the discomfort or relaxation, leaving aside the real purpose.

Period of adaptation to the horizontal position

During the first moments of the exercise (between 10 seconds and two minutes), the patient begins to become aware of his position. This verifies that he is really lying comfortably on his back and his limbs are balanced with his whole body, resting on the horizontal plane. The heels are not brought together, the length of the feet are not spread apart, the tips of the feet are dropped to either side, as are the knees, which are turned more or less outwards.

The eyes remain open, while looking upwards and slightly forward. The hands are placed on the body itself: one at waist level, the other at chest level, near the collarbone; the choice of hands depends on the patient. The fingers are extended, without exerting force, in a natural state, thus allowing the patient to control the movements of his abdomen and rib cage.

It should be made clear that the patient is not obliged to remain immobile, as forced immobility imposes a lot on relaxation, the point of this technique. So, he is allowed to move. It is even recommended to move an arm, legs, knees etc., to break a possible petrified attitude.

The patient is asked, without disturbing her, to observe her breathing, asking her "is it abdominal, thoracic, both, which one is more predominant? In general, this observation unleashes a little rigidity, and a reinforcement in the breathing that dominates, which, the patient is asked to have a faster rhythm. The following order is given: "don't slow down your breathing, speed it up a little, make sure that this breathing is both thoracic and abdominal, and that it is also easy". Sometimes, it is absolutely necessary to inform about the nature of breathing, relating it to the three variables, which are: rhythm, style and amplitude.

Introduction to sighing

After a brief pause, the patient is asked to take a sigh. It is a fairly wide breath, with the mouth ajar, and thanks to the appropriate position of the lips and tongue, a noisy braking of the air, both on inspiration and expiration. The noise emitted during this practice is called f backwards.

An expiratory noise similar to that of the phoneme "ch", decreasing, followed by a brief respiratory pause, will continue without interruption. It will be at the same time abdominal and thoracic, these being elaborated naturally. With his own hands on his body, the patient will control the abdominal and thoracic walls at exactly the same time, with an easy and free movement.

During the sighing pause, if the patient is working out the sigh correctly, he/she will not need to breathe if the sigh has been performed correctly and satisfactorily, otherwise, he/she will feel the complete absence of breathing. The patient should pay attention not to close his mouth (it remains ajar). If the patient feels the tendency to close his mouth, it tells us that he has not achieved a state of balance or relaxation, which makes it unpleasant.

Contraction - relaxation of the right hand and forearm.

This relaxation exercise is done only once, during the whole elaboration of the exercise. After making the above mentioned sighs, the patient is instructed to start contracting the muscles of the right arm for three seconds.

The patient should be instructed to do this shortly after the sigh, so that the sigh should be light at the beginning and then end abruptly.

This results in a locking of the hand, fist and elbow joints. Only, at the beginning of the exercise there is no movement. It is not really a matter of clenching the fist when tensing, or of extending the fingers, but of doing, in a way, both at the same time.

Contraction - relaxation of the right leg and foot.

The patient is instructed, as before, to contract the muscles of the right leg, beginning shortly after the sigh is finished, lasting also three seconds, and ending abruptly. This is reflected in the stiffness of the foot (without the need to put it on tiptoe) and the stiffness of the knee.

Contraction - relaxation of the left leg and foot.

This time is exactly the same as the contraction-relaxation of the right hand and forearm. It is also followed by several sighs.

Contraction - relaxation of the left hand and forearm

This time is exactly the same as the contraction - relaxation of the right hand and forearm. It is also followed by several sighs.

Lifting the left shoulder.

After a short time of sighing, the patient is asked to imagine that there is a string attached to the left shoulder coming from the ceiling and that someone is pulling it vertically and quietly. The shoulder is lifted as much as possible with the minimum effort, taking care that the middle of the back is not dragged and that there is no rotational movement of the head. The face remains immobile, the jaws do not exert any force, and the rest of the body remains relaxed; breathing does not occur. After three seconds, the thread is cut, and the shoulder falls inert.

Raise your head

A short time after the sigh, the patient is asked to raise his head as if he were going to look at his feet. Only the head and neck should be raised, but not the upper back or shoulders, thus remaining in the horizontal plane. Initially, the glottis is open. Check that there is no movement of the feet, and that the toes are symmetrical to the outside. After three seconds, the patient lowers his head and neck back into the horizontal plane, starting with his neck, followed by the head quickly, but carefully.

Raising the right shoulder.

This exercise is the same as lifting the left shoulder, but should be performed after one or more sighs.

Return to continuous breathing.

