THE IMPACT OF THE REACTIVITY TO STRESS IN TEACHERS WITH VOICE PROBLEMS

Cecília Gassull [1]
Cori Casanova [2]
Queralt Botey [3]
Miquel Amador [4]

1 Universitat Autònoma de Barcelona. Faculty of Sciences of Education.
2 Universitat Ramon Llull – Blanquerna. Phoniatricien. Department of Logopedics.
3 Voice Therapyst. Psycologist.
4 Universitat Autònoma de Barcelona. Department of Methods.

Cecília Gassull
Universitat Autònoma de Barcelona
Edifici G6 Facultat de Ciències de l'Educació
(08193) Bellaterra
Tel. +34 93 581 16 79/ Fax +34 93 581 32 99
cecilia.gassull@uab.cat

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Abstract

Introduction. One of the objectives aimed in our investigation on *Education of the voice and vocal Health*, leads us, in this stage, to continue inquiring into the existence of a relation between the reactivity to stress and the voice problems in the teaching group. *Materials and methods.* For this, used a sample of 447 individuals amongst future teachers and teachers on active service was used, since they form a population which presents both a high index of voice problems and stress. In order to gather the necessary information for the study we have used the questionnaire VHI-10 (*Voice Handicap Index*) and the test IRE-32 (*Index of Reactivity to stress*). *Results.* The results indicate that those individuals with voice problems have a greater reactivity to stress. In this reactivity it was observed that there are certain items in which the difference is relatively great.. The majority of them regard vegetative signs, that are linked to aspects related to voice emission. *Conclusion*.Reactivity to stress is a useful factor to bear in mind in teachers with voice problems.

Key words: Stress, Reactivity, Occupational Voice, Teachers, VHI, IRE-32.

Introduction

The teaching group is one of the work groups with the highest risk of suffering voice problems [1-6]. Many epidemiological studies highlight this voice reality in teachers [7-9], which worsens when it comes to Primary School teachers. A recent investigation by Munier and Kinsella [10], who analyzed the prevalence of voice problems in teachers, shows that just 20% of them has not suffered voice problems. Moreover, in relation with this type of jobs, teachers attribute their voice problems to their job and there is a higher index of absenteeism for this reason [11].

Although the etiology of voice problems is diverse, it seems that the physical and psycho-emotional variables are the main risk factors [5,12]; Even though the need to speak for many hours [13] at high intensity is also an important factor to take into account.

Together with voice problems, stress is an illness also associated to this group. Teachers attribute its origin to causes such as having to work with little motivated pupils, being assessed by third parties or carrying a heavy workload [14]. Furthermore, they are demanded to speak or sing during long periods in stressful situations with intensity and good voice quality and in environments which favour an inefficient and harmful use of the voice [15-16].

In jobs such as teaching, which require an efficient and healthy voice emission, important elements come into play, such as position, degree of muscle intensity [17-18], breathing, laryngeal operation or a good use of the resonating cavities for an ideal amplification of the voice. This way, an imbalance in these elements could be affecting the voice emission negatively.

The stress system coordinates the general stress response, which occurs when a stressor agent of any type exceeds a threshold [19]. We know that stress is a useful response as long as it is adequate to the causing stimulus and does not overrule the control and response capacities. So, the organism is prepared to react before situations of diverse nature, but the damage to physical or psychic health is produced when the factors that induce stress have a marked intensity,

frequency and duration which exceed the mechanisms that the subject uses to face them [20].

For many decades studies have been carried out in order to understand how stress affects health and illnesses. [21-22] These studies show how the emotional reactions or stress present correlations with different cardiovascular [23], circulatory [24] disorders, amongst others.

González de Rivera [22] calls the individual way of reacting before possible stressful situations “Reactivity to stress” and defines it as a group of response norms (cognitive, behavioural, emotional, vegetative) which determine the effects of stress external factors.

The study carried out by Demmink-Geertman and Dejonckere [25-26] seems interesting to us. They studied the relation between non-organic dysphonia and the dysfunction subjective experience of the autonomic nervous system (neurovegetative lability) and got to the conclusion that subjects with non-organic dysphonia communicate significantly more complaints or symptoms related to a possible dysfunction of the autonomic nervous system than subjects with no voice problems.

In the field of investigation of the relation between stress and voice problems, we find some interesting studies which suggest that individuals with functional dysphonia have got personality features or temperament which can predispose them to suffering voice problems [27]. In a similar line of investigation but with a wider range of variables of study and of types of voice pathology, Roy et. al [28] observe how patients with functional dysphonia and vocal nodule, apart from having specific personality features, showed high reactivity to stress, compared to patients with spastic dysphonia or unilateral vocal fold paralysis. Van Mersbergen [29] finds similar results with patients diagnosed with functional dysphonia who show the same level of reactivity to stress as those individuals who suffer social anxiety.