This is the final part of the relaxation exercises, and circular travel through one's own body, which has started with the left shoulder, and so finished with the right shoulder. After a short time following the sigh, the patient closes the mouth that has been ajar for the moment, and calmly returns to the usual nasal breathing. This should not be too slow but should be both abdominal and thoracic. Care must be taken to ensure that the patient brings them together adequately and gradually, asking him/her that: "at the end of inspiration, the exhalation can begin, and vice versa".

If on any given occasion, when the patient returns to the habitual breathing, the patient produces a feeling of liberation with regard to the breaths taken previously, this means that he/she has not managed to achieve a state of relaxation and satisfactory sighs, meaning that they are exactly in accordance with his/her respiratory needs despite the obligation to submit to an imposed rhythm (Le Hauche, 1994).

Phonatory murmur

Rhythmic breath (two - eight - four)

This is practised immediately after relaxation with the eyes open, as it requires a completely relaxed and willing attitude on the part of the patient. Its effect can also be a relaxing state.

The hands are placed one on the chest, the other on the abdomen, with the elbows resting gently on the horizontal plane. It is especially important for the patient to be aware of the movements to be made on the abdomen and chest.

Breathing in: two seconds

The patient is asked to swell the abdomen moderately, sucking in a certain amount of air through the mouth in a light, calm and effortless manner. During this time, check that the sternum does not rise, as it normally tends to sink a little during this inspiration, as if drawn downwards by the abdominal suction.

During this suction, an aspiration noise is made, sounding like a backwards "f", thus bringing the lower lip into contact with the upper incisors. The small resistance imposed in this way to the entry of air will allow a better appreciation of the air that has been breathed in, which should be average (so to speak) and not maximal.

Pause: eight seconds

For eight seconds, the individual should effortlessly hold the breath. He should have the impression of suspension of inspiratory movement. An analogous upper thoracic suspension occurs just after the inspiration (often sonorous) produced by the surprise: "Oh!" pronounced on inspiration.

Blow: four seconds

This murmur is an active inspiration that occurs naturally, according to the abdominal type. This means that it requires the intervention of the abdominal girdle controlled by the antagonistic action of the diaphragm. This movement is characterised by a contraction of the abdominal wall associated with the lateral closure of the ribs. There is no descent of the sternum, on the contrary, there is the impression of a slight sternal elevation towards the end of the movement (in four seconds).

The first three seconds.

The murmur must be initiated without abruptness, but in a clear and precise manner thanks to the moderate but visible pressure of the abdominal musculature. It produces a mouth noise similar to the sound of water falling from a distance, like a "ch, ch, ch", maintained regularly and not abruptly for three seconds. It shows that there is a solid articulation and firmly sustained lung pressure.

The fourth second.

At this last second (which is not really about seconds, but about time), the breath strengthens to stop abruptly and makes a noise similar to that of a quarter of a bucket of water thrown on the ground by a person 10 metres away.

The general meaning of this exercise is the economy of energy, the smoothness of the gesture and the general ease of its elaboration. It cannot be performed perfectly if too much energy is used in its execution. It is only necessary to intervene at two moments: at the beginning of the exhalation and at the reinforcement of the exhalation (four seconds). This exercise cannot be proposed from the beginning, as it depends on the case, simpler variants are presented.

Verticality.

First of all, verticality is recognised as a characteristic that differentiates man from the closest animal species. "Man, the vertical animal". In addition, a parallelism can be established between the development of the vertical position and the development of speech in the child (Seeman, Pr, 1965).

Secondly, uprightness is a characteristic that makes it possible to differentiate an individual from some others. One of the following three statements can be made about an individual:

1. It does not go straight. He is slouching. His posture is not firm, he has an asthenic habit.
2. He is stiff, stiff as a stick, he walks very stiff. He has a very rigid posture.
3. He has a good posture. He has poise, ease, he is self-confident, he has no verticality problems.

The asthenic habitus, responds to a series of characteristics which, from bottom to top and in their maximum degree, are the following: feet inwards, prominence of the abdomen, dorsal kyphosis, sunken chest, inexpressive face, among others (Le Hauche, 1967).

The shoulders are well laid back. One can speak of an individual who remains upright, while at the same time being distended, producing an impression of stability.

The patient, placed in front of the mirror and in the most upright position possible without being rigid, is checked to ensure that the axis of his body and head are on the same line. Looking into his eyes, he turns his face slightly to the right, then turns it slightly to the left and then back to the front, repeating these movements two or three more times. The formula of the exercise is as follows:

- Look to the front.
- Face to the right, to the front, to the left, to the front.

Each orientation of the face is held for at least one second, which can be extended to five seconds if necessary. At each stop the subject checks:

1. That the gaze remains directed straight ahead and has not followed the face as it moves.
2. That the shoulders (and the rest of the body) do not move because of a sudden movement of the face.
3. That the axis of the body and head remain on the same line, i.e., that the head has turned correctly on its vertical axis.

Often, at the beginning of the exercise, a tilt of the head over the shoulder or a forward movement of the face is observed.

To find the right position, the patient will use the evocation of the psychological experience that corresponds to each of these positions: looking straight ahead and face forward (thorax in place, pelvis not tilted), means: "what is in front of me interests me and I deal with it effectively".

Looking straight ahead and facing sideways means: "I am interested in what is in front of me, but I don't want to deal with it: it is not my business and I don't want to take any responsibility for it".

Research methodology

The methodological perspective adopted is of a mixed type, being field research of a descriptive and observational type, taking a period of time of nine months for data collection and three months for the analysis of the study. Subsequently, an analysis of the data and results was carried out in order to achieve the objectives already established.

Data collection was based on patients who have been intubated due to complications due to COVID-19 and consequently successfully extubated.

The type of study is non-experimental, descriptive, mixed qualitative and quantitative and field research, through an analysis of measures of central tendency (mean, median and mode) and measures of dispersion (standard deviation), with a total universe of 164 patients, and a sample of 83 patients.

Procedure

Data collection began with the help and support of the books *La Voz* by Hauche and Allali, through the library of the Faculty of Psychology and Human Communication Therapy of the Universidad Juárez del Estado de Durango. This was followed by the study and simplification of information.

Subsequently, we went to the Hospital General 450 of the State of Durango, to the statistics area to request permission for the collection, analysis and study of data on patients extubated by COVID-19. When permission was granted to access the hospital's statistics, they were collected through the MedTzin platform, which allows access to files by their number. They were collected in the rest area of the neurosurgery area on the third floor of the hospital.

Once the information needed to complete the study was available, the following tables were drawn up to simplify the data collected.

Inclusion	Exclusion	Elimination
Patients extubated as a result of COVID-19 alive.	Extubated patients without respiratory or voice alterations.	Intubated patients, who have died.
		Patients who have been extubated and have died.

Table 1

Results

The results obtained from the analysis of the data collection are presented below, presenting the number of patients who were intubated and extubated, these patients are identified by number, age and sex.

Prob. voice	Extubated	Sex	Total files	Prom. Age
18	17	M/H	83	60.25

Table 2

The 83 patient files that have been requested and provided for the study show that, of the 18 people who presented voice problems, 12 are men and six are women, as shown in the table below:

Sex	Voice problems	% total	% Voice problems
H	12	14.63%	66.67%
M	6	7.32%	33.33%
TOTAL	18	21.95%	100%

Table 3

Following the 83 patient records that were attached for this study and allowed for access, 17 were successfully extubated, simplified in the following table:

Sex	Extubated	% total	% Extubated
H	11	13.41%	13.41%
M	6	7.32%	7.32%
TOTAL	17	20.73%	100%

Table 4

In the present study, no intervention was carried out with the patients, only data collection, with which it is proposed to use vocal re-education in these extubated patients.

Conclusions

Based on this information, since none of the patients who had a successful extubation, none of them underwent therapeutic care for voice and breathing problems, since, with invasive mechanical ventilation (IMV), it is very likely to have a voice alteration.

As Urritia, D. mentions, "the intubation process itself generates irritation on the vocal cords and airway oedema. All of this can generate the appearance of dysphonia, once the patient is extubated".

Also, the speech therapist, Zavala, P., comments that, "in relation to the voice, there is a variable impact on communication, especially because the intubation procedure could be associated with laryngotracheal lesions, such as lacerations, ulcers, stenosis, granulomas and vocal cord paralysis. In addition, if the patient is intubated for a prolonged period of time, a tracheostomy may be required, which prevents normal vocal production.

Few people are aware of the damage that all these techniques cause, and this is the area to which they pay the least attention, so they are unaware of vocal rehabilitation or re-education techniques, and not only for this aspect, but also in general.

Having said this, it is proposed to share this information with all those patients who have suffered from COVID - 19, and who have also manifested voice problems unrelated to extubation, since, based on the results, it is considered that the intention to intervene therapeutically in extubated patients is very late or non-existent, in addition to the fact that most of them do not reach the rehabilitation area for attention.

Consequently, vocal re-education is proposed not only to extubated patients, but also to the population that has had problems with voice production and/or voice alterations, for example, to professionals who use their voice as a means of work: teachers, singers, announcers, journalists, public service workers, among others, obtaining the result of better care of the voice, knowing its limits, and not abusing it, thus avoiding it being confused with a laryngeal disease, and being treated appropriately by the therapist in human communication.

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