Our aim is to check if, in the teaching group, the way to react before stress is closely related to the perception of voice problems.

Method

In order to gather data we have used a sample of n=447, which is made of 252 students and 195 teachers. This selection has been carried out in the following way: Teacher Training students of the courses 2006-2007 and 2007-2008 who study the subject *Voice Education* in the UAB (Universitat Autònoma de Barcelona) and teachers from Nursery and Primary Education schools in Barcelona who work with children aged between 3 and 11.

We used the VHI-10 [30] in order to discriminate between those individuals with voice problems and those who do not perceive voice difficulties. A punctuation above 9 (VHI) indicated the existence of a voice problem. In order to assess the individual response tendency before stressful situations we have used the test IRE-32 [31,32] which measures the group of usual norms of cognitive, emotional, vegetative and behavioural response before situations perceived as potentially damaging, dangerous or unpleasant, from a Likert scale of 5 points (also from 0 to 4). This test allows to analyse the total IRE or the four response norms separately (vegetative IRE, emotional IRE, cognitive IRE, behavioural IRE). If the categorized punctuations are below 0,6, the reactivity to stress is considered to be low, if the punctuations go from 0,6 to 1 the reactivity to stress is considered to be high but not worrying, and if it is above 1, the reactivity to stress is considered to be too high. We would like to advise that, in order to show the global difference of intensity in the responses between individuals with or without voice problems, in one of the analysis we have worked with real punctuations (from 0 to 138), obtained from the sum of all the responses given.

The data was analysed using the statistical program SPSS (V15). For continuous outcome variables that were normally distributed, Student t - test of the equality of averages was used. For discrete outcome variables Chi-square tests were used. The significance level was set at $p \leq 0.05$.

Results

The data shows that there is an important percentage of participants with voice problems. This rate is significantly higher in the teaching group ($p = 0.031$) (Table 1).

Insert Table 1 about here

The scores of the IRE-32 indicate a significantly ($p < 0.001$, t-test) higher reactivity to stress in individuals (teachers & controls) with voice problems (mean=44.8, SD=13.51), compared with those without voice problems (mean= 33.7, SD= 14.85). This tendency is also found in both the teachers and controls (Table 2).

Insert Table 2 about here

Figure 1 shows the relation of voice problems and IRE scores in students and teachers. A relatively great percentage of students and teachers who perceive voice problems showed a reactivity to stress that is too high is found, compared to students and teachers without voice problems. Moreover, there is an almost inexistent or very low proportion of individuals with voice problems and low reactivity to stress.

Insert figure 1 about here

Since reporting voice problems and IRE scores are similar in students and teachers the following analysis was carried out with the students and teachers in one group. Significant differences in all the response norms to the IRE (vegetative, emotional, cognitive and behavioral) between individuals with and without voice problems was found (Table 3).

Insert Table 3 about here

The test *t-Student* was applied in order to observe whether in the group with and without voice problems certain items with high reactivity appear. Once the results have been analysed, we have found that 17 of them are significantly

more present in the group with voice problems (table 4). It is worth mentioning that 10 of these 17 items (IRE4, IRE5, IRE10, IRE12, IRE13, IRE14, IRE17, IRE19, IRE21, IRE22) refer to vegetative responses.

Insert Table 4 about here

Discussion

According to the objectives set out in this work, the results obtained provide us with indications that lead us to the fact that extreme reactivity to stress constitutes a factor which is significantly present in the group of individuals with voice problems.

The fact of presenting a high reactivity before stress does not entail having voice problems. But data of the pertinent study show that individuals who suffer of voice problems tend to have a reactivity which is too high before situations which they perceive as stressful.

It was also observed that individuals with voice problems present higher reactivity levels in the four types of response of the IRE-32: vegetative, emotional, cognitive and behavioral. But it can be concluded that vegetative signs are more present in individuals with voice problems. This statement is derived from the 17 items found as the most discriminant in the population with voice problems. From these 17 items, 10 are of the vegetative type. These results are in accordance with those of Demmink-Geertman and Dejonckere, that show a relation between vocal disfunction and neurovegetative symptomatology. [26]

As a final conclusion, it may be stated that the results of the pertinent study indicate that individuals with a high Index of Reactivity to Stress (IRE) present higher vulnerability to suffering of voice problems. In this sense we would agree with Kooijman, de Jong, et al. [12] about the importance of considering the psycho-emotional factors in the diagnosis and treatment of voice.

The way responses of the vegetative type can affect voice production and consequently generate voice problems remains unresolved. This field should be further explored.

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